# ABSTRACTS FROM THE SCIENTIFIC AND TECHNICAL PRESS.

*Issued by the*

*Directorates of Scientific Research and Technical Development, Air Ministry.*

*(Prepared by R.T.P.3.)*

No. 108. January, 1943.

Notices and abstracts from the Scientific and Technical Press are prepared primarily for the information of Scientific and Technical Staffs. Particular attention is paid to the work carried out in foreign countries, on the assumption that the more accessible British work (for example that published by the Aeronautical Research Committee) is already known to these Staffs.

Requests from scientific and technical staffs for further information of translations should be addressed to R.T.P.3, Ministry of Aircraft Production, and not to the Royal Aeronautical Society.

Only a limited number of the articles quoted from foreign journals are translated and usually only the *original* can be supplied on loan. If, however, translation is required, application should be made in writing to R.T.P.3, the requests being considered in accordance with existing facilities.

Note.—As far as possible, the country of origin quoted in the items refers to the original source.

*Some Definite Integrals Occurring in Aerodynamics.* (H. Bateman, Kármán's Anniversary Volume Applied Mechanics, pp. 1-7.) (Reprint available.) (108/1 U.S.A.)

An integral used by Glauert in his numerical study of a wing in a free jet of circular section is evaluated in terms of the generalized hypergeometric function and is found to belong to a class of integrals involving the hypergeometric function that can be expressed in a similar way. A proof is given of Glauert's reciprocal relation.

The integrals used by Squire in his numerical work are derived in a new way and are found to belong to a class of integrals involving Legendre functions of the second kind.

*On a Method for the Solution of Boundary-Value Problems.* (R. Courant, Kármán's Anniversary Volume Applied Mechanics, pp. 189-194.) (Reprint available.) (108/2 U.S.A.)

Instead of the Rayleigh-Ritz method for variational problems another method, initiated by Hadamard, is considered, in which a function arbitrarily chosen at the start is continuously or stepwise corrected along the gradient of the functional to be minimized. The procedure converges to the desired solution in certain classes of problems which include problems of conformal mapping of simply—or multiply—connected domains.

*On Lubrication Flow with Period Distribution Between Prescribed Boundaries.* (H. Reissner, Kármán's Anniversary Volume of Applied Mechanics, pp. 310-316.) (Reprint available.) (108/3 U.S.A.)

The viscous flow in the narrow gap between a Michell wedge-shaped pad and the counter surface of a bearing has been treated approximately by the Reynolds equation of lubrication, and it has further been shown that a more exact theory leads to the same result in the limit for a very small wedge angle.

Yet a certain doubt remains about the question of the boundary conditions at the entrance and the exit of the flow, because pressure values prescribed at the ends of the gap have always been assumed for such conditions. But at both ends appreciable velocities and even an eddying motion are certainly produced, so that the pressures (or more exactly the principal stresses) cannot give the decisive condition.

This consideration has induced the author to investigate the flow over a periodic arrangement of wedge-shaped pads preferably following each other with continuous curvature. The other purpose for such an arrangement is to give a theory for a flow avoiding eddying spaces, as a preparation for attempts to improve the Michell bearing.

*The Ideal Performance of Curved-Lattice Fans.* (F. L. Wattendorf, Kármán's Anniversary Volume of Applied Mechanics, pp. 285-292.) (Reprint available.) (108/4 U.S.A.)

A curved-lattice fan is defined as a fan having curved blades with sufficiently close spacing to exert a predominant guiding action on the fluid. The present study analyzes the ideal case of perfect guiding in a frictionless flow. Simple expressions are developed for computing ideal pressure-quantity curves for fans of this type. The influence of factors such as pressure coefficient and hub ratio on the performance curves are studied separately.

Although the analysis is intended as being qualitative in nature, good agreement of the theory with experimental results on a fan of moderately high chord/spacing ratio gives hope of further useful application to practical fan problems.

*On the Permissible Roughness in the Laminar Boundary Layer.* (I. Tani, R. Hama and S. Mituisi, Rept. No. 199, Aero. Res. Inst., Tokyo, Oct., 1940, pp. 419-428.) (108/5 Japan.)

Experiments were carried out on the transition from laminar to turbulent flow in the boundary layer of a flat plate and a symmetrical aerofoil. The transition was initiated by a fine wire in contact with the surface and perpendicular to the flow and detected by the sudden change in total pressure of a small pitot in contact with the plate at some distance behind the wire. For small values of the thickness $k$ of the excrescence, the shearing stress $\tau_0$ for laminar flow is given by

$$\tau_0 = \mu\,(u_k/k)$$

where (Eng.) $u_k$ = velocity of flow at top of excrescence.

Introducing the so-called friction velocity $v_F = (\tau_0/\rho)^{\frac{1}{2}}$, Goldstein has suggested that the critical value of $k$ (*i.e.*, maximum permissible value before breakdown of laminar flow) is given by

$$\frac{kv_F}{\gamma} < 7$$

From the author's experiments, however, it appears that stability of the laminar layer is maintained provided

$$\frac{kv_F}{\mu} > 13 \text{ (flat plate)}$$

$$\text{or} > 15 \text{ (symmetrical aerofoil)}$$

https://doi.org/10.1017/S0368393100141033 Published online by Cambridge University Press

Taking the lower value to be on the safe side the permissible roughness can be expressed in the form:—

$$\frac{k}{t}=\frac{13}{A}\left(\frac{Vt}{\gamma}\right)^{-3/4}$$

where $t$ = chord

$V$ = velocity of undisturbed flow

$$A=\frac{(Vt/\gamma)^{1/4}(\tau_0/\rho)^{1/2}}{V}$$

" $A$ " will depend on shape of body as well as position of excrescence.

*Experiments on Rows of Aerofoils Under Conditions of Retarded Flow.* (Y. Shimoyama, Memoirs of the Faculty of Engineering, Imperial University, Japan, Vol. 8, No. 4, 1934, pp. 281-329.) (108/6 Japan.)

The experiments were carried out on grids of 5, 7 and 9 aerofoils respectively, placed at the end of a square nozzle of 53 cm. side in such a way that the incident air stream underwent a retardation, corresponding to an increase in pressure (axial flow compressor). The central aerofoil in the series was provided with pressure holes, the lift and drag coefficients being determined from pressure surveys at an air speed of about 30 m./sec.

The results are presented in a series of diagrams for various values of $t/l$, the coefficients being plotted in each case as a function of the angle of attack $\alpha$ with $\theta$ as parameter where

$\alpha$ = angle between chord and mean velocity vector between entry and discharge.
$\theta$ = angle between chord and direction of row.
$l$ = chord length = const. = 10 cm.
$t$ = spacing in grid.

The aerofoils were of Gottingen 549 section and the tests covered the range

$\alpha$ $-6$ to $+10°$
$t/l$ .75 to 2
$\theta$ 10° to 30°.

In addition, tests were carried out on a single aerofoil giving lift and drag as a function of $\alpha$ with $t/l=\infty$.

The following are the principal conclusions:—

(1) Max. lift coefficient under retarded flow is much smaller in cascade than when isolated.

It diminishes as the spacing becomes closer ($t/l$ decrease) and also depends on $\theta$.

(2) The theoretical correction to the lift coefficient valid for a row of flat plates cannot be used for the present series of aerofoils.

(3) The inclination of the lift coefficient curve agrees well with the theoretical value in the neighbourhood of $\theta=15°$.

(4) The drag coefficient for the cascade is also larger than that of the isolated aerofoils and varies with $t/l$ and $\theta$.

(5) The variation of angle of attack for zero lift can be calculated approximately by the method of doublets. The results are in satisfactory agreement with experiment.

*Elliptic Tunnel-Wall Corrections on Drag and Stall.* (J. G. Gavin and R. W. Hensel, J. Aeron. Sci., Vol. 9, No. 14, Deecember, 1942, pp. 533-537.) (108/7 U.S.A.)

The tunnel-wall effects on drag and stall, given by the usual simple corrections, are not adequate when the span-diameter ratio is high or when the spanwise lift distribution varies considerably from elliptical. In order to determine more exact interference corrections, especially for elliptic throat tunnels of closed section, the upwash induced by the tunnel walls on the major axis, due first to the presence of lifting lines of different span lengths and then to the presence of typical wing distributions built up from these lifting lines to simulate actual wings, is computed for a number of wing distributions and spans. All the calculations are for wings whose aspect ratio is eight, and all are based on the constants of the Wright Brothers elliptic throat wind tunnel at the Massachusetts Institute of Technology.

The magnitude of these corrections is found to vary inversely with the taper ratio of the wing, the corrections being less for a highly tapered wing and more for a rectangular wing of the same span and aspect ratio. For those cases where the wing tips lie outside the foci of the throat section, the variation of the induced angle of attack along the span is no longer negligible at high lift coefficients. Its geometric effect is to cause an apparent washin angle toward the wing tip. The induced drag corrections have minimum values when the wing tips are at or near the foci of the tunnel for all usual lift distributions along the span. As the wing tips approach the tunnel wall, both the induced drag corrections and the angles of apparent washin or of apparent twist increase rapidly.

*The New Training School for Sailing Flight* (" *Ith* "). (Luftwelt, Vol. 9, No. 15, 1/8/42, pp. 298-299.) (108/8 Germany.)

An account is given of the official opening on July 8th, 1942, of the " Ith " Training School for sailing flight. This school, situated in the hill country of the River Weser, was established more than 10 years ago and is now one of the most important training centres for gliding in Germany. The new building can accommodate as many as 50 gliders and provides excellent living quarters for some 120 flying recruits of the National Socialist Flying Corps (N.S.F.K.). There are lecture-rooms and excellently equipped workshops offering every facility for experimental work. Under war conditions the school serves mainly as a pre-military training centre for those who will subsequently enlist in the German Air Force as pilots.

*Ground Vibration Tests.* (C. D. Pengelley, J. Aeron. Sci., Vol. 9, No. 3, Nov., 1942, pp. 481-490.) (108/9 U.S.A.)

The dynamics of a rigid body having two degrees of freedom is presented. The complete solutions for nodal points and coupled frequences are obtained. The general solution for the nodal positions is presented in graphic form, which provides not only a physical picture of any system but also a rapid means of evaluating the position of the nodes. Charts have been prepared from which the uncoupled frequencies, as required in flutter analysis, may be rapidly evaluated from data observed during vibration tests. Neglect of this item may produce an unconservative error of 20 per cent. in the calculated flutter speed.

A theoretical analysis is made of the factors affecting the power and unbalance required to conduct vibration tests. It is shown that for a given amplitude the power absorbed by a wing is roughly independent of aeroplane size; however, for any given aeroplane it is from two to sixteen times greater at torsional than bending resonance. At torsional resonance, with 1/10th in. total motion of the trailing edge, a conventional wing absorbs about 0.0134 h.p. Thus, the theoretical power required is negligible, and the choice of a suitable motor depends upon the friction horsepower absorbed by the test equipment.

Numerical examples are presented to illustrate the use of all principle equations and charts.

A discussion is given of the new Curtiss-Wright Universal Vibrator, outlining its major points of interest.

*Determination of Aeroplane Critical Altitude by Flight Tests.* (L. C. Miller, J. Aeron. Sci., Vol. 9, No. 3, Nov., 1942, pp. 491-496.) (108/10 U.S.A.)

The aeroplane critical altitude is the highest altitude in standard atmosphere at which the engine, as installed and as effected by ram and carburettor air temperature rise, will deliver its rated b.h.p. at its rated r.p.m.

The determination of this critical altitude has become of considerable importance during the last four or five years. The method presented in this paper has been developed around a practical problem on a specific aeroplane. By use of this method it has been possible to establish the high speed of a type aeroplane so that it may be checked from flights of other aeroplanes of the type and under varying atmospheric conditions. The problem applies to an installation using a two-speed single-stage mechanical supercharger. The problem becomes more complicated when two-stage supercharging and exhaust turbosupercharging are used. Some of the factors relating to the latter type of installation are indicated.

The particular benefit gained from the determination of aeroplane critical altitude is the establishment of the aeroplane high speed and the establishment of the increase of high speed effected by careful design of the carburettor air scoop for the attainment of the highest possible ram due to the dynamic pressure of the air entering the carburettor scoop.

*Vector Solution of the Three-Degree Case of Wing Bending, Wing Torsion and Aileron Flutter.* (L. Arnold, J. Aeron. Sci., Vol. 9, No. 3, Nov., 1942, pp. 497-500.) (108/11 U.S.A.)

It has been noticed that the two-degree analysis based on Théordorsen's theory is inadequate for the accurate determination of the critical flutter speeds of an oscillating aerofoil-flap system. Various graphic methods of solution have been devised to eliminate the computations required in the solutions of the various two-degree cases, but until now no simplified solution has been developed for the three-degree case. Though the method of solution of the three-degree case is straightforward and routine in character, the actual inherent complexity of the computations involved is such that it warrants simplified vector method of solution.

This solution is based on the fact that the components of the vibratory determinant are complex in form (real part plus an imaginary part) and therefore can be represented by a vector in the complex plane. For a given set of physical parameters the terms of the determinant are functions of the auxiliary flutter parameter $k=(\omega b/V)$ and $\omega$ ($\omega$ is the flutter frequency, $b$ the aerofoil semichord, and $V$ the flutter speed), while the remaining terms are functions only of $k$. Expansion of the determinant results in terms that are functions of $k$ and $\omega$ and terms that are functions only of $k$. Since both of these groups are complex in form, they can still be represented by vectors.

Transposing these vectors, one on either side of the equality sign, the flutter speeds will be found by determining those values of $k$ and $\omega$ for which the two vectors are equal.

*Plywood in Aircraft Construction.* (G. A. Allward, Annual Meeting of the A.S.M.E., Nov. 30th-Dec. 4th, 1942, Preprint No. 45.) (108/12 U.S.A.)

Shortage of aluminium has forced aircraft manufacturers to turn to alternative materials, and since plastics are as yet unsuitable for structural parts, a return to wood in aircraft construction is clearly indicated. Unfortunately, the aircraft wood worker has by now almost completely disappeared from the industry and whilst a wealth of information is available covering metal structures, comparable information on wood is extremely meagre. As a result the conversion task is very formidable, but it is hoped that with the extra steps now being taken, this lack of information will be remedied in the near future. Is is, however, already clearly apparent that resin bonded plywood offers the best form of wood for aircraft structure of the shell type. On account of its low density the effective shell thickness (i.e. total cross-sectional area, skin plus stringers, divided by circumference of body) of the plywood structure may amount to four or five times that of the dural shell of the same weight. A dural compression panel is normally designed to support about 1,500 lb. p.s.i. (Limit is given by panel buckling.) The plywood panel of same strength-weight ratio should therefore withstand about 4,000 lb. p.s.i. for a thickness of about .2 in. Experiment shows that this needs a stringer spacing of about 8 in., but for mass production purposes it may be advisable to increase this spacing to use a slightly thicker skin ($t = .3$ in. increases the necessary spacing to 45 in.). This increase in thickness has the further advantage that the torsional stiffness of the shell is increased very markedly. Plywood is easily formed in a steam chamber so that an entire fuselage covering can be produced as two half shells. In the case of the Clark Model 46 aeroplane, only 18 man hours are required to fabricate one half shell (fuselage 20 ft. long, 6 ft. diameter). The plywood shell elements of a wooden structure are thus well adapted for mass production besides possessing the attribute of an efficient structural material.

In converting structural parts from metal to wood, experience has shown that properly designed parts will weigh less than the metal parts they replace and in most cases possess superior stiffness.

A further advantage is the absence of corrosion, whilst satisfactory surface finishes for weather protection are already available.

*Air Pick-up Operations.* (J. G. Gray, Mech. Eng., Vol. 62, No. 4, April, 1940, pp. 283-286.) (108/13 U.S.A.)

The pick-up system developed by All-American Aviation Inc. and utilised by the United States Post Office is described. The equipment consists of two steel poles, 30 ft. high set 60 ft. apart. A transfer rope to which the pick-up container is attached is suspended horizontally between the poles, the container of 60 lb. capacity resting at the centre. The pick-up mechanism installed in the plane consists of a manually operated winch provided with a brake and ratchet control together with an air-oil shock absorber. The pick-up cable is 55 ft. long and has a four-fingered grapple weighing 8 lb. at its lower end. In making a pick-up, the plane passes the masts at an altitude of about 60 ft., with the cable trailing the grapple about 10 to 25 ft. above the ground when it strikes the transfer ropes. The pick-up contained is attached to the transfer rope by a special energy absorbing device which slides gradually along the rope and giving the container about 30 ft. in which to accelerate. This is the essential part of the mechanism, since it renders possible the installation of a relatively simple subsidiary shock absorber in the plane.

Pick-ups are carried out at about 110-125 m.p.h., and over 13,000 pick-ups have been carried out successfully during seven months' operation.

Usually delivery is combined with pick-up, the delivery container trailing behind the grapple on a separate rope.

Night operation presents no special difficulties. It is stated that the necessary ground equipment costs less than 200 dollars and that the complete outfit comes to less than 2,000 dollars. Photographs give details of the method of rope suspension employed.

*Cargo Glider Pick-up.* (R. C. Du Pont, 63rd Annual Meeting of the A.S.M.E., 2/12/42, Preprint No. 105.) (108/14 U.S.A.)

The Air Mail Pick-up service was started by the American Post Office Department in 1939 and has now been placed on a permanent basis by the Civil Aeronautics Board. The equipment is designed for dead weight loads of 50 lb., but loads of the order of 100 lb. have been successfully handled and equipment now in military use can pick up much heavier loads.

Since short hauls seem to offer the best field for cargo glider operation, a similar method of pick-up becomes most attractive, since it will enable a high average speed to be maintained between the terminals and expensive runways will only be needed at main ports, where the tug lands.

Experience in mail pick-up operation has shown that such pick-ups can be carried out at speeds substantially above the cruising speed, and glider pick-up experiments have already demonstrated that this will also apply to the tug. In recent tests eight consecutive glider pick-ups were made at intervals of every four minutes, using the same glider and pick-up tug.

The author gives some figures on the relative cost of transport by single aircraft and for the case when the load is distributed over the tug and a number of gliders.

It is, of course, obvious that carrying all the load inside the tug must be more efficient from the point of view of drag alone, provided of course that a sufficiently large aircraft is available. The load balance of such machines requires, however, careful consideration and bulky packages may present serious stowage difficulties. Load distribution is easier on the glider train and the glider can be designed specially to take bulky goods.

The main advantage of the glider train, however, is the fact that the load can be dropped on the way, landing on quite small fields.

If a fresh glider can be picked up, we have a flexible cargo transport needing only inexpensive ground equipment.

*New Developments in Simplified Aircraft Control.* (R. H. Upson, J. Aeron. Sci., Vol. 9, No. 14, December, 1942, pp. 515-520 and 548.) (108/15 U.S.A.)

Problems of control are presented from a standpoint of simple operation rather than mere mechanical simplicity. Of first importance is the elimination of inconsistent or abnormal behaviour in which spinning is classed. The influence of wing and engine position is discussed, and several advantages of an automobile-type wheel arrangement are brought out.

A primary control, in which flaps are co-ordinated with elevator and rudder with ailerons, is advocated. In a possible supplementary pedal control, ground brakes are co-ordinated with air drag obtained by opposite deflection of two rudder surfaces.

Special problems, considered from a standpoint of simplified control, include stability against overturning on the ground, inertia loads on the wing, spiral stability, and control requirements for following a compass course.

The ideal aeroplane for private flying is described as being: outstanding in vision, incapable of spinning, comparable with an automobile in simplicity of control, yet with unquestioned superiority of cross-country performance.

*Proportioning a "Canard" Aeroplane for Longitudinal Stability and Safety Against Stall.* (J. V. Foa, J. Aeron. Sci., Vol. 9, No. 14, December, 1942, pp. 523-528.) (108/16 U.S.A.)

The conditions for static longitudinal stability and controllability and for safety against stall of a Canard-type aeroplane are investigated.

It is found that the designer's freedom of initiative in proportioning a Canard is restricted in very definite ways. The fact that some of these restrictions have probably not been entirely known may serve to explain some of the failures of the past.

The rules that must be followed in order to secure longitudinal stability and controllability and safety against stall are determined for both the conditions of power-off and power-on, whether the high-lift devices are operating or not.

High-lift devices on the tail only, as they have been used in two recent Canards, are found to be dangerous, unless the range of the allowable e.g. locations is greatly reduced. The use of tail high-lift devices when the wing is equipped with flaps is recommended, but it is found that the wing and tail high-lift devices must be operated in conjunction with each other and under a single control. The relation that must exist between their deflections is established.

The procedures for the selection or determination of the aerofoil section, aspect ratio and area of the tail surface, tail length and angle of setting of the stabilizer are indicated.

It is felt that the tail-first aeroplane still deserves the earnest attention of designers.

*Measurement of Aero Engine Torque on High Altitude Test Benches and in Flight.* (C. R. Himmler, Z.V.D.I., Vol. 84, No. 26, 29/6/40, pp. 445-452.) (R.T.P. Translation No. 1,709.) (108/17 Germany.)

The DVL high altitude test benches both for air and liquid cooled engines are described.

The benches follow the normal procedure of limiting altitude conditions to the intake and exhaust, the outside of the engine remaining under normal atmospheric condition. No fundamental objection can be raised to this for liquid cooled engines. In the case of air-cooled cylinders, however, both reduction in the density and temperature of the cooling air would be desirable for more accurate correlation between ground tests and altitude performance. In view, however, of the large quantities of cooling air required, this presents great difficulties and although incorporated in the high altitude test benches of the Fiat Works (Italy) the extra cost and complication is not considered worth while by the author. The DVL test benches utilize coupled hydraulic and electric dynamometers. By a suitable division of the lead between these two types, any desired speed-torque characteristic of the brake can be achieved. At the same time, by providing the electrical dynamometer with Leonard Control, constant speed operation can be assured. For routine testing, the electrical equipment need only be designed for one-third of the total load, the remainder being absorbed hydraulically. This leads to a considerable reduction in the cost of the equipment.

The test benches described appear to have a capacity of about 1,200 h.p. at simulated altitudes up to 24,000 ft. It is interesting to note that provision can be made for testing two liquid power plants simultaneously on the same test bench (attachment at opposite ends of brake).

In the case of air cooled cylinders, it is stated that a considerable saving in cooling fan power can be effected by providing for an increased air density at a reduced speed.

After describing some characteristic performance curves obtained with these test beds, the author turns to the alternative method of measuring the torque in flight. Such instruments may have either electrical or mechanical recording. A representative type of the former class has been developed by Muir at the R.A.E. and depends on recording the deformation of a spring element by the corresponding change in magnetic induction (so called air gap method).

Mechanical recording is employed by the DVL torquemeter; whilst the Pratt and Whitney instrument (much used in the U.S.A.) employs a hydraulic transmission which gives continuous indication on a pressure gauge in the cockpit.

The calibration of all these torquemeters is rather uncertain and absolute measurements are thus in doubt. Even relative measurement, however, forms a valuable extension of the work done on the high altitude test bench. The author expresses the hope that in due course a reliable instrument for routine flight testing of normal power plants will be developed.

An extensive bibliography (49 items) is given.

(See also by the same author: "Test benches for altitude investigation," R.T.P., Trans., No. 1068; ditto, with special reference to DVL distant reading instruments, R.T.P., Trans., No. 1067.)

*Rating Supercharged Engines on the Basis of the Mean Temperature of the Cycle.* (Ralph Miller, A.S.M.E., Dec. (1942), Meeting. Preprint No. 39.) (108/19 U.S.A.)

The author analyzes the temperature conditions of non-supercharged and supercharged Diesel engines and bases the work on the assumption that the capacity of a prime mover which converts heat into work is limited by the temperatures to which its mechanism is subjected in the process. The exhaust-gas turbine used in the Buchi supercharging system may not be operated above 1020 F. gas temperature. It is evident that the Diesel engine likewise reaches a limiting gas temperature as the load is increased. It is demonstrated that engines supercharged with blowers, having an adiabatic efficiency of about 75 per cent. and operating without air cooling, cannot be loaded above 140 per cent. of the brake horse-power of the naturally aspirated engine without exceeding its temperatures or maximum pressures. The paper further develops the importance of removing the hot clearance gases. With a clearance volume of 8 per cent., the indicated horse-power is increased 18 per cent. with no supercharging, by removing the clearance gases only. The capacity of Otto-cycle engines with large clearance volumes and high residual-gas temperatures would be increased considerably more than 18 per cent. by the scavenging method described.

*Effect of Altitude on Knock Rating in C.F.R. Engines.* (D. B. Brooks, Bur. of Stands., J. Res., Vol. 28, No. 6, June, 1942, pp. 713-734.) (108/20 U.S.A.)

Knock ratings made at altitude have shown systematic differences from ratings made at sea level, on some fuel types. Altitude-chamber tests showed that complete agreement could be obtained if tests were made at uniform knock intensity, and that uniform knock intensity was obtained when the cylinder clearance volume was reduced in linear relation to air pressure. From these tests, equations are developed to relate clearance volume for standard knock intensity to air pressure and to octane number for the ASTM Motor and the CFR Research Methods of knock rating. Equations are also developed to relate octane-number requirement to air pressure, and these are shown to agree with road-test data.

It appears that:—

1. The micrometer setting giving constant knock intensity is a linear function of air pressure, the derivative of this function being invariant with octane number and being 0.030 in. per in. Hg for the ASTM Motor Method and 0.020 in. per in. Hg for the CFR Research Method.

2. The effect on knock intensity of a change in volumetric efficiency caused by change of venturi size or other restriction can be compensated by a change of micrometer setting, the amount of this change being the same at all altitudes and all octane numbers.

3. For both test methods, the micrometer setting for standard knock intensity is a direct polynomial function of the octane number, within experimental error.

4. The functions relating octane-number requirement of CFR engines to altitude are derivable from the guide curves, and appear to be of general applicability.

*The Intrinsic Theory of Elastic Shells and Plates.* (J. L. Synge, W. Z. Chien, Kármán's Anniversary Volume of Applied Mechanics, pp. 103-120.) (Reprint available.) (108/21 U.S.A.)

The various approximations used in the theory of the equilibrium of thin shells and plates are confusing. The purpose of the authors is to systematize the theory by developing a basic exact theory into which the various approximations may be fitted. The present contribution is devoted to setting up the six microscopic equations of statical equilibrium to tensor notation, and throwing the microscopic equations of elastic equilibrium and compatibility into a suitable form. All emperical assumptions are avoided and the theory is exact. Approximations will be treated in a later paper.

*Predicting Stiffness and Stiffened Panel Crippling Stresses.* (A. B. Crockett, J. Aeron. Sci., Vol. 9, No. 3, Nov., 1942, pp. 501-509.) (108/22 U.S.A.)

An empirical method is presented for predicting the crippling stress at $L/\rho < 20$ of 24 S-T Alclad bent-up sheet stiffeners, 24 S-RT Alclad bent-up sheet stiffeners, and 24 S-T· extruded stiffeners acting alone or in conjunction with 24 S-T Alclad sheet as a panel. $L$=length of stiffener or panel in., $\rho$=radius of gyration of stiffener alone about an axis parallel to sheet, in. It is also shown that predicted column curves may be constructed by drawing a straight line tangent to the Euler column curve (fixity constant $c=1.5$) through the predicted crippling stress at $L/\rho=20$ (except through $L/\rho=40$ for extrusion stiffened panels); the predicted stress at $L/\rho=20$ (or 40) locates the horizontal cut-off for the section of the column curve with $L/\rho \nless 20$ (or 40).

The general method, which consists of summing the crippling loads of the component elements of the stiffener and then dividing by the summation of the elemental areas to obtain the crippling stress, is discussed in several texts on airplane structural analysis; however, enough test data have not been available heretofore to establish general empirical curves for predicting the strength of any stiffener or stiffened panel of reasonable proportions.

*Rational Analysis of Tension Field Beams.* (H. W. Sibert, J. Aeron. Sci., Vol. 9, No. 3, Nov., 1942, pp. 510-514.) (108/23 U.S.A.)

The commonly accepted theory of tension-field beams was first given by Wagner and was later summarized by Kuhn. Wagner's theory is based upon the assumption that the force in each flange of a tension-field beam is in the direction of the flange. It will be shown later that Wagner's analysis gives the correct solution for a particular type of beam of constant cross section. For all other beams his analysis will give erroneous results.

Wagner's fundamental assumption is the result of an attempt to simplify the problem of the bending of a metal wing by assigning different functions to the different parts of the wing—namely, the bending moment is to be resisted by the flange material and the vertical shear by the shear web in conjunction with the vertical components of the forces in the flanges. In this paper the wing is considered as a whole and the stresses in the tension-field shear web are determined by a method similar to that for finding the longitudinal shear stresses in a beam with a shear resistant web. Approximate formulas are then developed which can be applied to beams of either constant or variable cross section.

*Application of Maclaurin Series to Beams Under Simultaneous Transverse and Axial Loading.* (A. G. Strandhagen, J. Aeron. Sci., Vol. 9, No. 14, December, 1942, pp. 529-532.) (108/26 U.S.A.)

The method of determining the elastic line of columns and struts is, to start with, the fundamental equation $(d^2y/dx^2)=-M/EI$, and by two quadratures the deflection curve $y=f(x)$ is obtained. Most of the current methods carry this procedure through in some manner or other. While these methods are practical, it can be shown that in many cases other methods are shorter. As an illustration, application of the Maclaurin formula in solving for the deflection curve of beams was shown by Hetenyi. In this paper the writer extends the Maclaurin formula, which developed a function of real variable, say $x$, into a polynomial plus a remainder, to an infinite series known as the Maclaurin series, which expresses the function as a power series provided the remainder after $n$ terms converges toward $O$ as $n$ become infinite.

Use of the Maclaurin series simplifies the solution of many problems and therefore should be of interest to engineers.

There is no approximation involved in this procedure since all terms are included, as will be evident from the expansion in the illustrative examples.

*Notes on Some Secondary Stresses in Thin-Walled Box Beams.* (E. Reissner, J. Aeron. Sci., Vol. 9, No. 14, December, 1942, pp. 538-542.) (108/27 U.S.A.)

An analysis is made of the secondary stresses that arise in flat-sheet-covered box beams in which the curvature of the cover sheets does not conform with the curvature assumed by the extreme fibres of the spars when the beam is loaded. Formulas are derived for rib loads and for secondary sheet bending stresses as function of the primary sheet stress, the rib spacing, the beam height and the cover sheet thickness. With regard to the secondary stresses, the flexibility of ribs and spars, which in principle can be taken into consideration, is neglected so that the values obtained for the stresses are conservative. It is found that secondary sheet bending is largely restricted to narrow edge zones adjacent to ribs and spars.

*Determination of Stresses from Strains on Three Intersecting Gauge Lines and its Application to Actual Tests.* (W. R. Osgood and R. G. Stronn, Bureau Standard, Vol. 10, 1933, pp. 685-692.) (108/28 U.S.A.)

If $\epsilon_x$ and $\epsilon_y$ are the strain components at a given point along rectangular co-ordinates in the plane of stress, and $\epsilon'_x$ and $\epsilon'_y$ are similar components about a second set of axes $x'$, $y'$ making an angle $\psi$ with the first, the following relationship holds:—

$$\epsilon'_x = \tfrac{1}{2}(\epsilon_x + \epsilon_y) + \tfrac{1}{2}(\epsilon_x - \epsilon_y)\cos 2\psi + \tfrac{1}{2}\gamma \sin 2\psi$$
$$\epsilon'_y = \tfrac{1}{2}(\epsilon_x + \epsilon_y) - \tfrac{1}{2}(\epsilon_x - \epsilon_y)\cos 2\psi - \tfrac{1}{2}\gamma \sin 2\psi$$
$$\gamma' = (\epsilon_x - \epsilon_y)\sin 2\psi + \gamma \cos 2\psi$$

where $\gamma$ = shearing strain with respect to axes $x$ and $y$,

$\gamma'$ = ,, ,, ,, ,, $x'$ and $y'$.

If at a given point the strain components $\epsilon_1$, $\epsilon_2$ and $\epsilon_3$ making angles $\psi_1$, $\psi_2$ and $\psi_3$ with any axis $x$ are known, the state of strain ($\epsilon_x$, $\epsilon_y$, $\gamma$) at the point as well as the principal strains can be determined by a geometrical construction, details of which are given (so-called dyadic circle).

When the principal strains $\epsilon_u$ and $\epsilon_v$ and the numerically greatest shearing strain $\gamma$ max. have been found, the principal stresses $\sigma_u$ and $\sigma_v$ and greatest shearing stress $\tau$ max. follow from the equations:—

$$\sigma_u = \left\{ \frac{m^2 E}{(m^2 - 1)} \right\} \left\{ \epsilon_u + \left(\frac{1}{m}\right)\epsilon_v \right\}$$
$$\sigma_v = \left\{ \frac{m^2 E}{(m^2 - 1)} \right\} \left\{ \epsilon_v + \left(\frac{1}{m}\right)\epsilon_u \right\}$$
$$\tau \text{ max.} = G\gamma \text{ max.}$$

where $1/m$ = Poisson's ratio.
$E$ = modulus of elasticity.
$G$ = shearing modulus.
$$= \frac{mE}{\{2(m+1)\}}$$

The author describes application of the method to stress determinations in dams, bearing plates, beams and gusset plates.

Whilst three gauge lines are theoretically sufficient, four or more lines may be employed. The dyadic circle now becomes over-determined, since it will have more than three tangents. In this case the circle giving the best fit is drawn.

In conclusion, it must be emphasised that the results obtained only apply to the surface of a three-dimensional body. If the body has, however, only two principal dimensions, a complete picture of the state of stress is obtained.

*Influence of Delayed Quenching During Solution Test Treatment on the Resistance of Dural to Intercrystalline Corrosion.* (J. C. Arrowsmith and G. Murray, Sheet Metal Industry, Vol. 16, No. 188, December, 1942, pp. 1,879-1,884.) (108/30 Great Britain.)

The effect of varying the delay period between removing duralumin from the heating furnace and quenching in water has been studied with particular reference to the corrosion resistance of the product. It has been established that this delay should be not more than 10 sec. if a high degree of resistance to intercrystalline corrosion is to be ensured in thin gauge metal.

Coastal atmospheric corrosion tests on duralumin-type alloys, which were protected by various type of surface treatment have been carried out. These demonstrate that accelerated corrosion tests on the bare metal should not be regarded as sure indication of the ability of a material to withstand service conditions. In particular it is shown that the resistance of the core of aluminium-coated aluminium alloy to intercrystalline corrosion is of only minor significance in determining the behaviour of the composite material.

*Use of Bismuth in Fusible Alloys.* (Circular of the Bureau of Standards, No. 388, December 15th, 1930.) (108/32 U.S.A.)

The literature and use of fusible alloys (Pb, Bi, Sn, Cd) are reviewed in this paper (up to 1930).

Two, three or four component fusible metals are discussed, special attention being given to volume change in the alloys during and after solidification.

The principle use for fusible alloys is in soldering, and since several of them wet glass, they are admirably suited for making seals and gastight joints in glass apparatus. Other applications are: Safety devices against fire, heat treatment baths and material testing (grips can be cast on pieces of irregular cross-section and subsequently removed without risk of injuring specimen, since melting temperature alloy is generally below 100°C.).

Bismuth head alloys will expand or contract during solidification, depending on whether the bismuth content is greater or less that 52 per cent.

It is interesting to note that the melting point of quaternary fusible alloys ($\simeq$70°C.) can be appreciably lowered by the addition of mercury and this five-component alloy will remain liquid at room temperature if enough mercury is added.

*Properties of Lead-Bismuth, Lead-Tin, Type Metal and Fusible Alloys.* (J. G. Thompson, Bureau of Standards Research Paper, No. 248, November, 1930.) (108/33 U.S.A.)

LEAD-BISMUTH.

The mechanical strength was obtained from cast test bars of standard dimensions. On account of the ductility of the alloy, the rate of application of the load was fixed to correspond to a rate of travel of the free head of the testing machine of 0.5 in. per minute.

The composition 0-52 per cent. Bi was investigated, the tensile strength increasing fairly uniformly from 2,000 to 6,000 lb. per sq. in. over the range.

The elongation of the 25 per cent. Bi alloy is of the order of 40 per cent., the Brinell hardness (10 mm. ball 100 kg. for one minute) being 8, melt point $\simeq$ 250°C. The hardening effect of Bi on lead is less than that of antimony, and Lead-Bi alloys containing up to 12 per cent. Bi can be readily rolled into sheet $\frac{1}{32}$ in. thick There seems to be no susceptibility to heat treatment or age hardening.

LEAD-TIN.

For tin contents between 30 and 45 per cent.

| | | |
|---|---|---|
| Tensile ... ... | =6,900 lb./sq. in. | Melting point $\simeq$ 250°C. |
| Elongation ... ... | = $\sim$ 100 per cent. | |
| Brinell hardness ... | = $\sim$ 12. | |

TYPE METAL.

A representative monotype consists of a 70/20/10 lead-antimony-tin alloy characterised by a relatively high tensile strength (12,000 lb. per sq. in.) and Brinell hardness (25). The elongation is normal (3 per cent.). Melting point 240°C.

The casting properties can be improved by the addition of 1-4 per cent. of Bi.

FUSIBLE ALLOYS.

The mechanical properties of Wood's alloy are given below:—

| | |
|---|---|
| Per cent. composition | Bi 50. Melting point ~ 70°C. |
| | Pb 26.7. |
| | Sn 13.3. |
| | Cd 10. |
| Tensile ... ... | 6,000 lb. per sq. in. |
| Elongation ... ... | 140 per cent. |
| Brinell hardness ... | 9. |

The alloy can be drawn to wire without difficulty.

The addition of 10 per cent. mercury reduces elongation by over 50 per cent. and lowers melting point to 64°C. without appreciably affecting tensile strength. The alloy, however, now becomes susceptible to ageing.

*Carburizing Characteristics of 0.20 per cent. Carbon Alloy and Plain Carbon Steels.* (G. K. Manning, 24th Annual Convention of the A.S.M., October, 1942.) (Preprint No. 5.) (108/34 U.S.A.)

Eight common carburizing steels were tested in five different commercial solid carburizers.

Chromium steels produced cases with extremely high surface carbon content when carburized in four of the carburizers. Only one of the carburizers tested resulted in low surface carbon concentration for chromium steels. Nickel opposed chromium in its effect on surface carbon concentration.

Contrary to a common belief, lower carburizing temperatures did not result in cases of greater surface carbon content.

A low carbon skin (0.003 to 0.001 inch deep) was observed to be present after carburizing for 10 hours or longer at 1700 degrees Fahr. (925 degrees Cent.) but was not found at lower carburizing temperatures.

*Bursting Tests on Notched Alloy Steel Tubing.* (G. Sachs, 24th Annual Convention of the A.S.M., October, 1942.) (Preprint No. 7.) (108/35 U.S.A.)

Heat treated alloy steel tubing subjected simultaneously to circumferential and longitudinal tension showed slightly higher tensile strengths and much lower ductility values in the circumferential direction than rod tested in tension.

A sharp longitudinal notch on the outside surface of the tubing was found to be the most severe embrittling agent observed so far, in that steels with a strength level as low as 150,000 pounds per square inch had a notch strength less than the strength of unnotched tubing.

Such a single notch did not have the strength-increasing effect which was expected for sufficiently ductile conditions. A double notch (on both inside and outside surface), however, did produce such a strength-increasing effect, but the increased lateral stress which is responsible for such an effect did not cause any greater embrittlement than a single notch.

The conditions of fibre direction are usually considered to be less favourable in tubular specimens machined from solid rod and subjected to internal pressure than for drawn tubing. However, no such effect of fibre direction was observed in tests on notched tubes machined from rod.

*Notched Bar Tensile Tests on Heat-Treated Low Alloy Steels.* (G. Sachs, 24th Annual Convention of the A.S.M., October, 1942.) (Preprint No. 8.) (108/36 U.S.A.)

Various oil-hardening alloy steels of the 0.40 per cent. carbon class were tested as notched tensile test bars in various conditions of strength level as determined by the tempering temperature.

It was found that the ductility of the steel was considerably reduced in the notched section, but that the notch strength was not impaired as long as the steel had an ultimate strength below 200,000 pounds per square inch. For such soft steels, the strength was increased by a percentage which was approximately equal to the percentage cross-sectional area removed by the notch. For stronger steels, a shallow notch did not seriously affect the notch strength and notch ductility. However, the ductility of deeply notched specimens was nearly zero and their strength greatly reduced. This condition prevailed for steels with an ultimate strength of between 220,000 and 280,000 pounds per square inch, although the ductility given by ordinary tensile tests remained almost as high in the strength region as for the softer steels. Thus the values found from an ordinary tensile test are not a sufficient criterion of the suitability of a steel for commercial applications involving shoulders, keyways, and other irregularities in shape that produce a similar effect to that of a deep notch.

The embrittling effect of factors such as overheating and large section size is not shown by ordinary tensile tests, but it is readily observed from the results of notched bar tensile tests.

An attempt has been made to correlate the results with the shape of the stress-strain curve for the notched section, and with previous conceptions of the laws of plastic flow and the stress distribution in a notched section.

*Stress-Strain Measurements in the Drawing of Cylindrical Cups.* (E. L. Bartholomew, 24th Annual Convention of the A.S.M., October, 1942.) (Preprint No. 9.) (108/37 U.S.A.)

Cup wall stresses are determined for various blank diameters. The tensile stress in the cup wall for the maximum diameter blank is compared with the actual stress from the tensile test. The tensile test data are reported in the form of the s—q′ plot. Strain measurements are also made in the cup walls. The maximum blank diameter which may be successfully drawn is determined from the tensile test data. The maximum blank diameter for a metal in a given set of press conditions represents the limit of drawability of that metal. Since the tensile test data can be used to determine this blank diameter, then, in effect, they are an index of the drawability of the metal. Brass, aluminium and deep drawing sheet are tested. General stress-strain comparisons are made to show the possibilities of this particular interpretation of tensile test data.

*Influence of Strain Rate on Strength and Type of Failure of Carbon-Molybdenum Steel at* 850, 1,000 *and* 1,100 *Degrees Fahr.* (R. F. Miller, 24th Annual Convention of the A.S.M., October, 1942.) (Preprint No. 24.) (108/38 U.S.A.)

Elevated temperature tensile tests were carried out on pearlitic and spheroidized carbon-molybdenum steel at a series of uniform strain rates. As the strain rate was decreased, the tensile strength decreased, the elongation first increased and then decreased, and the mode of fracture changed from transgranular to intergranular. It was concluded that intergranular failure is normal in metals strained slowly at elevated temperature, and that it does not necessarily indicate deterioration of the material, or lack of plasticity preceding fracture.

*The Hardening of Tool Steels.* (P. Payson, 24th Annual Convention of the A.S.M., October, 1942.) (Preprint No. 29.) (108/39 U.S.A.)

The reactions which take place during the heat treatment of eleven commercial tool steels, from plain carbon to high speed, have been studied, and the transformation temperature time curves of the austenities of these steels are presented. The formation of the martensite in these steels is discussed, and emphasis is placed on the need for cooling the steels to low temperatures, in the hardening operation, before tempering is started. Finally, some data are presented to show the effects in these steels of variations in austenitizing temperatures on the formation of martensite, and on the retention of austenite at room temperature.

*The Effect of Moderate Cold Rolling on the Hardness of the Surface Layer of 0.34 per cent. Carbon Steel Plates.* (H. K. Herschman, 24th Annual Convention of the A.S.M., October, 1942.) (Preprint No. 34.) (108/40 U.S.A.)

The influence of moderate cold rolling on the surface indentation hardness of 0.34 per cent. carbon steel plate initially surface finished by three different methods was investigated. Variations of the hardness of the surface layers extending to different depths below the surface of the specimens were determined by applying different loads on a Knoop indenter. Indentation hardness tests also were made with the Rockwell superficial hardness machine. The results obtained with the Knoop indenter showed significantly lower hardness numbers for the superficial layer of the steel after the lighter degrees of rolling, the magnitude of change apparently being influenced by the mode of initial finishing. Hardness decreases were not revealed by tests made with the Rockwell superficial machine nor in any case in which the penetration of the Knoop indenter exceeded about 0.0003 inch.

*Corrosion of Unstressed Specimens of Alloy Steel by Steam at Temperatures up to 1,800°F.* (G. A. Hawkins and others, A.S.M.E., Dec. (1942) Meeting.) (Preprint No. 38.) (108/41 U.S.A.)

This paper presents the results of tests made at the Engineering Experiment Station of Purdue University to determine relative resistance to corrosion by steam of unstressed specimens of various alloy steel at temperatures of 1500 F. and 1800 F. The data include results from 500-hr. tests at 1500 F. and 1800 F. for a representative selection of steels containing up to 18 per cent. chromium, and for a 500-hr. and a 1300-hr. test on 25-20 and 25-15-2w steels at 1800 F. The results permit extension of previously published data to cover the temperature range from 1000 to 1800 F. All of the steels tested except the 25-20 and 25-15-2w specimens show rapid corrosion beyond a limiting temperature which increases with chromium content. The 25-20 and 25-15-2w steels were extremely resistant to steam corrosion for exposures up to 1300 hr. at 1800 F.

*Relief of Residual Stress in Streamline Tie Rods.* (R. E. Pollard and F. M. Reinhart, Bur. of Stands. J. Res., Vol. 28, No. 6, June, 1942, pp. 755-772.) (108/42 U.S.A.)

A high percentage of the streamline tie rod failures examined at the National Bureau of Standards have been attributed to torsional fatigue due to synchronous vibrations. One characteristic feature of such failures, in the streamline portion of the tie rod, is that fracture invariably starts at or near the intersection of the minor axis with the surface.

The reduction to streamline section is usually performed by rolling or drawing. In most tie rods the high physical properties required are produced by cold-working during these operations. Such tie rods naturally contain very high residual (internal) stresses. Residual stresses may be dangerous in highly stressed members, such as tie rods, particularly when the distribution of stress is such that it acts in the same direction as the superimposed service stress.

In most tie rods, the residual stress is so distributed that the highest tensile stress occurs at the intersection of the minor axis of the cross section with the streamline surface. This is the point at which the fractures start. High residual stresses, therefore, probably are important contributory causes of failure in these tie rods.

About two-thirds of the residual stress in cold-worked S.A.E. 1050 steel tie rods was relieved by heating them 30 minutes at 600° F. Cold-worked austentic stainless steel tie rods could be heated at temperatures up to 1,000° F. without lowering the important physical properties. With materials of straight 18-8 composition, however, the limiting heating temperature was found to be about 900° F., because at higher temperatures precipitation of chromium carbide occurred. It is possible that materials containing additions of titanium, columbium, or molybdenum could be heated at higher temperatures, since the carbides of these elements would be precipitated in preference to chromium carbide.

Microscopic examination and Vickers indentation tests indicated localized differences in the amount of cold-working. Such differences may explain the distribution of residual stress in cold-worked tie rods.

*The Effect of Hardness on the Machinability of Six Alloy Steels.* (O. W. Boston, 24th Annual Convention of the A.S.M., October, 1942.) (Preprint No. 4.) (108/43 U.S.A.)

The effect of hardness on the machinability of steel was studied by means of a series of tuning tool-life tests on six alloy steels in the quenched and tempered condition. The tool material, tool shape, size of cut, and cutting fluid represented commercial practice. The results show marked sensitivity of machinability to hardness in all six of the types of alloy steel tested. These steels gave a wide range of machinability ratings, particularly at high hardness. However, the difference in machinability between two heats of the same type of steel was as great as the range covered by the six types. There appears to be a direct correlation of hardenability with machinability of the harder steels.

*On the Location of Flaws by Stereo-Radiography.* (J. Rigbey, 24th Annual Convention of the A.S.M., October, 1942.) (Preprint No. 18.) (108/44 U.S.A.)

Stereoscopic radiographs utilizing two exposures corresponding to two positions of the X-ray tube, usually about a foot apart, may be made on a single film instead of separate films as is customary. This double exposure method enables direct measurement of the distance between the two images of an internal defect in the subject radiographed. From this measurement, the vertical position of the flaw can be deduced mathematically rather than by visual estimation in which the two films are set up in a stereoscopic viewing stand. Hence this method also eliminates the necessity of special viewing apparatus.

In experiments with cast aluminium and steel blocks up to two inches in thickness, it was found that the consequent reduction in sensitivity and definition is not prohibitive where a sensitivity of 2 per cent. in aluminium and 4 per cent. in steel is sufficient. The vertical position of holes of regular shape can often be measured with an error of only $\pm 3$ per cent. although larger errors must be expected in practice where flaws are more irregular.

*The Fluorescent Penetrant Method of Detecting Discontinuities.* (Taber de Forest, 24th Annual Convention of the A.S.M., October, 1942.) (Preprint No. 19.) (108/45 U.S.A.)

Cracks and porosity in metals may be located by a suitable penetrating fluid carrying a highly fluorescent dye. When illuminated by near ultraviolet light, the extremely minute quantities drawn into the cracks by capillary attraction are unmistakably identified. The new test is similar to the oil and whiting method, but is far more sensitive and more rapid in application. Only capillary spaces open to the surface can be found, but experience has shown that many vital defects are of this character, especially in the light metals.

Photographs are shown of typical non-ferrous parts commercially inspected by the new method.

*Practical Aspects of Making Expanded Joints.* (C. A. Maxwell, Annual Meeting of the A.S.M.E., Nov.-Dec., 1942.) (Preprint No. 36.) (108/46 U.S.A.)

As one of three current papers on the general subject of rolling-in boiler, heat-exchanger, and condenser tubes, this presentation deals more particularly with the practical application of recent tube-expanding equipment and methods largely developed by The Babcock and Wilcox Company. Progress in the solution of tube-rolling problems from 1924, when axial movement of tubes in their seats became particularly acute, down to the present time is noted by the author, accomplishments in this direction being the work of comparatively few engineers who have devoted their attention to the various aspects. Only since 1940, when a new expander was developed, have the weaknesses of the standard expander been overcome, making possible the expanding of tubes in seats of unlimited width. There are three basic tools for producing expanded joints from which all others are derived, the roll, the prosser, and the ball-drift expander. Details of each are given. The procedures followed are explained comprehensively, as it is also the function of the ball-drift expander used for relatively small tubes in thick seats.

*Production of High Speed Helical Gears.* (S. A. Gouling, Engineer, Vol. 175, No. 4,543, 5/2/43, pp. 119-120.) (108/48 Great Britain.)

Main conclusions:—

1. A hobbing machine with a properly designed solid master worm wheel will cut accurate and quiet-running gears, assuming that the hobbing machine size is properly related to the diameter of the cut gears.

2. Accuracy and quiet running are assisted if helical gears are cut by hobbing machines arranged for use without the differential mechanism.

3. Noise originates from the characteristics of the tooth flank of gears just as from the face of a gramophone disc. Therefore gear box construction, materials, etc., are only of secondary influence on gear noises. The total load on the gear teeth affects apparent noise volume very little.

4. As a consequence of (1) the simpler machine tool with the solid worm wheel enables gear noises to be diagnosed and cured more easily, including the differentiation between hobber noise and contact frequencies caused by flank or alignment errors.

*World Production of Magnesium in Metric Tons.* (Imperial Institute, Mineral Resources Dept. Report on Magnesium, 1939, pp. 23-24.) (108/49 Great Britain.)

| | 1933 | 1934 | 1935 | 1936 | 1937 | 1938 |
|---|---|---|---|---|---|---|
| Germany ... ... ... | — | Figures not available | | | 12,000 | 14,000 |
| G.B. ... ... ... ... | — | Figures not available | | | 2,000 | 3,000 |
| U.S.A. ... ... ... | 641 | 1,897 | 1,893 | 1,743 | 2,000 | 3,000 |
| France ... ... ... | 128 | 241 | 419 | 1,365 | 1,800 | 2,000 |
| Japan ... ... ... | 103 | 139 | 350 | 650 | 1,200 | 1,500 |
| U.S.S.R. ... ... ... | — | Figures not available | | | 700 | 1,000 |
| Switzerland ... ... | — | Figures not available | | | 230 | 300 |
| Italy ...... ... ... | — | — | — | — | 70 | 200 |

According to American Aviation (1.10.41, p. 13) the U.S.A. production of magnesium is estimated at 10,000 tons for 1941 and an output of 100,000 tons is hoped for by 1943.

*World Production of Aluminium in Metric Tons.* (Metal Statistics, 1939 (U.S.A.), p. 503.) (108/50 U.S.A.)

Figures are in units of 1,000 tons.

| | 1933 | 1934 | 1935 | 1936 | 1937 | 1938 |
|---|---|---|---|---|---|---|
| Germany ... ... ... | 18.9 | 37.2 | 70.8 | 97.5 | 127.5 | 175.0 |
| G.B. ... ... ... ... | 11.0 | 13.0 | 15.1 | 16.4 | 19.4 | 24.0 |
| Canada ... ... ... | 16.2 | 15.5 | 20.6 | 26.9 | 42.6 | 50.0 |
| U.S.A. ... ... ... | 38.6 | 33.6 | 54.1 | 102.0 | 132.8 | 130.1 |
| France ... ... ... | 14.3 | 15.1 | 22.0 | 28.3 | 34.5 | 40.0 |
| Japan ... ... ... | — | .7 | 4.0 | 6.7 | 10.5 | 15.0 |
| U.S.S.R. ... ... ... | 4.4 | 14.4 | 24.5 | 37.9 | 45.0 | 50.0 |
| Switzerland ... ... | 7.5 | 8.2 | 11.7 | 13.7 | 25.0 | 28.0 |
| Italy ... ... ... ... | 12.1 | 12.8 | 13.8 | 15.9 | 22.9 | 28.0 |

According to American Aviation (1.10.41, p. 19), the U.S.A. production in 1943 is estimated at 300,000 tons.

*Photographic Templates.* (E. C. Jewett and C. D. Tate, Mech. Engg., Vol. 64, No. 11, Nov., 1942, pp. 787-792.) (108/51 U.S.A.

In aeroplane production, several templates may be required for each part and several copies of each template may be necessary where a number of production lines are occupied on the same models. Thus contour, jig, bending, and checking templates may be required, and for a simple aeroplane model as many as 25,000 templates may be used. Laying out these templates by hand would not only be very laborious, but errors may arise. To overcome this difficulty, both photographic and non-photographic methods for template production have been investigated. The present article only deals with the former process, which may be carried out either by contact or projection. In either case the template material is coated with a photographic emulsion. This is most conveniently carried out by the use of a transfer paper (carrying the emulsion) which is cemented on to the template, emulsion side in contact. Subsequent stripping of the paper leaves the template coated with a firmly adhering photo sensitized layer. The method can be applied both to metals and wood or plastic templates.

In the direct contact process, the original drawing is placed over the sensitized sheet and exposures made either by direct light or X-rays. In the former case, the original must be traced on glass or a transparent plastic which is not always convenient. For this reason X-ray exposure is now favoured. When using X-rays, the original pencil drawing is made on a sheet which has been sprayed with X-ray phosphorescent lacquer.

The phosphorescence induced by X-rays persists for some time and several contact prints can be obtained on the sensitized template material for one X-ray exposure. In its simplest form the direct contact process (whether by light or X-rays) leads to mirror images of the master drawing. If true copies are required, an intermediate negative will be necessary. This generally presents no difficulties.

The main disadvantage of the contact process lies in the fact that no change in scale is possible in the reproduction. On the other hand the outlay for the plant is moderate, the X-ray apparatus being considerably cheaper than the large size camera required for photographic reproduction.

In this method a reduced size negative (¼ to 1/5th size) is made on a glass plate and then projected to any desired scale on to the sensitized template material. The main drawback is the expense of the camera and its mounting. The equipment can, however, be also used to produce reduced scale prints from the original drawings, and this will lead to a considerable saving in blue print material. In a particular case, quoted by the author, the saving on this head alone amounted to over 10,000 dollars, which practically wiped out the difference in first cost between the photo projection and X-ray contact outfits (19,000 and 9,000 dollars respectively).

*Formulas for the Skin Effect.* (H. A. Wheeler, Procs. I.R.E., Vol. 30, No. 9, Sept., 1942, pp. 412-424.) (108/52 U.S.A.)

At radio frequencies, the penetration of currents and magnetic fields into the surface of conductors is governed by the skin effect. Many formulas are simplified if expressed in terms of the " depth of penetration," which has merely the dimension of length but involves the frequency and the conductivity and permeability of the conductive material. Another useful parameter is the "surface resistivity " determined by the skin effect, which has simply the dimension of resistance. These parameters are given for representative metals by a convenient chart covering a wide range of frequency. The " incremental-inductance rule " is given for determining not only the effective resistance of a circuit but also the added resistance caused by conductors in the neighbourhood of the circuit. Simple formulas are given for the resistance of wires, transmission lines, and coils; for the shielding effect of sheet metal; for the resistance caused by a plane or cylindrical shield near a coil; and for the properties of a transformer with a laminated iron core.

*A New Direct Crystal-Controlled Oscillator for Ultra-Short Wave Frequencies.* (W. P. Mason, Procs. I.R.E., Vol. 30, Oct., 1942, pp. 464-472.) (108/53 U.S.A.)

An ultra-high-frequency crystal oscillator is described which utilizes a mechanical harmonic of an AT or BT crystal. With the oscillator frequencies as high as 197 megacycles, harmonics as high as the 23rd have been excited. Taking the second electrical harmonic of the oscillator, frequencies as high as 300 megacycles, or 1 meter have been obtained. Since a mechanical harmonic is used, the crystal can be of a practical size to handle and adjust. The harmonic vibration of the AT and BT crystals have as low a temperature coefficient as the fundamental mode, and temperature coefficients of less than two parts per million per degree centigrade are easily obtained. Stability curves for this type of oscillator are shown and the results indicate that at 120 megacycles stabilities in the same order of magnitude as for ordinary crystal oscillators can be obtained. Without temperature or voltage control it appears likely that the frequency should remain constant to $\pm 0.0025$ per cent.

Some measurements have been made of the properties of harmonic crystals at high frequencies. It was found that the $Q$ of a crystal is independent of the frequency but in general increases with harmonic order. The ratio of capacitances $r$ of a crystal increases as the square of the harmonic order. It is shown that in order to obtain a positive reactance in the crystal $Q > 2r$. This relation will only be satisfied for harmonics of AT crystals less than the 7th. As a result oscillator circuits such as the Pierce circuit cannot be used to drive crystals at high harmonic frequencies. A discussion of oscillator circuits is given and it is shown that a capacitance-bridge oscillator circuit with the crystal in one arm is the best type to use for high-frequency harmonic crystals.

*Magnetic Balance for the Inspection of Austenitic Steel.* (R. L. Sanford, Bureau of Standards, Journal of Research, Vol. 10, 1933, pp. 321-326.) (108/54 U.S.A.)

The gamma phase of iron is non-magnetic. In ordinary carbon steels, this phase is only stable at high temperatures. In the presence of Cr and Ni, however, stability of the gamma phase persists to ordinary temperatures causing the low magnetic permeability to such " stainless " steels ($\mu \sim 2$).

As corrosion tests of these materials are rather tedious, the author suggests direct measurement of magnetic permeability as providing an index for corrosion resistance.

For this purpose a single form of magnetic balance is described which consists of a pair of permanent magnet bars, each 5 cm. long and 5 mm. diameter placed end to end and pivoted about an axis passing through the c.g. of the assembly (astatic mounting).

One of the free poles has a spherical end which is placed in contact with the materials under test (magnetizing force $\simeq$800 œrsted) and the force required for separation is measured on a phosphor bronze helical spring (torsion balance).

The force as registered on a dial can be directly converted into permeability by calibrating the instrument with a magnetic material of known characteristics.

For routine inspection a fixed spring tension is probably the most satisfactory.

*New Magnetic Materials.* (W. E. Ruder, Procs. I.R.E., Vol. 30, No. 10, Oct., 1942, pp. 437-440.) (108/55 U.S.A.)

With the rapid growth of the radio and communication industry, a need for magnetic materials having special properties for this particular application has developed. A number of nickel-iron alloys, such as permalloy, nicaloi, Mu Metal, and variations of these have found wide application as they all have the common property of high permeability at relatively low inductions. Where high resistivity also is desired, additional alloying elements, such as chromium and molybdenum, have been added. Complete freedom from strain, either mechanical or chemical, is necessary for good magnetic quality, and the strain set up by magnetization can be compensated for in many cases by heat treatment in a magnetic field. Silicon-iron alloys and some of the nickel-iron alloys can be very much improved by a combination of cold-rolling and heat treatment which induces a high degree of preferred orientation. This cold-rolled strip has found wide application in various types of electrical apparatus.

Permanent-magnet alloys of the alnico type have been very greatly improved recently so that the external energy factor (BHmax) is now about three times what it was in the best alnico heretofore available. Comparative data on the different types of permanent-magnet steels and alloys are given, and the new material should find wide application in the radio field. Considerable saving in material and size and weight of apparatus can be made by the application of these outstanding recent developments in magnetic materials provided suitable changes in design are made to allow for the most economical use.

*Compressed Powder Magnets with Synthetic Resin Binder.* (H. Dehler, Stahl und Eisen, Vol. 62, No. 47, 19/11/42, pp. 983-986.) (108/56 Germany.)

Permanent magnet alloys of the Fe-Ni-Al type are glass hard and very brittle. They cannot be forged or rolled and the only machining operation possible is that of grinding. The casting of such alloys is also difficult, especially if small holes have to be provided for fitting pole pieces or other attachments. For this reason, powder magnets in which the material is compacted by sintering, have been in use for some time.

As an alternative, the author describes a method of compacting by means of a resin binder (about 6 per cent. of phenol or polyvinychloride). By suitably grading the powdered alloy (*e.g.*, 50 per cent. 1 mm., 20 per cent. .3 mm. and 30 per cent. .05 mm. grain size) the density of the compact is of the order of 90 per cent. of the original alloy density. Compacting pressure $\sim$1000 atmospheres, hardening temperature $\sim$180° C.) This method of compacting enables the ready inspection of fittings or the provision of fine holes. The moulded product comes out true to size and no subsequent machining is necessary. The new process thus lends itself admirably to mass production and the saving in man hours is very considerable.

The magnetic qualities of such powder magnets are within 20 per cent. of the corresponding values for the cast material.

It is interesting to note that the new process also enables the production of magnetic filaments by extrusion. Finally by adopting appropriate binders, a magnetic paste or paint can be obtained which has proved useful when additional magnetic fields have to be provided in any arbitrary locality.

*Ophthalmic Aspects of Acute Oxygen Deficiency.* (R. A. McFarland, J. N. Evans and M. H. Halperin, Arch. Ophthalmology, 1941, Nov., Vol. 26, No. 5, pp. 886-913, 7 Figs. (71 Refs.) (108/57 Great Britain.)

After an introduction dealing with the general physiological changes in the human body when deprived of oxygen through the medium of the low pressure chamber, the authors describe the visual effects which may be anticipated.

The first systematic studies were made by Wilmers and Berens in 1918, the tests being carried out upon flying personnel. In the present study the authors have found that light minimum is impaired, as is also dark adaptation. Visual acuity, including the reactions of photopic vision, was found to be decreased in dim light and unaffected in bright light under conditions corresponding to an altitude of 18,000 feet. With regard to the central field of vision, tests were carried out with the angioscotometer. Here it was found that the field was decreased owing to the widening of the angioscotoma. A study of colour vision revealed that this was further impaired if a defect already existed. The latent period of after-images was prolonged and the diameter of the arteries and veins increased slightly.

The authors found with regard to the extraocular muscles that any weakness became exaggerated, the range of action decreased and the co-ordinated ocular movements, such as those in reading, were less orderly. Latent defects became apparent.

They mention the influence of visual reactions of this character upon modern warfare in the air and stress that definite strategic advantage may be obtained by a more thorough knowledge of visual acuity and night vision at high altitudes. Oxygen is so basic a substance in biological functions that the ocular effects of anoxaemia cannot fail to reveal important data for the opthalmologist.

*Effects of Highly Concentrated Oxygen on the Organism.* (H. Becker-Freyseng, Verhandl. d. deut. Gesellsch. f. Kreislaufforsch., 1940, Vol. 13, pp. 83-85.) (108/58 Germany.)

According to Becker-Freyseng, the same concentrations of oxygen act differently on various types of animals. In a chamber of 40 cubic metres with normal moisture content, temperature, carbon dioxide content and air movement, but with an oxygen concentration of 80 to 90 per cent. and a barometric pressure of 76 cm. of mercury, mice, rats and dogs survived for eight days. Guinea pigs, however, were all dead at the end of four days. Albinotic rabbits died in three to four days, while pigmented ones survived for six or seven days or recovered after the experiment. Some died shortly after being removed from the high oxygen concentration.

The varying behaviour of the different types of animals indicated the necessity of caution in using human subjects.

The author and an associate remained for three days in an atmosphere containing 90 per cent. oxygen. During the first twenty-four hours no changes were observed but from then on, nervous disturbances (particularly paresthesias) were noticed. Bronchitis developed in one of the two investigators.

The author concludes from this that oxygen inhalation at altitudes over 4,000 meters is entirely without danger for the length of time aviators remain at these altitudes, the more so, since the partial pressure of the oxygen, as the result of the low total pressure, is normal even with a high oxygen concentration.

*On the Neurologic and Characterlogic Assessment of Flying Fitness. (A Study Based on the Medical Examination of* 2,000 *Flying Candidates.)* (R. Lemke, Luftfahrtmedizin, Vol. 3, No. 2, 1938-9, pp. 73-81.) (108/59 Germany.)

This paper stresses the importance of neurology and medical psychology in the selection of pilots. The mental strain involved in flying makes it imperative to select those candidates who are both mentally stable and reliable in character. The lack of reliable test methods for assessing character add enormously to the difficulties of the medical officers responsible for pilot selection.

The author reviews the medical histories of 2,000 flying candidates of an average age of 20. Of this number only 101 candidates were rejected as unfit, 104 were retained for further observation and the remainder were passed as fit. The candidates were placed in their respective body-build groups, were medically examined for epilepsy and other mental disorders and were interviewed by the psychiatrist. The past medical history of each candidate was carefully considered in order to detect possible latent tendencies of mental instability which might later manifest themselves under the strain of flying conditions. In addition the candidates were given a general knowledge test. In this connection 43 candidates failed to reach the required standard and were rejected.

In spite of the painstaking care taken in the selection of pilots, the author emphasises the difficulties in assessing temperamental suitability and concludes that wherever possible doubtful cases should be kept under observation.

*The Capacity of the Human Organism to Endure Centrifugal Forces in the Direction of Back to Chest.* (O. Gauer and S. Ruff, Luftfahrtmedizin, Vol. 3, No. 2, 1938-9, pp. 225-230.) (108/60 Germany.)

Tests showed that the human organism can tolerate for a period of over 30 seconds centrifugal forces of the order of at least 8-10 g. when the direction of these forces moves from back to chest. The physiological effects were found to be so slight that the authors consider it possible to increase this limit substantially particularly over short periods. Even over longer periods with centrifugal forces exceeding 8 g. the only injury manifested were petechial hæmorrhages in the eye which, however, disappeared after two days.

The amount of "g" that can be tolerated by the human organism is also shown to be largely dependent on the nature of the support provided for the body and the type of device employed for keeping the head in position.

*Changes in the Optical Reaction Time in Human Beings Subjected to High Centrifugal Forces.* (H. Burmeister, Luftfahrtmedizin, Vol. 3, No. 2, 1938-9, pp. 277-284.) (108/61 Germany.)

Seventeen tests were carried out on eight subjects in order to determine the changes in optical reaction time under various degrees of acceleration on the centrifuge. This "reaction time" was measured by the time taken by the subject in response to a light signal to pull back an iron rod functioning like a control column.

When the centrifugal forces acted in a chest to back direction a slight prolongation of reaction time was observed in the case of five subjects when subjected to an acceleration of 4 g. This slowing up of reaction time was most pronounced at an acceleration of 8 g.

When the centrifugal forces acted in a head to seat direction, a slowing up of reaction time occurred even at 3 g. At 4.5 g. the change in reaction time was very pronounced, the subject showing symptoms of "black-out."

*On the Use of Stimulants to Promote Gaseous Exchange in the Body Under Condition of Work at Low Pressure.* (A. Rühl, W. Kühn and G. Müller, Luftfahrtmedizin, Vol. 3, No. 2, 1938-9, pp. 285-301.) (108/62 Germany.)

This paper deals with the problem of reducing the oxygen "debt" that is set up in the oxygen supply of the blood at low atmospheric pressure.

It is shown that cardiazol and coramin when injected into the body are effective in raising the reduced blood-pressure but scarcely have any effect on reducing respiratory difficulties. On the other hand it is shown that $CO_2$ has a decided therapeutic value as demonstrated by the results obtained for the various tests carried out in the low compression chamber. The advantages and disadvantages of $CO_2$ breathing are discussed. (Accurate metering is a difficulty.)

*Oxygen Requirements at High Altitudes.* (W. A. Wildhack, J. Aeron. Sci., Vol. 9, No. 14, December, 1942, pp. 543-547.) (108/63 U.S.A.)

Theoretical equations are developed to determine what concentrations of oxygen must be breathed at any altitude to maintain the "oxygen equivalent" of air at given altitudes—i.e. the same alveolar oxygen pressure. The partial pressures of water vapour and carbon dioxide are taken into account, as well as the variation of the pressure of carbon dioxide with the alveolar oxygen pressure.

Six curves are given on a chart showing the oxygen concentrations required at any altitude to maintain the oxygen equivalent of air at sea level and at altitudes of 5,000, 10,000, 15,000, 20,000 and 25,000 feet. Altitudes of 33,800, 40,000 and 46,000 feet with pure oxygen are equivalent to air at sea level, 10,000 and 20,000 feet respectively.

It is shown that these equivalents are nearly independent of the assumptions as to the state of physiological adaptation (acclimatisation) and should be applicable to all individuals.

Safety in any particular case will, however, depend enormously on the acclimatisation of the individual at the lower altitude. Thus, if the pilot is very near collapse at 20,000 feet, he will be in the same danger with 100 per cent. $O_2$ at 46,000 feet. If on the other hand, he is acclimatised to 20,000 feet (mainly by increased breathing volume) his alveolar oxygen pressure will be 37 mm. Hg against the danger limit of 21 mm. of the non-acclimatised subject. He will thus still have considerable reserves in hand at 46,000 feet with 100 per cent. $O_2$ and under favourable conditions may ascend to 49,000 feet without danger of collapse. It is interesting to note that the altitude record without pressure suit is of this order (Doneti, Italy, 47,360 feet).

At such great altitude, the lung ventilation is already at a maximum and the breathing of $CO_2$ mixtures is of doubtful value and may even be harmful. (At lower altitudes, $CO_2$ mixture are beneficial by improving the ventilation.)

In conclusion it may be emphasised that the author only considers oxygen want and that pressure effects leading to aeroembolism (liberation of dissolved gas in the blood stream) are neglected.

*The Method of Thin Films for the Study of Intermetallic Diffusion and Chemical Reactions at Metallic Surfaces.* (H. S. Coleman, 24th Annual Convention of the A.S.M., Oct., 1942.) (Preprint No. 17.) (108/64 U.S.A.)

A simple method for observing intermetallic diffusion rates has been devised. This method involves the deposition from the vapour phase first of one metal then another on top of it. A microscope slide is used as a film base. The diffusion rates are then observed at various temperatures. This is done by noting the change in reflectivity at one surface as the metals diffuse.

The apparatus consists essentially of a car headlight source maintained at constant voltage, the bi-metallic reflecting film, and a photronic cell connected to a recording microammeter. The recorder draws a record of the change in reflectivity automatically as the diffusion progresses.

This new method makes possible the study of diffusion rates of metals through metals and, in some cases, gases through metals at temperatures as low as 50 degrees Cent. and in lengths of time as little as five minutes, depending upon the metals involved, the thickness of the metals, and the temperatures.

The activation energies determined by the method of thin films are in agreement with values obtained by others. For example, the activation energy for the diffusion of gold into lead has been found to be $13700 \pm 300$ calories.

*Development and Performance of a Coal-Fired Unit Heater.* (R. M. Rush, A.S.M.E., Dec. Meeting, 1942.) (108/65 U.S.A.)

The paper describes an advanced design of coal-fired unit heater; explains the means by which high rates of heat transfer comparable to those of heating boilers are attained in an air heater, and by which the steel shell of the combustion chamber is kept at a safe temperature level; and gives results of tests of a large heater of this type. Various modifications of the installation arrangements are described, and the savings of critical materials and of man-hours, important under the present war conditions, attainable by the use of this type of heater are pointed out. A design of heater having all-refractory heat-transmitting surfaces, is also described. The reasons why the over-all savings of metal effected by the last-mentioned design must be disappointingly small, are explained.

*A Brief Account of Modern Kinematics.* (A. E. Richard de Jonge, Annual Meeting of the A.S.M.E., Nov. 30th-Dec. 4th, 1942.) (Preprint, Power Division, No. 23.) (108/66 U.S.A.)

The author has attempted to show what the various problems of plane kinematics are and how they have been approached and solved by simple means so as to make modern plane kinematics a usable tool, not for the mathematician or kinematician, but for the practical engineer. In this respect, the elements of a simple universally usable terminology are given, and the various branches of plane kinematics have been reviewed briefly to give the uninitiated an idea of the great simplicity of the modern methods. Quantitative kinematic synthesis has been presented briefly to the English-speaking engineer for the first time. A few remarks on the graphical methods used in space kinematics are added.

*Aeroplanes Fit to Fight. (American Opinion on the World's Best Military Aircraft.)* (N. F. Silsbee, Mech. Engg., Vol. 64, No. 12, Dec., 1942, pp. 847-852.) (108/68 U.S.A.)

The author's selection of the world's best aeroplanes is given below:—

| CLASS | DESIGNATION |
|---|---|
| Heavy Bombers ... ... ... | Fortress (B-17F).<br>Liberator (B-24E).<br>Lancaster. |
| Medium Bombers ... ... ... | Mitchell (B-25).<br>Martin (B-26).<br>Dornier (217E-2). |
| Light Bomber ... ... ... | Havoc (A-20). |
| Landbased Torpedo Bomber ... | Martin (B-26).<br>Savoia-Marchetti (SM.84). |
| Naval Torpedo Bomber ... ... | Grumman Avenger. |
| Naval Dive Bomber ... ... | Dauntless (SBD), Helldiver (SB2C). |
| Naval Patrol Bomber ... ... | Coronado (PY2Y). |
| Army Scout ... ... ... ... | Mustang (P-51). |
| Single-seater Fighter Interceptor | Spitfire IX, Focke Wulf 290.<br>Typhoon, Lightning (P-38G). |
| High Altitude ... ... ... | Me. 109G, Thunderbolt (P-47D). |
| All Purpose ... ... ... | Hurricane II, Warhawk (P-40F). |
| Naval ... ... ... ... ... | Wildcat (F4F-4), Corsair (F4U-1). |
| Night Fighter ... ... ... | Beaufighter II, Havoc (DB7-B). |
| Transport Seaplane ... ... | Clipper 314A. |
| Transport Landplane ... ... | Commando C-46.<br>Sky Master C-54. |

It will be noted that the Axis powers are only credited with outstanding designs in three classes, i.e.:

Medium bomber, Dornier 217E-2.
Landbased torpedo bomber, SM 84.
Interceptor fighter, F.W.290.
High altitude fighter, Me 109G.

*Metal-Spraying of Fabrics.* (M. W. Schoop and C. H. Daeschle, Handbook of Metal-Spraying, Zürich, 1935, pp. 148-151.) (108/69 Switzerland.)

The authors suggest the use of metallised fabric for the medical practice of diathermy. This metallised fabric can be applied directly to the body and enables the electric current to pass over the metallised surface to the affected part requiring diathermic treatment.

The metal spraying is carried out by the Schoop pistol and the material on which the heated metal is applied may be of linen, flannel, fine muslin or gauze. These materials when treated in this manner are perfectly pliable, possess good strength properties, the fibres being in no way affected by the heat of the liquid metal. The metal coating can be so finely applied as to make little difference to the weight of the material. Thus there was only a 12 gr. difference in weight after metallising both sides of a bandage 5 cm. wide and 5 m. long

According to the authors the metal coating showed no signs of brittleness even after bending or rubbing, the union with the fibre of the material apparently being complete. It was noticed, however, that frequent washing in soapy water affected the electrical conductivity of the material. This was explained by the fact that the fibre tends to swell thereby detaching the adhering metallic particles.

---

## LIST OF SELECTED TRANSLATIONS.

No. 53.

NOTE.—Applications for the loan of copies of translations mentioned below should be addressed to the Secretary (R.T.P.3), Ministry of Aircraft Production, and not to the Royal Aeronautical Society. Copies will be loaned as far as availability of stocks permits. Suggestions concerning new translations will be considered in relation to general interest and facilities available.

Lists of selected translations have appeared in this publication since September, 1938.

### THEORY AND PRACTICE OF WARFARE.

| TRANSLATION NUMBER AND AUTHOR. | | TITLE AND REFERENCE. |
|---|---|---|
| 1652 | —— ... ... | *Diving Brake of the Ju. 87 Dive Bomber.* (Flugsport, Vol. 34, No. 14, 8/7/42, pp. 218-220.) |
| 1656 | Sauer, R. ... Posch, H. ... | *The Adams Integration Process Applied to Ballistics.* (Ing. Archiv., Vol. 12, No. 3, June, 1941, pp. 158-168.) |
| 1657 | Muhlemann, E. ... | *Effect of Increase in Drag Due to Compressibility on the Tactical Employment of Aircraft.* (Flugwehr und Technik, Vol. 4, No. 8, August, 1942, pp. 208-210.) |
| 1658 | Belleroche, P. ... | *New Type of Military Aircraft on the Russo-German Front.* (La Science et la Vie, No. 300, August, 1942, pp. 89-93.) |

### AERO AND HYDRODYNAMICS.

| | | |
|---|---|---|
| 1642 | Ringleb, F. ... | *The Differential Equations of an Adiabatic Gas Flow and a Flow Shock.* (Deutsche Mathematik, Vol. 5, No. 5, January, 1941, pp. 377-384.) |
| 1651 | Kucharski ... ... | *Positions of Discontinuity in a Moving Continuum.* (Z.A.M.M., Vol. 21, No. 3, June, 1941, pp. 152-161.) |
| 1653 | Schmidt, W. ... | *Turbulent Propagation of a Stream of Heated Air, Pt. I.* (Z.A.M.M., Vol. 21, No. 5, Oct., 1941, pp. 265-278.) |

| Translation Number and Author. | Title and Reference. |
|---|---|
| 1670 Schmidt, W. ... | *Turbulent Propagation of a Stream of Heated Air, Pt. II.* (Z.A.M.M., Vol. 21, No. 6, December, 1941, pp. 351-363.) |

### Engines and Accessories.

| | |
|---|---|
| 1644 Null, v d W. ... | *Some Considerations on the Maximum Pressure Head of Single Stage Radial Aero Engine Superchargers.* (Luftwissen, Vol. 7, No. 5, May, 1940, pp. 170-180.) |
| 1661 Schering, H. ... Vieweg, R. ... ... | *Electrical Methods Applied to the Problem of Bearing Lubrication.* (Zeit. f. ange. Chemie, Vol. 39, 1936, pp. 1,119-1,123.) |
| 1669 Gosslau, F. ... | *Development of High Duty Pistons Based on Modern Researches on Heat Flow.* (A.T.Z., Vol. 44, No. 24, 20/12/41, pp. 613-617.) |

### Aircraft and Airscrews.

| | |
|---|---|
| 1646 —— ... ... ... | *Retractable Aircraft Undercarriage with Emergency Release Gear.* (*German Patent No.* 719,357.) (Flugsport, Vol. 34, No. 9, 29/4/42, p. 115.) |
| 1647 —— ... ... ... | *Retractable Aircraft Undercarriage.* (*German Patent No.* 719,358.) (Flugsport, Vol. 34, No. 9, 29/4/42, p. 115.) |
| 1648 —— ... ... ... | *Retracting Strut for Aircraft.* (*German Patent No.* 719,409.) (Flugsport, Vol. 34, No. 9, 29/4/42, p. 115.) |
| 1649 —— ... ... ... | *Locking Device for Pressure Operated Aircraft Retracting Struts.* (*German Patent No.* 719,410.) (Flugsport, Vol. 34, No. 9, 29/4/42, p. 116.) |
| 1650 —— ... ... ... | *Locking Device for Pressure Operated Aircraft Retracting Struts.* (*German Patent No.* 719,411.) (Flugsport, Vol. 34, No. 9, 29/4/42, p. 116.) |
| 1655 Doepp, v Ph. ... | *Polar Diagrams for Airscrew Design.* (L.F.F., Vol. 13, No. 2, February, 1936, pp. 46-56.) |
| 1665 Reisberg, G. ... Rosler, E. ... ... | *Development of Electrical Lighting in Aircraft.* (Luftwissen, Vol. 8, No. 12, December, 1941, pp. 380-384.) |

### Material and Elasticity.

| | |
|---|---|
| 1643 Opitz, H. ... ... Vito, W. ... ... | *The Performance of Emery Wheels as Affected by Coolants and Lubricants.* (Z.V.D.I., Vol. 86, No. 13-14, 4/4/42, p. 198.) |
| 1660 Forster, F. ... ... Koster, W. ... ... | *The Modulus of Elasticity and Damping—Their Variation with the Condition of Materials.* (Z. f. Metallk., Vol. 29, No. 4, April, 1937, pp. 116-123.) |
| 1663 Mienes, K. ... ... | *New Developments in the Fabrication and Application of Plastics.* (Kunststoffe, Vol. 32, No. 2, February, 1942, pp. 35-40.) |

| TRANSLATION NUMBER AND AUTHOR. | TITLE AND JOURNAL. |
|---|---|
| 1668 Duffek, V. ... ... | *Anodic Deposition of Organic Dyes as a Means of Determining Pores and Mechanical Defects in the Surface Protection of Light Alloy.* (Z. f. Metallk., Vol. 30, No. 8, August, 1938, pp. 265-267.) |
| | INSTRUMENTS. |
| 1643 Rein, H. ... ... | *Physical Methods for Determining Oxygen Concentration.* (Schrift d. L. Akad. f. Luftfahrtforschung, No. 11, 1939, pp. 1-7.) |

https://doi.org/10.1017/S0368393100141033 Published online by Cambridge University Press

## TITLES AND REFERENCES OF ARTICLES AND PAPERS SELECTED FROM PUBLICATIONS REVIEWED IN R.T.P.3.

Requests for further information or translations should be addressed to R.T.P.3, Ministry of Aircraft Production.



### Theory and Practice of Warfare.

*Organisation and Training of Air Forces.*

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 1 | 6024 | G.B. ... ... | *The Case for a Separate Air Force.* (Trade and Engineering Times, Vol. 51, No. 943, Sept., 1942, p. 31.) |
| 2 | 6097 | G.B. ... ... | *Air Force Ranks, Equivalents in Axis and United Nations Air Forces.* (Aeronautics, Vol. 7, No. 5, Dec., 1942, pp. 54-55.) |
| 3 | 7040 | U.S.S.R. ... | *Soviet Air Force After a Year of War.* (N. Wesinov, Aviation, Vol. 41, No. 8, Aug., 1942, pp. 90-92 and 265.) |
| 4 | 7134 | Germany ... | *Leaders of the Luftwaffe (XV).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, p. 702.) |
| 5 | 7273 | Germany ... | *Leaders of the Luftwaffe (XIII).* (Aeroplane, Vol. 63, No. 1,645, 4/12/42, p. 647.) |
| 6 | 7293 | Germany ... | *Training the Luftwaffe.* (V. L. Gruberg, Flight, Vol. 42, No. 1,772, 10/12/42, pp. 639-642.) |
| 7 | 7329 | Germany ... | *Leaders of the Luftwaffe (XIV).* (Aeroplane, Vol. 63, No. 1,646, 11/12/42, p. 675.) |
| 8 | 7335 | Germany ... | *Facilities for University Students Joining the Luftwaffe to Continue Studies.* (Flugsport, Vol. 34, No. 25, 9/12/42, pp. 395-396.) |
| 9 | 7385 | G.B. ... ... | *Bristol Airframe School.* (Flight, Vol. 42, No. 1,774, 24/12/42, pp. 682-683.) |
| 10 | 7398 | Germany ... | *Leaders of the Luftwaffe (XVI).* (Aeroplane, Vol. 63, No. 1,648, 25/12/42, p. 730.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 11 | 7478 | Germany ... | *Training School for Sailing Flight (Ith Hills).* (Der Deutsche Sportflieger, Vol. 9, No. 8, Aug., 1942, p. 174.) |
| 12 | 7486 | Germany ... | *Leaders of the Luftwaffe (XVII).* (Aeroplane, Vol. 64, No. 1,649, 1/1/43, p. 11.) |
| 13 | 7548 | G.B. ... ... | *Bibliography of Published Information (including Translations) on Winter Operation of Military Aircraft, including Transport.* (R.T.P.3, Bibl. No. 76, Nov., 1942, M.A.P.) |
| 14 | 7549 | G.B. ... ... | *Bibliography of Published Information (including Translations) on Training and Organisation of Allied and Enemy Air Forces.* (1, General; 2, Training of Paratroops; 3, Glider Pilot Training; 4, Training Apparatus and Equipment; 5, Training Schools; 6, Training in Combat Tactics; 7, Aerial Gunnery.) (R.T.P.3, Bibliography No. 78, Jan., 1943, M.A.P.) |
| | | | *Military Aircraft—Named Types.* |
| 15 | 6025 | Germany ... | *Focke Wulf F.W. 190 Fighter.* (Trade and Engineering Times, Vol. 51, No. 943, Sept., 1942, p. 35.) |
| 16 | 6026 | Germany ... | *Dornier Do. 217 E-1 Dive Bomber.* (Trade and Engineering Times, Vol. 51, No. 943, Sept., 1942, p. 36.) |
| 17 | 6027 | G.B. ... ... | *Avro Lancaster.* (Trade and Engineering Times, Vol. 51, No. 943, Sept., 1942, p. 33.) |
| 18 | 6047 | U.S.A. ... | *Consolidated B-24 Cargo Version (Photo).* (Am. Av., Vol. 6, No. 8, 15/9/42, p. 3.) |
| 19 | 6049 | U.S.A. ... | *Fairchild Duramold Trainer AT-13.* (Am. Av., No. 6, 15/8/42, p. 38.) |
| 20 | 6054 | G.B. ... ... | *Avro Lancaster.* (Flugsport, Vol. 34, No. 24, 25/11/42, p. 357.) |
| 21 | 6053 | Germany ... | *Macchi M.C. 77 Flying Boat.* (Flugsport, Vol. 34, No. 24, 25/11/42, p. 356.) |
| 22 | 6098 | G.B. ... ... | *Mosquito and Comet (Photographs).* (Aeronautics, Vol. 7, No. 5, Dec., 1942, p. 65.) |
| 23 | 7038 | G.B. ... ... | *Walrus Amphibian.* (F. C. Sheffield, Airc. Prod., Vol. 4, No. 49, Nov., 1942, pp. 639-645.) |
| 24 | 7042 | U.S.A. ... | *Republic P.47 Thunderbolt.* (Aviation, Vol. 41, No. 8, Aug., 1942, pp. 100-105 and 269.) |
| 25 | 7045 | G.B. ... ... | *Report from British Air Front (Review of Modern Types).* (M. V. Cave, Aviation, Vol. 41, No. 8, Aug., 1942, pp. 191-125.) |
| 26 | 7049 | U.S.A. ... | *North American Basic Combat Plane (Sect. Drawing).* (Aviation, Vol. 41, No. 8, Aug., 1942, p. 147.) |
| 27 | 7053 | G.B. ... ... | *Handley Page Halifax.* (Aviation, Vol. 41, No. 8, Aug., 1942, pp. 211-269.) |
| 28 | 7054 | Japan ... | *Silhouette of Japanese Aircraft.* (Aviation, Vol. 41, No. 8, Aug., 1942, p. 213.) |
| 29 | 7079 | U.S.A. ... | *Douglas D.B. 19 Dive Bomber.* (Flugsport, Vol. 37, No. 22, 28/10/42, pp. 327-328.) |
| 30 | 7091 | U.S.A. ... | *Douglas B. 19 Four-Engined Bomber.* (Flugsport, Vol. 37, No. 22, 28/10/42, pp. 328-329.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 31 | 7126 | G.B. ... ... | *De Havilland Mosquito (Photograph).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, p. 694.) |
| 32 | 7129 | G.B. ... ... | *New Model of Spitfire (Photograph).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, pp. 696, 697, 716.) |
| 33 | 7130 | G.B. ... ... | *Bristol Bisley (Blenheim V Modified for Support Work with Ground Troops).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, p. 697.) |
| 34 | 7131 | Italy ... | *Piaggia P. 108B Heavy Bomber (Drawing).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, p. 698.) |
| 35 | 7132 | Germany ... | *Ju. 88 Bomber and Night Fighter (Photograph).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, p. 698.) |
| 36 | 7133 | G.B. ... ... | *Supermarine "Sea Fighter" (Photo).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, p. 700.) |
| 37 | 7137 | U.S.A. ... | *Fairchild Argus I (Recognition Details).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, p. 710.) |
| 38 | 7138 | U.S.A. ... | *Stinson Reliant I (Recognition Details).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, p. 711.) |
| 39 | 7258 | G.B. ... ... | *De Havilland Mosquito (Photographs and Recognition Details).* (Flight, Vol. 42, No. 1,773, 17/12/42, pp. 650-651 and a.) |
| 40 | 7263 | G.B. ... ... | *Blackburn Botha (Recog. Details).* (Flight, Vol. 42, No. 1,773, 17/12/42, p. b.) |
| 41 | 7265 | U.S.A. ... | *Lockheed Lightning Fighter (Photo).* (Flight, Vol. 42, No. 1,773, 17/12/42, p. 671.) |
| 42 | 7268 | U.S.A. ... | *Lockheed Ventura Bomber (Photo).* (Flight, Vol. 42, No. 1,773, 17/12/42, p. 670.) |
| 43 | 7269 | G.B. ... ... | *Airspeed Oxford V Trainer (Recog. Details).* (Aeroplane, Vol. 63, No. 1,645, 4/12/42, p. 638.) |
| 44 | 7271 | Germany ... | *Focke Wulf Kurier Transport (Photo).* (Aeroplane, Vol. 63, No. 1,645, 4/12/42, p. 642.) |
| 45 | 7272 | U.S.A. ... | *Grumman T.F.B. I Avenger Torpedo Bomber (Photo).* (Aeroplane, Vol. 63, No. 1,645, 4/12/42, p. 642.) |
| 46 | 7275 | U.S.A. ... | *Republic P. 47 Thunderbolt Fighter.* (Aeroplane, Vol. 63, No. 1,645, 4/12/42, p. 648.) |
| 47 | 7276 | G.B. ... ... | *Avro Anson I Trainer (Recog. Details).* (Aeroplane, Vol. 63, No. 1,645, 4/12/42, p. 655.) |
| 48 | 7278 | Germany ... | *Henschel 129 Ground Attack Aircraft.* (Flight, Vol. 42, No. 1,771, 3/12/42, p. 607.) |
| 49 | 7282 | G.B. ... ... | *Armstrong Whitworth Whitley (Recog. Details).* (Flight, Vol. 42, No. 1,771, 3/12/42, p. b.) |
| 50 | 7283 | G.B. ... ... | *Spitfires Above 40,000 Feet.* (Flight, Vol. 42, No. 1,771, 3/12/42, p. 612.) |
| 51 | 7286 | U.S.A. ... | *Nose of Lockheed "Lightning" (Photo of Guns).* (Flight, Vol. 42, No. 1,772, 10/12/42, p. 626.) |
| 52 | 7287 | U.S.A. and G.B. ... | *Mustang Army Corps Plane.* (F. Robertson, Flight, Vol. 42, No. 1,772, 10/12/42, pp. 627-630.) |
| 53 | 7289 | G.B. ... ... | *Bristol Blenheim IV and IV F. (Recog. Details).* (Flight, Vol. 42, No. 1,772, 10/12/42, p. a.) |
| 54 | 7290 | U.S.A. ... | *Martin Maryland (Recog. Details).* (Flight, Vol. 42, No. 1,772, 10/12/42, p. b.) |
| 55 | 7291 | Germany ... | *Blohm and Voss B.V. 222 Flying Boat (Drawing).* (Flight, Vol. 42, No. 1,772, 10/12/42, p. 633.) |
| 56 | 7292 | U.S.A. ... | *Aircraft Designation System Used by the U.S. Air Force.* (Flight, Vol. 42, No. 1,772, 10/12/42, p. 638.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 57 | 7296 | G.B. .... | ... *De Havilland 86B (Communication Plan) (Photo).* (Flight, Vol. 42, No. 1,772, 10/12/42, p. 647.) |
| 58 | 7297 | U.S.A. | ... *Vought Sikorsky F4U Shipboard Fighter "Corsair" (Photograph).* (Flight, Vol. 42, No. 1,772, 10/12/42, p. 648.) |
| 59 | 7325 | U.S.A. | ... *Republic Thunderbolt Fighter (Photo).* (Aeroplane, Vol. 63, No. 1,646, 11/12/42, p. 669.) |
| 60 | 7326 | Germany | ... *Junkers Ju. 87D. Dive Bomber (Photo).* (Aeroplane, Vol. 63, No. 1,646, 11/12/42, p. 671.) |
| 61 | 7330 | U.S.A. | ... *North American Mustang (Photo).* (Aeroplane, Vol. 63, No. 1,646, 11/12/46, p. 681.) |
| 62 | 7332 | U.S.S.R. | ... *T.B. 7 Four-Engined Heavy Bomber (Development of T.B. 6B).* (Flugsport, Vol. 34, No. 25, 9/12/42, pp. 389-390.) |
| 63 | 7333 | U.S.S.R. | ... *P.E. 2 Twin-Engined Dive Bomber.* (Flugsport, Vol. 34, No. 25, 9/12/42, pp. 390-391.) |
| 64 | 7367 | U.S.A. | ... *Curtiss "Seagull" Shipborne Observation Plane (Photo).* (U.S. Air Services, Vol. 27, No. 10, Oct., 1942, p. 18.) |
| 65 | 7386 | G.B. ... | ... *Mosquito (General Arrangement Drawing).* (Flight, Vol. 42, No. 1,774, 24/12/42, p. 683.) |
| 66 | 7387 | Italy ... | ... *Cant Z 1007 Bis Bomber (Alcione) (Recog. Details).* (Flight, Vol. 42, No. 1,774, 24/12/42, p. a.) |
| 67 | 7388 | G.B. ... | ... *Airspeed Oxford (Recog. Details).* (Flight, Vol. 42, No. 1,774, 24/12/42, p. b.) |
| 68 | 7395 | U.S.A. | ... *Curtiss SO3C-1 Seagull (Seamew in R.A.F.) Scout Observation Catapult Single Float (Photo).* (Aeroplane, Vol. 63, No. 1,648, 25/12/42, p. 724.) |
| 69 | 7397 | U.S.A. | ... *Douglas SDB-3 Dive Bomber (Photo).* (Aeroplane, Vol. 63, No. 1,648, 25/12/42, p. 726.) |
| 70 | 7399 | G.B. ... | ... *De Havilland Mosquito (Photo).* (Aeroplane, Vol. 63, No. 1,648, 25/12/42, pp. 734-735.) |
| 71 | 7466 | U.S.A. | ... *U.S. Army-Navy Basic Aircraft Type (Photo).* (A. I. Ennis and L. P. Lovetta, S.A.E.J., Vol. 50, No. 11, Nov., 1942, pp. 38-45.) |
| 72 | 7483 | G.B. ... | ... *De Havilland Mosquito (Photo).* (Aeroplane, Vol. 64, No. 1,649, 1/1/43, p. 2.) |
| 73 | 7485 | Germany | ... *Do. 217 E2 (Photo).* (Aeroplane, Vol. 64, No. 1,649, 1/1/43, p. 7.) |
| 74 | 7487 | G.B. ... | ... *Handley Page Harrow as a Troop Transport (Photo).* (Aeroplane, Vol. 64, No. 1,649, 1/1/43, p. 13.) |
| 75 | 7489 | U.S.A. | ... *North American "Mustang" (Recog. Details).* (Aeroplane, Vol. 64, No. 1,649, 1/1/43, p. 18.) |
| 76 | 7490 | Germany | ... *Messerschmitt Me. 109E (Recog. Details).* (Aeroplane, Vol. 64, No. 1,649, 1/1/43, p. 19.) |
| 77 | 7491 | G.B. ... | ... *New Model Spitfire (Photo).* (Aeroplane, Vol. 64, No. 1,649, 1/1/43, p. 23.) |
| 78 | 7493 | Japan | ... *Mitsubishi Navy OB-01 Bomber (Photo).* (Aeroplane, Vol. 64, No. 1,649, 1/1/43, p. 8.) |
| | | | *Military Cargo and Transport Planes.* |
| 79 | 7203 | U.S.A. | ... *Unloading Anti-Tank Gun from Troop Carrier (Photograph).* (Army Ordnance, Vol. 22, No. 135, Nov.-Dec., 1942, p. 492.) |

| ITEM NO. | R.T.P. REF. | | | TITLE AND JOURNAL. |
|---|---|---|---|---|
| 80 | 7264 | G.B. ... | ... | *Transport Aircraft* (*Past Achievements and Future Problems*). (W. Nichols, Flight, Vol. 42, No. 1,773, 17/12/42, pp. 664-667.) |
| 81 | 7280 | Various | ... | *Air Freighters* (*German and Allied Requirements*). (E. N. Bentley, Flight, Vol. 42, No. 1,771, 3/12/42, p. 608.) |
| 82 | 7281 | U.S.A. | ... | *Curtiss Commando Troop Carrier* (*C.W.* 20) (*Recog. Details*). (Flight, Vol. 42, No. 1,771, 3/12/42, p. a.) |
| 83 | 7391 | G.B. ... | ... | *Transport Aircraft II* (*Assisted Take-off, Refuelling, etc.*). (W. Nicholls, Flight, Vol. 42, No. 1,774, 24/12/42, pp. 692-694.) |
| 84 | 7481 | France | ... | *New French Transport Aircraft SO* 30 *and SO* 31. (Der Deutsche Sportflieger, Vol. 9, No. 8, Aug., 1942, p. 180.) |
| | | | | *Gliders.* |
| 85 | 6050 | U.S.A. | ... | *Two-Seater Plywood Plastic Glider.* (Am. Av., Vol. 6, No. 6, 15/8/42, p. 46.) |
| 86 | 7055 | U.S.A. | ... | *Glider Pick-Up* (*Photographs*). (Aviation, Vol. 41, No. 8, Aug., 1942, p. 234.) |
| 87 | 7128 | G.B. ... | ... | *Airspeed "Horsa" Glide* (*Photograph*). (Aeroplane, Vol. 63, No. 1,647, 18/12/42, pp. 695 and 703.) |
| 88 | 7221 | U.S.A. | ... | *Gliders for War* (*including Pick-Up with Tug in Flight*) (*Illustrated*). (H. O. Johansen, Model Aeroplane News, Vol. 27, No. 4, Oct., 1942, pp. 6-7 and 63.) |
| 89 | 7259 | G.B. ... | ... | *Horsa Glider* (*Photo*). (Flight, Vol. 42, No. 1,773, 17/12/42, p. 654.) |
| 90 | 7279 | Germany | ... | *The Gotha Glider.* (Flight, Vol. 42, No. 1,771, 3/12/42, p. 607.) |
| 91 | 7327 | Germany | ... | *German Troop Transport Gliders* (*Photo*). (Aeroplane, Vol. 63, No. 1,646, 11/12/42, p. 672.) |
| 92 | 7479 | Germany | ... | *Auxiliary Motor for High Performance Gliders.* (Der Deutsche Sportflieger, Vol. 9, No. 8, Aug., 1942, p. 175.) |
| | | | | *Armament.* |
| 93 | 5967 | G.B. ... | ... | *Plastic Ammunition Rollers for Aircraft Machine Guns.* (British Plastics, Vol. 14, No. 162, Nov., 1942, p. 358.) |
| 94 | 6051 | U.S.A. | ... | *Bomb Attachment for Consolidated P.B.Y.* (*Photo*). (Am. Av., Vol. 6, No. 6, 15/8/42, p. 50.) |
| 95 | 7052 | Germany | ... | *Fire Power, Range and Gun Arcs of Do.* 17, *Ju.* 88, *Me.* 110 *and He.* 111. (Aviation, Vol. 41, No. 8, Aug., 1942, pp. 196-197.) |
| 96 | 7081 | Germany | ... | *Four-Barrelled A.A. Gun Mounting* (*Photo*). (Flugsport, Vol. 34, No. 22, 28/10/42, p. 335.) |
| 97 | 7084 | Germany | ... | *Gun Mounting for Rearward Fire* (*Pat. Series* 40, *No.* 725,195). (Messerschmitt, Flugsport, Vol. 34, No. 22, 28/10/42, pp. 161-162.) |
| 98 | 7184 | G.B. ... | ... | *Plastic Fuse for Trench Mortars.* (British Plastics, Vol. 14, No. 163, Dec., 1942, pp. 418-419.) |
| 99 | 7331 | G.B. ... | ... | *Effectiveness of Rear Fire.* (Aeroplane, Vol. 63, No. 1,646, 11/12/42, p. 690.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 100 | 7337 | Germany ... | *Gliding Bombs* (*Patent Series* 43, *No.* 726,969). (Hermann, Flugsport, Vol. 34, No. 25, 9/12/42, p. 173.) |
| 101 | 7384 | G.B. ... ... | *Bomb Loading on Mosquito* (*Photo*). (Flight, Vol. 42, No. 1,774, 24/12/42, p. 678.) |
| 102 | 7395 | Germany ... | *Bomb Stowage on Ju.* 88 (*Photo*). (Aeroplane, Vol. 63, No. 1,688, 25/12/42, p. 725.) |
| 103 | 7396 | G.B. ... ... | *Bomb Stowage on Mosquito* (*Photo*). (Aeroplane, Vol. 63, No. 1,648, 25/12/42, p. 726.) |
| 104 | 7440 | Switzerland ... | *Dive Bombing Attack.* (W. Guldimann, Flugwehr und Technik, Vol. 3, No. 5, May, 1941, pp. 103-109.) |
| 105 | 7441 | Switzerland ... | *Range and Bombing Efficiency of Aircraft* (*R.T.P. Trans.* 1,315). (R. Kassowitz, Flugwehr und Technik, Vol. 3, No. 5, May, 1941, pp. 107-109.) |
| 106 | 7448 | Germany ... | *Aircraft Guns, Examples of Early Installations* (1915-1917). (Luftwissen, Vol. 9, No. 9, Sept., 1942, pp. 275-276.) |
| 107 | 7484 | G.B. ... ... | *Ammunition Tracks for Tail Gun of Halifax* (*Photo*). (Aeroplane, Vol. 64, No. 1,649, 1/1/43, p. 5.) |
| | | | *Aircraft Carriers.* |
| 108 | 7480 | G.B. ... ... | *Combined Battleship and Aircraft Carrier* (*British Proposal*). (Der Deutsche Sportflieger, Vol. 9, No. 8, Aug., 1942, pp. 178-179.) |
| 109 | 7488 | G.B. ... ... | *Aircraft Carriers of the Combatants.* (Aeroplane, Vol. 64, No. 1,649, 1/1/43, pp. 14-17.) |
| | | | *Design, Maintenance, Testing.* |
| 110 | 5983 | G.B. ... ... | *Fundamentals of Fighter Design.* (F. H. M. Lloyd, J. Roy. Aeron. Soc., Vol. 46, No. 383, pp. 266-285.) |
| 111 | 6086 | G.B. ... ... | *Hand-Operated Lifting Jacks for Aeroplanes.* (Engineering, Vol. 154, No. 4,011, 27/11/42, p. 426.) |
| 112 | 7322 | G.B. ... ... | *Aircraft Testing During the War.* (Times Trade and Engineering, Vol. 52, No. 945, Nov., 1942, pp. 31-32.) |
| 113 | 7336 | Germany ... | *Heat Insulation for Pressure Cabins* (*Pat. Series* 43, *No.* 726,935). (Junkers, Flugsport, Vol. 34, No. 25, 9/12/42, p. 173.) |
| 114 | 7342 | Germany ... | *Snap Fastenings for Aircraft Cowlings* (*Pat. Series* 43, *No.* 726,758). (Heinkel, Flugsport, Vol. 35, No. 25, 9/12/42, p. 176.) |
| 115 | 7366 | U.S.A. ... | *Superiority of American Fighter Planes.* (E. Rickenbacker, U.S. Air Services, Vol. 27, No. 10, Oct., 1942, pp. 13-16.) |
| 116 | 7368 | U.S.A. ... | *Critics of American Aircraft—Aeronautical Chamber Reply.* (U.S. Air Services, Vol. 27, No. 10, Oct., 1942, p. 34.) |
| 117 | 7400 | G.B. ... ... | *On Serviceability* (*Maintenance at the Front*). (M. Gray, Aeroplane, Vol. 63, No. 1,638, 25/12/42, pp. 736-737.) |
| 118 | 7450 | Germany ... | *Washing of Parachutes.* (Der Adler, No. 22, 3/11/42, p. 687.) |
| 119 | 7467 | U.S.A. ... | *Aircraft Maintenance in North Africa.* (R. Toland, S.A.E.J., Vol. 50, No. 11, Nov., 1942, pp. 46-48.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 120 | 7468 | U.S.A. ... | *Aircraft Design and Combat Performances.* (N. F. Silsbee, S.A.E.J., Vol. 50, No. 11, Nov., 1942, pp. 495-496.) |
| | | | *A.R.P.* |
| 121 | 6006 | U.S.A. ... | *Laboratory Testing of Mg. Incendiary Bomb Extinguishers.* (M. Fleischer and J. J. Fahey, Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 17, 10/9/42, p. 1,110.) |
| 122 | 7012 | G.B. ... ... | *Some Aspects of the Work of the Gas Identification Services.* (G. W. Ferguson, J. Institute of Chemistry, Pt. IV, Aug., 1942, pp. 166-178.) |
| 123 | 7124 | G.B. ... ... | *Civil Defence Against War Gases.* (Nature, Vol. 150, No. 3,814, 5/12/42, pp. 642-643.) |
| 124 | 7195 | G.B. ... ... | *Dennis No. 3 Two-Stage Centrifugal Pump (Trailer Fire Unit).* (Autom. Eng., Vol. 32, No. 431, Dec., 1942, pp. 511-517.) |
| 125 | 7373 | U.S.A. ... | *Air Raid Precautions for Chemical Firms.* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 20, 25/10/42, p. 1,318.) |

## Aero- and Hydrodynamics.

*Aerodynamics.*

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 126 | 6058 | Germany ... | *Aerodynamics of Aircraft Models (Aerofoil Measurements Covering Re 2,100-168,000) (Book Review).* (F. W. Schmitz, Flugsport, Vol. 34, No. 24, 25/11/42, p. 367.) |
| 127 | 7139 | Japan ... | *Application of the Hodograph Method to the Flow of a Compressible Fluid Past a Circular Cylinder.* (K. Tamada, Proc. of the Physico-Mathematical Society of Japan, Vol. 22, No. 3, March, 1940, pp. 208-219.) |
| 128 | 7156 | Germany ... | *Temperature in Shock Waves and Their Possible Connection with the Luminosity of Meteors.* (H. Muraour, Z.G.S.S., Vol. 37, No. 9, Sept., 1942, pp. 166-169.) |
| 129 | 7442 | G.B. and U.S.A. ... | *The Mutual Interferences Between Engine Nacelle and Wing (British and U.S.A. Investigations).* (E. Billeter, Flugwehr und Technik, Vol. 3, No. 5, May, 1941, pp. 107-109.) |
| 130 | 7446 | U.S.A. ... | *The Compressible Potential Flow Past Elliptic Symmetrical Cylinders at Zero Angle of Attack and with No Circulation.* (H. Wendt and W. Hantzsche, L.F.F., Vol. 18, No. 9, Sept. 20th, 1941, pp. 311-316. R.T.P. Trans. No. 1,354 and T.M. 1,030, Oct., 1942.) |
| 131 | 7451 | Germany ... | *Comparison of Various Methods for Determining Flight Speed at Great Altitudes.* (R. Schmidt, Luftwissen, Vol. 9, No. 9, Sept., 1942, pp. 270-275.) |
| 132 | 7460 | U.S.A. ... | *Wind Tunnel Investigation of Diving Brakes.* (D. Fuchs, L.F.F., Vol. 15, No. 1 and 2, 20/1/38, pp. 19-27. R.T.P. Trans. No. 670 and T.M. 1,023, Nov., 1942.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 133 | 7520 | G.B. ... | ... *Diagrams for Calculation of Airfoil Lattices. (A. Betz, Ingenieur Archiv., Vol. 11, No. 3, Sept., 1931.) (R.T.P. Translation T.M. 1,022.)* |

*Hydrodynomics.*

| | | | |
|---|---|---|---|
| 134 | 7433 | G.B. ... | ... *Theory of Stress Due to Collapse of Vapour Bubbles in a Liquid (Cavitation Erosion).* (R. S. Silver, Engineering, Vol. 154, No. 4,015, 25/12/42, pp. 501-502.) |
| 135 | 7443 | G.B. ... | ... *Sea Waves (Water Movement).* P. S. H. Unna, Nature, Vol. 150, No. 3,811, 14/11/42, pp. 581-582.) |

## Aircraft and Accessories.

*Design and Performance.*

| | | | |
|---|---|---|---|
| 136 | 5975 | G.B. ... | ... *Timm Plastic/Wood Aircraft.* (British Plastics, Vol. 14, No. 162, Nov., 1942, pp. 336-337.) |
| 137 | 6035 | G.B. ... | ... *Kinetic Energy in Partial Climbs and Effect on Performance Calculation.* (A. G. Hurn, Airc. Eng., Vol. 14, No. 165, Nov., 1942, p. 319.) |
| 138 | 6048 | U.S.A. | ... *Flying Wing Developments.* (E. J. Foley, Am. Av., Vol. 6, No. 6, 15/8/42, pp. 34, 44, 46.) |
| 139 | 7120 | G.B. ... | ... *Weight Reduction in Aeroplane by Use of Needle Bearings.* (R. H. White, Bearing Engineer, Vol. 2, No. 2, April, 1942, pp. 6 and 8.) |
| 141 | 7192 | G.B. ... | ... *Laminated Paper Plastic for Airplane Wing Tips.* (British Plastics, Vol. 14, No. 163, Dec., 1942, pp. 404/406 and 422.) |
| 142 | 7401 | G.B. ... | ... *The First Aeroplane.* (Aeroplane, Vol. 63, No. 1,648, 25/12/42, p. 746.) |
| 143 | 7432 | G.B. ... | ... *Aeronautics in 1942.* (Engineer, Vol. 175, No. 4,538, 1/1/43, pp. 7-9.) |
| 144 | 7392 | G.B. ... | ... *The First Aeroplane.* (B. Jablensky, Aeroplane, Vol. 64, No. 1,649, 1/1/43, p. 28.) |
| 145 | 7465 | U.S.A. | ... *Flight Testing Equipment for Large Aircraft (Digest).* (W. T. Dickenson, S.A.E.J., Vol. 50, No. 11, Nov., 1942, pp. 37 and 60.) |

*Airlines and Airport Operations.*

| | | | |
|---|---|---|---|
| 146 | 6005 | G.B. ... | ... *Aerodrome Construction (Report of Select Committee on National Expenditure).* (Engineer, Vol. 174, No. 4,532, 20/11/42, p. 424.) |
| 147 | 6034 | G.B. ... | ... *Air Line Engineering Management.* (I. Lusty, Airc. Eng., Vol. 14, No. 165, Nov., 1942, pp. 315-316.) |
| 148 | 6096 | G.B. ... | ... *Drop Doors for Air Hangars.* (Aeronautics, Vol. 7, No. 5, Dec., 1942, p. 43.) |
| 149 | 7016 | G.B. ... | ... *Aerodrome Abstract (1942), Vol. 1, No. 5 (Abstract 76-95).* (J. Inst. Civil Engs., Vol. 19, No. 1, Nov., 1942, pp. 10-16.) |

| ITEM NO. | R.T.P. REF. | | | TITLE AND JOURNAL. |
|---|---|---|---|---|
| 150 | 7041 | U.S.A. | ... | *The Future of Water Based Aeroplane (Part III).* (F. T. Courtney, Aviation, Vol. 41, No. 8, Aug., 1942, pp. 93-95 and 252.) |
| 151 | 7047 | U.S.A. | ... | *Weight Control in Airline Operation,* (C. Froesch, Aviation, Vol. 41, No. 8, Aug., 1942, pp. 201-202 and 285.) |
| 152 | 7328 | U.S.A. | ... | *Glenn Martin Flying Boat "Mars" (Photo).* (Aeroplane, Vol. 63, No. 1,646, 11/12/42, p. 675.) |
| 153 | 7470 | U.S.A. | ... | *Fuel Consumption from the Airlines Viewpoint.* (M. G. Beard, S.A.E.J., Vol. 50, No. 11, Nov., 1942, pp. 484-491.) |
| | | | | *Airscrews and Helicopters.* |
| 154 | 6059 | Germany | ... | *Airscrew Spinner Providing Hot Air Circulation Over the Hub (Pat. Series 42, No. 726,328).* (Junkers, Flugsport, Vol. 34, No. 24, 25/11/42, p. 169.) |
| 155 | 6060 | Germany | ... | *Device for Simultaneous Automotive Pitch Control of Non-Coaxial Airscrews (Pat. Series 42, No. 725,100).* (Junkers, Flugsport, Vol. 34, No. 24, 25/11/42, pp. 169.) |
| 156 | 6061 | Germany | ... | *Electrical Pitch Setting Indicator for Variable Pitch Airscrews (Pat. Series 42, No. 725,407).* (Siemens, Flugsport, Vol. 34, No. 24, 25/11/42, p. 170.) |
| 157 | 6062 | Germany | ... | *Device for Synchronising Airscrew Speeds on Multi-Engined Aircraft by Means of a Magnetic Field Rotating at Constant Speeds (Pat. Series 42, No. 725,197).* (Seppeler, Flugsport, Vol. 34, No. 24, 25/11/42, pp. 170-171.) |
| 158 | 6063 | Germany | ... | *Variable Pitch Airscrew (Operated by Air-Driven Rotor (Pat. Series 42, No. 725,853).* (Argus, Flugsport, Vol. 34, No. 24, 25/11/42, p. 171.) |
| 159 | 6064 | Germany | ... | *Direction of Rotation of Airscrew Determined by Relative Position of Cockpit and Engine Nacelle in Unsymmetrical Aircraft (Pat. Series 42, No. 725,508).* (Blohm and Voss, Flugsport, Vol. 34, No. 24, 25/11/42, p. 172.) |
| 160 | 7035 | U.S.A. | ... | *Steel Tube Airscrew Blades (American Prop. Corp.).* (Airc. Prod., Vol. 4, No. 49, Nov., 1942, p. 661.) |
| 161 | 7102 | G.B. ... | ... | *Stress Measurement in Airscrew Blades.* (K. R. Boydell, Airc. Prod., Vol. 4, No. 50, Dec., 1942, pp. 687-689.) |
| 162 | 7109 | G.B. ... | ... | *Hydulignum Airscrew Blades (Thermoplastic Bond).* (Airc. Prod., Vol. 4, No. 50, Dec., 1942, p. 730.) |
| 163 | 7261 | U.S.A. | ... | *Single Rotor Blade for Autogiros (U.S.A. Pat. No. 2,297,815).* (Flight, Vol. 42, No. 1,773, 17/12/42, p. 654.) |
| 164 | 7274 | G.B. ... | ... | *Multi-Bladed Airscrews.* (A. V. Cleaver, Aeroplane, Vol. 63, No. 1,645, 4/12/42, pp. 648-649.) |
| 165 | 7285 | U.S.A. | ... | *Sikorsky Amphibian Helicopter V.S. 300 (Photo).* (Flight, Vol. 42, No. 1,772, 10/12/42, p. 626.) |
| 166 | 7323 | G.B. ... | ... | *Advances in Airscrew Design.* (Times Trade and Engineering, Vol. 52, No. 945, Nov., 1942, pp. 33-34.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 167 | 7343 | Germany ... | *Automatic Blade Incidence for Helicopters to Ensure Constant Engine Torque* (*Pat. Series* 43, *No.* 726,978). (Focke, Flugsport, Vol. 34, No. 25, 9/12/42, p. 176.) |
| 168 | 7482 | France ... | *French Helicopter S.E.* 700. (Der Deutsche Sportflieger, Vol. 9, No. 8, Aug., 1942, p. 180.) |
| | | | *Control Surface Operation (Patents).* |
| 169 | 6065 | Germany ... | *Operation of Several Hand Pumps at Will by Means of a Single Operating Mechanism* (*Pat.* 42, *No.* 725,873). (Arado, Flugsport, Vol. 34, No. 24, 25/11/42, p. 172.) |
| 170 | 7083 | Germany ... | *Spoiler Flap (Combined with Air Ejector)* (*Pat. Series* 40, *No.* 725,194). (A.V.A. (Goettingen), Flugsport, Vol. 34, No. 32, 28/10/42, p. 161.) |
| 171 | 7085 | Germany ... | *Device for Transmission of Control Rods Through Attachments on Aircraft of the Quick Release Type* (*Pat. Series* 40, *No.* 725,306). (Henschel, Flugsport, Vol. 34, No. 22, 28/10/42.) |
| 172 | 7086 | Germany ... | *Application of Rotors to Obtain Lateral Control on Air or Marine Craft* (*Pat. Series* 40, *No.* 724,796). (Holst, Flugsport, Vol. 34, No. 22, 28/10/42, p. 162.) |
| 173 | 7089 | Germany ... | *Device for Automatically Locking Control Piston in Hydraulic or Pneumatic Circuits* (*Pat. Series* 40, *No.* 724,315). (V.D.M., Flugsport, Vol. 34, No. 22, 28/10/42, p. 164.) |
| 174 | 7338 | Germany ... | *Split Flap (Continued Air Brake and Landing Flap)* (*Pat. Series* 43, *No.* 726,492). (Heinkel, Flugsport Vol. 34, No. 25, 9/12/42, pp. 173-174.) |
| 175 | 7339 | Germany ... | *Foolproof Locking Device for Aircraft Control Surfaces* (*Pat. Series* 43, *No.* 726,648). (Junkers, Flugsport, Vol. 34, No. 25, 9/12/42, pp. 174-175.) |
| 176 | 7340 | Germany ... | *Landing Flap Control* (*Pat. Series* 43, *No.* 726,492). (Heinkel, Flugsport, Vol. 34, No. 25, 9/12/42, p. 174.) |
| 177 | 7341 | Germany ... | *Operation of Landing and Brake Flaps* (*Pat. Series* 43, *No.* 726,493). (Heinkel, Flugsport, Vol. 34, No. 25, 9/12/42, p. 174.) |
| 178 | 7344 | Germany ... | *Hydraulic Operation of Landing Flaps* (*Pat. Series* 43, *No.* 726,934). Teves, Flugsport, Vol. 34, No. 25, 9/12/42, p. 175.) |
| 179 | 7390 | U.S.A. ... | *Constant Tension Control Cables* (*U.S.A. Pat.* 2,298,611). (Flight, Vol. 42, No. 1,774, 24/12/42, p. 691.) |
| 180 | 7392 | G.B. ... ... | *Hydraulic Remote Controls* (*Messier*). (Flight, Vol. 42, No. 1,774, 24/12/42, p. 695.) |
| | | | *Undercarriages.* |
| 181 | 7087 | Germany ... | *Spring Mounting for Aircraft Wheels* (*Pat. Series* 40, *No.* 724,313). (V.D.M., Flugsport, Vol. 34, No. 22, 28/10/42, p. 163.) |
| 182 | 7088 | Germany ... | *Cover Plates for Retractable Undercarriage Recess* (*Pat. Series* 40, *No.* 723,664). (Henschel, Flugsport, Vol. 34, No. 22, 28/10/42, p. 163.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 183 | 7090 | Germany ... | *Device for Jettisoning of Certain Aircraft Parts such as Undercarriage (Pat. Series* 40, *No.* 722,627). (Fieseler, Flugsport, Vol. 34, No. 22, 28/10/42, p. 164.) |

*Maintenance and Ground Equipment.*

| | | | |
|---|---|---|---|
| 184 | 7547 | G.B. ... ... | *Bibliography of Published Information (including Translations) on Maintenance and Ground Equipment.* (1, General; 2, Fuelling-up; 3, Electrical Equipment; 4, Hydraulic System.) (R.T.P.3, Bibliography No. 75, Nov., 1942, Ministry of Aircraft Production.) |

## Engines and Accessories.

*Engine Types.*

| | | | |
|---|---|---|---|
| 185 | 6031 | G.B. ... ... | *Merlin XX Power Plant Installation.* (Airc. Eng., Vol. 41, No. 165, Nov., 1942, pp. 310-311.) |
| 186 | 7046 | Japan ... | *Design Details of Mitsubishi Kinsei Engine.* (W. G. Ovens, Aviation, Vol. 41, No. 8, Aug., 1942, pp. 110-117 and 270.) |
| 187 | 7080 | Germany ... | *Mercedes Benz Aircraft Aero Engines Since* 1888 (*Review of Types*). (Flugsport, Vol. 37, No. 22, 28/10/42, pp. 329-334.) |
| 188 | 7105 | G.B. ... ... | *Interchangeable Power Plants (Hercules and Merlin).* (Airc. Prod., Vol. 4, No. 50, Dec., 1942, pp. 705-706.) |
| 189 | 7127 | G.B. ... ... | *Merlin* 61 *Aero Engine.* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, pp. 695-696 and 705-708.) |
| 190 | 7135 | G.B. ... ... | *Merlin XX (Sectional Drawing).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, pp. 706-707.) |
| 191 | 7136 | G.B. ... ... | *Merlin Engine Installations (Spitfire* 9, *Fairey Fulmar I, Wellington II, Halifax, Hurricane IIc, Kittyhawk II, Whitley V, Lancaster I).* (Aeroplane, Vol. 63, No. 1,647, 18/12/42, p. 709.) |
| 192 | 7262 | G.B. ... ... | *Rolls Royce Merlin* 61. (Flight, Vol. 42, No. 1,773, 17/12/42, pp. 655-659.) |
| 193 | 7204 | U.S.A. ... | *New Forged Cylinder Heads of Cyclone Engines.* (P. W. Brown, Army Ordnance, Vol. 22, No. 135, Nov.-Dec., 1942, pp. 518-521.) |
| 194 | 7277 | Germany ... | *German Radial Engines (B.M.W. Bramo Fafnir).* (Flight, Vol. 42, No. 1,771, 3/12/42, pp. 603-607.) |
| 195 | 7311 | G.B. ... ... | *Rolls Royce Merlin* 61 *Engine.* (Engineer, Vol. 174, No. 4,536, 18/12/42, pp. 495-497.) |
| 196 | 7334 | Germany ... | *Details of Automatic Control Unit of Ju.* 211 *Petrol Injection Engine.* (Flugsport, Vol. 34, No. 25, 9/12/42, pp. 391-395.) |
| 197 | 7381 | U.S.A. ... | *B.M.W.* 801*A Aero Engine.* (Autom. Ind., Vol. 87, No. 8, 15/10/42, pp. 20-24.) |
| 198 | 7469 | Germany ... | *Design Features of Junkers Ju.* 211*B Aircraft Engine (with Test Data on Injection Equipment and Supercharger).* (S. Oldberg and T. M. Ball, S.A.E.J. (Transaction), Vol. 50, No. 11, Nov., 1942, pp. 465-483.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 199 | 6055 | Germany ... | *Infinitely Variable Gear for Incorporation Between Governor and Fuel Pump Delivery (Pat. No.* 710,463). (Junkers, Flugsport, Vol. 34, No. 24, 25/11/42, pp. 358-359.) |

*Turbines and Compressors.*

| | | | |
|---|---|---|---|
| 200 | 7099 | Germany ... | *Compressed Air Locomotive.* (Progressus, Vol. 7, No. 1, Jan., 1942, pp. 20-23.) |
| 201 | 7294 | G.B. ... ... | *Gas Turbine for Aircraft.* (A. Hudson, Flight, Vol. 42, No. 1,772, 10/12/42, p. 644.) |
| 202 | 7295 | G.B. ... ... | *Boost Pressure Variation with Engine Speed.* (F. Ashley, Flight, Vol. 42, No. 1,772, 10/12/42, p. 644.) |
| 203 | 7393 | G.B. ... ... | *Variation of Boost Pressure with Speed.* (L. S. Greenland, Flight, Vol. 42, No. 1,774, p. 698.) |
| 204 | 7426 | G.B. ... ... | *The First Gas Turbine Locomotive (Discussion).* (A. Meyer, Engineering, Vol. 155, No. 4,016, 1/1/43, pp. 15-16.) |
| 205 | 7430 | G.B. ... ... | *A New Rotary Compressor (Discussion).* (A. J. R. Lysholm, Engineering, Vol. 155, No. 4,016, 1/1/42, p. 16.) |
| 206 | 7438 | G.B. ... ... | *The First Gas Turbine Locomotive (with Discussion).* (A. Meyer, Engineering, Vol. 174, No. 4,537, 25/12/42, pp. 521-523 and 524-527.) |

*Filters and Hoods.*

| | | | |
|---|---|---|---|
| 207 | 7260 | G.B. ... ... | *Warming Hood for Merlin 61 (Photo).* (Flight, Vol. 42, No. 1,773, 17/12/42, p. 654.) |
| 208 | 7464 | U.S.A. ... | *Requirements for Carburettor Air Filters for Aircraft Engines (Digest).* (W. D. Cannon, S.A.E.J., Vol. 50, No. 11, Nov., 1942, p. 37.) |

*Testing.*

| | | | |
|---|---|---|---|
| 209 | 7030 | U.S.A. ... | *Aircraft Engine Testing by American Firms.* (Airc. Prod., Vol. 4, No. 49, November, 1942, pp. 635-636.) |
| 210 | 7101 | G.B. ... ... | *Recovery of Engine Power.* (Airc. Prod., Vol. 4, No. 50, Dec., 1942, p. 685.) |
| 211 | 7182 | U.S.A. ... | *Cold-Room Test Cells for Cyclone Engines.* (Trade Winds, Oct., 1942, pp. 8-9.) |

*Piston, Cylinder Heads, and Bearings.*

| | | | |
|---|---|---|---|
| 212 | 6078 | G.B. ... ... | *Mechanism of Metallic Friction.* (Metal Industry, Vol. 61, No. 20, 13/11/42, p. 309.) |
| 213 | 7078 | Germany ... | *Frictional Losses in Ships' Propeller Shafts.* (W.R.H., Vol. 23, No. 7, 1/4/42, pp. 108-109.) |
| 214 | 7118 | Germany ... | *The Utilisation of Substitute Steels in the Construction of Mahle Composite Pistons.* (Aluminium, Vol. 24, No. 9, Sept., 1942, pp. 322-323.) |
| 215 | 7202 | U.S.A. ... | *Oil Engine Bearings (Materials).* (A. B. Willi, Autom. Eng., Vol. 32, No. 431, Dec., 1942, pp. 535-542.) |
| 216 | 7404 | U.S.A. ... | *Effect of Surface Roughness on Journals (from A.S.M.E.).* (R. W. Dayton and others, Mech. World, Vol. 112, No. 2,921, 25/12/42, pp. 601-603.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 217 | 7300 | G.B. ... | ... *The Physical Basis of Seizure.* (E. A. Smith, Engineering, Vol. 154, No. 4,014, 18/12/42, pp. 481-482.). |
| 218 | 6022 | U.S.A. | ... *The Role of Surface Chemistry and Profile in Boundary Lubrication.* (J. T. Burwell, S.A.E.J., Vol. 50, No. 10, Oct., 1942, pp. 450-457.) |
| 219 | 7121 | G.B. ... | ... *Seals for Anti-Friction Bearings (I).* (R. T. Dunlop, Bearing Engineer, Vol. 2, No. 3, June, 1942, pp. 3 and 8.) |
| 220 | 7123 | G.B. ... | ... *Seals for Anti-Friction Bearings (II).* (R. T. Dunlop, Bearing Engineer, Vol. 2, No. 4, Aug., 1942, pp. 6 and 8.) |

## Fuels and Lubricants.

*Knock Rating.*

| | | | |
|---|---|---|---|
| 221 | 6023 | U.S.A. | ... 1941 *C.F.R. Road Detonation Tests.* (J. M. Campbell and others, Vol. 50, No. 10, Oct., 1942, pp. 458-464.) |
| 222 | 7141 | Germany | ... *German Co-operative Fuel Research—Improvement in Method of Knock Research.* (Z.V.D.I., Vol. 86, No. 43-44, 31/10/42, pp. 651-652.) |
| 223 | 7232 | U.S.A. | ... *Effect of Altitude on Knock Rating in C.F.R. Engine.* (D. B. Brooks, Bur. of Stands. J. Research, Vol. 28, No. 6.) |

*Oxidation and Combustion.*

| | | | |
|---|---|---|---|
| 224 | 5984 | G.B. ... | ... *Catalysts—Ancient and Modern (with Special Reference to Microbiological Processes).* (A. J. V. Underwood, Chem. and Ind., Vol. 61, No. 47, 21/11/42, pp. 476-478.) |
| 225 | 7167 | U.S.S.R. | ... *Thermal Theory of Combustion and Explosives.* (N. N. Semenov, Progress of Physical Science, U.S.S.R., Vol. 23, No. 3, 1940, pp. 251-292.) (R.T.P. Trans. No. T.M. 1,024.) |
| 226 | 7168 | U.S.S.R. | ... *Self-Ignition and Combustion of Gases.* (A. S. Sokalic, Progress of Physical Science, U.S.S.R., Vol. 23, No. 3, 1940, pp. 209-250,) (R.T.P. Trans. No. T.M. 1,025.) |
| 227 | 7375 | U.S.A. | ... *Ethylene Oxide Explosions (High Pressure Reactions).* (Ind. and Eng. Chem (News Ed.), Vol. 20, No. 20, 25/10/42, p. 1,318.) |
| 228 | 7372 | U.S.A. | ... *Carbon Black Obtained from Gas Explosions (Natural Gas and Chlorine).* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 20, 25/10/42, p. 1,317.) |
| 229 | 7405 | G.B. ... | *Calcium Carbide Manufacture and Acetylene (Flow-sheet of Process).* (Mech. World, Vol. 112, No. 2,921, 25/12/42, pp. 609-610.) |

*Oil Testing and Recovery.*

| | | | |
|---|---|---|---|
| 230 | 5964 | U.S.A. | ... *Oxidation Characteristics of Lubricating Oils (Stability and Chemical Composition).* G. H. von Fuchs and H. Diamond, Ind. and Eng. Chem (Ind. Ed.), Vol. 34, No. 8, Aug., 1942, pp. 927-937.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 231 | 6013 | U.S.A. ... | *Determination of Water in Insulating Oil (Manometric. Method).* (R. N. Evans and J. E. Davenort, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 9, 15/9/42, pp. 732-733.) |
| 232 | 6019 | U.S.A. ... | *The Testing of Heavy Duty Motor Oils (with Discussion).* (H. C. Mougey and J. A. Moller, S.A.E.J., Vol. 50, No. 10, Oct., 1942, pp. 417-438.) |
| 233 | 7201 | G.B. ... ... | *Used Oil Recovery.* (Autom. Eng., Vol. 32, No. 431, Dec., 1942, p. 534.) |
| 234 | 7306 | G.B. ... ... | *Magnetic Filter for Lubricants.* (Engineering, Vol. 154, No. 4,013, 11/12/42, p. 466.) |
| 235 | 7317 | U.S.A. ... | *Extraction of Metallic Constituents from Used Lubricating Oils (Alternative to Ash Method).* (E. P. Rittershausen and R. T. De Gray, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 10, 16/10/42, pp. 806-807.) |
| 236 | 7453 | U.S.A. ... | *Viscosity and Pole Height of Ubbelode.* (S. S. Kurtz, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 6, June, 1942, p. 770.) |
| | | | *Vapour Lock and Fire Risk.* |
| 237 | 7389 | G.B. ... ... | *Vapour Lock During Rapid Ascent.* (D. C. Greenwood, Flight, Vol. 42, No. 1,774, 24/12/42, pp. 690-691.) |
| 238 | 7454 | U.S.A. ... | *Electrical Charge Produced by Flowing Petrol.* (S. S. Mackeown and V. Wouk, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 6, June, 1942, pp. 659-664.) |
| 239 | 7455 | U.S.A. ... | *Guarding Against the Flammable Liquid Fire Hazard.* (C. L. Griffin, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 6, June, 1942, pp. 664-669.) |
| | | | *Liquid Fuels and Abstracts.* |
| 240 | 6018 | U.S.A. ... | *Densities of Liquefied Gases (Propane Propylene, Isobutane, Pentane, etc.).* (Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 10, Oct., 1942, pp. 1,240-1,243.) |
| 241 | 7065 | G.B. ... ... | *Fuel Research Board (Abstracts).* (Summary for Two Weeks ending 21st and 28th, November.) |

## Materials and Elasticity.

| | | | |
|---|---|---|---|
| | | | *Elastic Theory.* |
| 242 | 5958 | U.S.A. ... | *Metal Powder Fillings as a Vibration Damper (Application to Electric Contacts).* (Sci. Am., Vol. 167, No. 5, Nov., 1942, p. 207.) |
| 243 | 5985 | U.S.A. ... | *Rectangular Plate Loaded Along Two Adjacent Edges by Couples in its Own Plane.* (W. R. Osgood, J. Res. Bur. of Stands., Vol. 28, No. 2, Feb., 1942, pp. 159-163.) |
| 244 | 6030 | G.B. ... ... | *Built-in and Continuous Beams.* (L. P. Dudley, Airc. Eng., Vol. 41, No. 165, Nov., 1942, pp. 306-309 and 319.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 245 | 7013 | G.B. ... | ... *A Model Illustrating Intercrystalline Boundaries and Plastic Flow in Metals.* (L. Bragg, Rev. of Scientific Insts., Vol. 19, No. 10, Oct., 1942, pp. 148-150.) |
| 246 | 7018 | G.B. ... | ... *Tensile Strength of Water and Liquid Structure Theory.* (R. S. Silver, Nature, Vol. 150, No. 3,812, 21/11/42, p. 605.) |
| 248 | 7176 | U.S.A. | ... *Method of Exciting Resonant Vibrations in Mechanical Systems.* (L. B. Tuckerman, Bureau of Standards Journal of Research, Vol. 10, 1933, p. 659.) |
| 249 | 7181 | U.S.A. | ... *Determination of Stresses from Strains on Three Intersecting Gauge Lines.* (W. R. Osgood and D. W. Querfeld, Bureau of Standards Journal of Research, Vol. 10, 1933, pp. 615-692.) |
| 250 | 7231 | U.S.A. | ... *Perforated Cover Plates for Steel Columns.* (A. H. Stang and M. Greenspan, Bur. Stands. J. Res., Vol. 28, No. 6, June, 1942, pp. 669-712.) |
| 251 | 7345 | Germany | ... *Comparative Strength of Materials (III) (Design Data for Replacement of Materials in a Given Structure).* (P. Schwerber, Aluminium, Vol. 24, No. 11, Nov., 1942, pp. 377-381.) |
| 252 | 7355 | U.S.S.R. | ... *Metal Research in the U.S.S.R. (Hardness and Plasticity).* (Metal Industry, Vol. 61, No. 24, 11/12/42, p. 380.) |
| 253 | 7403 | G.B. ... | ... *Vibration of Presses.* (Mech. World, Vol. 112, No. 2,921, 25/12/42, p. 612.) |
| | | | *Iron and Steel.* |
| 255 | 5980 | U.S.A. | ... *Elastic Properties of Some Alloy Cast Irons.* (A. I. Krynitsky and C. M. Saager, Vol. 28, No. 1, Jan., 1942, pp. 73-93.) |
| 256 | 5993 | U.S.A. | ... *Tensile Elastic Properties of Nickel, Copper, Open-Hearth Iron and Typical Steels (R.P. 1,459).* (D. J. McAdam and R. W. Mebs, J. Res. Bur. Stands., Vol. 28, No. 3, March, 1942, pp. 379-400.) |
| 257 | 6003 | G.B. ... | ... *Sponge Iron Process.* (Engineer, Vol. 174, No. 4,532, 20/11/42, p. 417.) |
| 258 | 6080 | U.S.A. | ... *Creep Rates of Cold Drawn Ni.-Cn. Alloy (Monel).* (P. A. Bennett and D. J. McAdam, J. Res. Bureau of Stands., Vol. 28, No. 4, April, 1942, pp. 417-437.) |
| 259 | 6083 | U.S.A. | *Tensile and Compressive Properties of Some Stainless Steel Sheets.* (C. S. Aitchison and others, J. Res. Bureau of Stands., Vol. 28, No. 4, April, 1942, pp. 499-567.) |
| 260 | 6087 | U.S.A. | ... *Influence of Initial Structure and Rate of Heating on the Austenitic Grain Size of 5 per cent. C. Steels and Iron—Carbon Alloy.* (T. G. Digger and S. S. Rosenberg, J. Res. Bureau of Stands., Vol. 29, No. 1, July, 1942, pp. 33-40.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 261 | 7043 | G.B. ... | ... *Specifications for Aircraft Stainless Steels.* (Aviation, Vol. 41, No. 8, Aug., 1942, pp. 151-153.) |
| 262 | 7058 | Germany | ... *Din Specification* 1,691 *Grey Cast Iron.* (H. Jungbluth and F. Pardun, Stahl und Eisen, Vol. 62, No. 45, 5/11/42, pp. 941-946.) |
| 263 | 7069 | U.S.A. | ... *Carbon Molybdenum Steels* ("*A.M.O.L.A.*"). (F. E. McCleary, Metal Progress, Vol. 43, No. 3, Sept., 1942, pp. 386-388.) |
| 264 | 7077 | U.S.A. | ... *Properties of High Purity Iron.* (H. E. Cleaves and J. M. Hiegel, J. Res. Bureau of Stands., Vol. 28, No. 5, May, 1942, pp. 643-667.) |
| 265 | 7197 | G.B. ... | ... *Low Alloy Steels (Characteristics and Potentialities).* (Autom. Eng., Vol. 32, No. 431, Dec., 1942, pp. 543-545.) |
| 266 | 7198 | U.S.A. | ... *Annealing Steel in an Atmosphere of* $H_2$. (Autom. Eng., Vol. 32, No. 431, Dec., 1942, p. 527.) |
| 267 | 7244 | G.B. ... | ... *Automatic Steel Hardening Machine.* (Engineering, Vol. 154, No. 4,012, 4/12/42, p. 447.) |
| 268 | 7361 | Germany | ... *Technical Developments in the Lead Bath Process for the Manufacture of Steel Wire.* (J. Rath, Stahl und Eisen, Vol. 62, No. 47, 19/11/42, pp. 977-983.) |
| 269 | 7364 | Germany | ... *Equilibrium Equations for* $Fe. + H_2S$ *Reactions.* (Stahl und Eisen, Vol. 62, No. 47, 19/11/42, pp. 990-991.) |
| 270 | 7423 | G.B. ... | ... *Influence of Tin in Alloy Steels (from British Iron and Steel Institute).* (G. R. Bolsover and S. Barraclough, Metal Progress, Vol. 42, No. 2, Aug., 1942, pp. 214-215.) |
| 271 | 7439 | G.B. ... | ... *Cast Iron Research.* (Engineering, Vol. 174, No. 4,537, 25/12/42, pp. 527-528.) |

*Tool Steels and Diamond Dies.*

| | | | |
|---|---|---|---|
| 273 | 6029 | G.B. ... | ... *Production of Diamond Tools and Dies.* (Machinery (Ed. B.), Vol. 61, No. 1,564, 1/10/42, pp. 379-383.) |
| 274 | 6004 | G.B. ... | ... *Tipped High Speed Steel Tools.* (L. J. St. Clair, Engineer, Vol. 174, No. 4,532, 20/11/42, pp. 417-419.) |
| 275 | 7051 | U.S.A. | ... *Hard Steel Drill for Case-hardened Steels.* (F. S. Gepfert, Aviation, Vol. 41, No. 8, Aug., 1942, p. 130.) |
| 276 | 7068 | U.S.A. | ... *Heat Treatment of Tool Steels.* (R. C. Stewart, Metal Progress, Vol. 42, No. 3, Sept., 1942.) |
| 277 | 7143 | Germany | ... *The Shaping of Building Stones with Hard Metal Tools.* (H. Eberhardt, Z.V.D.I., Vol. 86, No. 43-44, 31/10/42, pp. 653-654.) |
| 278 | 7150 | U.S.S.R. | ... *Influence of Molybdenum and Vanadium of High Speed Tool Steels Containing* 4 *per cent. Cr. but Poor in Tungsten (from the Russian).* (Stahl und Eisen, Vol. 62, No. 44, 29/10/42, pp. 922-923.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| | | | *Solders* |
| 279 | 6079 | U.S.A. ... | *Bonding Fins on Copper Tubes.* (Metal Industry, Vol. 61, No. 20, 13/11/42.) |
| 280 | 6082 | U.S.A. ... | *Structural Changes in the Bonding Layer of Soft Soldered Joints in Copper Pipe Lines on Long Continued Heating.* (W. H. Swanger and A. R. Maupin, J. Res. Bureau of Stands., Vol. 28, No. 4, April, 1942, pp. 479-487.) |
| 281 | 7024 | G.B. ... ... | *Metal to Glass Fusion (Kovar Alloy).* (Mechanical World, Vol. 112, No. 2,916, 20/11/42, p. 482.) |
| 282 | 7247 | G.B. ... ... | *Silver Solders containing Additions of Lithium.* (Engineering, Vol. 154, No. 4,012, 4/12/42, p. 460.) |
| 283 | 7471 | U.S.A. ... | *Use of Bismuth in Fusible Alloys.* (Bureau of Standards (Circular No. 388), December, 1930.) |
| 284 | 7472 | U.S.A. ... | *Properties of Lead-Bismuth, Lead-Tin, Type Metal and Fusible Alloys.* (J. G. Thompson, Bureau of Standards (Research Paper No. 248), Nov., 1930.) |
| 285 | 7475 | U.S.A. ... | *Lead-Silver Solders Improved by the Addition of Irdium.* (Autom. Ind., Vol. 87, No. 7, Oct. 1st, 1942, p. 214.) |
| | | | *Al. Alloys.* |
| 286 | 5988 | G.B. ... ... | *Effect of Minor Alloying Elements on Al. Casting Alloys.* (W. Bousack, Metal Industry, Vol. 61, No. 21, 20/11/41, pp. 327-330.) |
| 287 | 6052 | Germany ... | *Problems of the Japanese Aluminium and Magnesium Industries (Possible Annual Output 100,000 tons Al. and 10,000 tons Magnesium).* (Die Chemische Industit, Vol. 65, No. 31-32, 7/8/42, pp. 322-324.) |
| 288 | 6069 | G.B. ... ... | *The Fatigue Strength of Heavily Chromium Plated Dural. (R.T.P. Translation No.* 1,383.) (A. Beerwald, Sheet Metal Industry, Vol. 16, No. 188, Dec., 1942, pp. 1,889-1,896.) |
| 289 | 6075 | U.S.A. ... | *Alumina from Low Grade Bauxite, Alunite and Clay (Report by the American War Production Board).* (Metal Industry, Vol. 61, No. 20, 13/11/42, pp. 308-309.) |
| 290 | 6092 | G.B. ... ... | *Effect of Minor Alloying Elements in Al. Casting Alloys.* (W. Bousack, Metal Industry, Vol. 61, No. 22, 27/11/42, pp. 344-345.) |
| 291 | 7027 | G.B. ... ... | *Effect of Minor Alloying Elements as Al. Casting Alloys (Discussion and Extensive Bibliography).* (W. Bousack, A.S.T.M. Bulletin, No. 117, Aug., 1942, pp. 45-59.) |
| 292 | 7111 | Germany ... | *German Standard Specification for Al. Alloys.* (Aluminium, Vol. 24, No. 9, Sept., 1942, pp. 287-292.) |
| 293 | 7117 | Germany ... | *Heat Treatment of Light Alloys—Comparison of Hot Air Furnace and Salt Bath.* (O. Ruder, J. Philippi, Aluminium, Vol. 24, No. 9, Sept., 1942, pp. 315-321.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 294 | 7235 | G.B. ... | ... *Effect of Minor Alloying Elements on Al. Casting Alloys.* (W. Bousack, Metal Industry, Vol. 61, No. 23, 4/12/42, pp. 358-360.) |
| 295 | 7251 | Germany | ... *New German Zinc Alloys.* (Metal Industry, Vol. 61, No. 25, 18/12/42, p. 397.) |
| 296 | 7346 | Germany | ... *Experience with Large Pressure Containers Made in Aluminium.* (W. Mialki, Aluminium, Vol. 24, No. 11, Nov., 1942, pp. 381-384.) |
| 297 | 7347 | Germany | ... *Strength Characteristics of an Al--Mg.-Zn. Alloy After Age Hardening at Room Temperature.* (H. G. Petri, Aluminium, Vol. 24, No. 11, Nov., 1942, pp. 381-384.) |
| 298 | 7352 | G.B. ... | ... *Forging of Al. Alloys.* (Metal Industry, Vol. 61, No. 24, 11/12/42, pp. 372-374.) |
| 299 | 7415 | U.S.A. | ... *Alumina from Low Grade Bauxite, Alunite and Clay.* (Nat. Acad. Sciences, Metal Progress, Vol. 42, No. 2, Aug., 1942, pp. 197-200.) |
| | | | *Plastics.* |
| 300 | 5960 | U.S.A. | ... *Pipes Made of Thermo-Plastic "Saran."* (Sci. Am., Vol. 167, No. 5, Nov., 1942, pp. 207-208.) |
| 301 | 5961 | U.S.A. | ... *Cellophane Lining to Cardboard Containers.* (Sci. Am., Vol. 167, No. 5, Nov., 1942, pp. 220-221.) |
| 302 | 5966 | G.B. ... | ... *Bonding of Plastic to Metal Sheet (Anchoring by Means of Burred Holes in the Latter), Plastel.* (N. A. de Bruyne, British Plastics, Vol. 14, No. 162, Nov., 1942, pp. 306-316 and 349.) |
| 303 | 5968 | G.B. ... | ... *Some Uses of Laminated Phenolic Material.* (British Plastics, Vol. 14, No. 162, Nov., 1942, pp. 325-326.) |
| 304 | 5970 | G.B. ... | ... *Water Absorption of Moulded High Impact Resisting Material.* (M. A. Ayan and F. Luce, British Plastics, Vol. 14, No. 162, Nov., 1942, p. 332.) |
| 305 | 5971 | G.B. ... | ... *Sawdust as a Plastic Filler.* (British Plastics, Vol. 14, No. 162, Nov., 1942, p. 360.) |
| 306 | 5972 | G.B. ... | ... *Weather Resisting Acetate Sheeting for Aircraft Windows (Du Pont de Nemours).* (British Plastics, Vol. 14, No. 162, Nov., 1942, p. 334.) |
| 307 | 5976 | G.B. ... | ... *Effect of Cure on the Properties of Urea Formaldehyde Mouldings.* (J. Hofton, British Plastics, Vol. 14, No. 162, Nov., 1942, pp. 350-352.) |
| 308 | 6001 | G.B. ... | ... *Plastics and the Engineer.* (R. Hammond, Engineer, Vol. 174, No. 4,532, 20/11/42, pp. 412-414.) |
| 309 | 6009 | U.S.A. | ... *Plastic for Waterproofing Materials—Saflex Vinylacetal Resin).* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 17, 10/9/42, pp. 1,113 and 1,116-1,117.) |
| 310 | 6015 | U.S.A. | ... *Cotton Seed Meal as a Filler for Phenolic Resins.* (F. Rosenthal, Ind. and Eng. Chem. (Indus. Ed.), Vol. 34, No. 10, Oct., 1942, pp. 1,154-1,157.) |
| 311 | 6094 | G.B. ... | ... *Classification of Plastics.* (W. L. Morse, Aeronautics, Vol. 7, No. 5, Dec., 1942, pp. 32-37.) |
| 312 | 7092 | G.B. ... | ... *Thermoplastic Resin "Formvar" as a Veneer Bond for Hydulignum Airscrews.* (Plastics, Vol. 6, No. 67, Dec., 1942, pp. 425-427.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 313 | 7093 | G.B. ... ... | *Pliable Plastic Tubing (Polyvinylidene Chloride).* (H. W. Perry, Plastics, Vol. 6, No. 67, Dec., 1942, pp. 429-430.) |
| 314 | 7094 | G.B. ... ... | *Polyvinyl Acetate Adhesives.* (E. E. Halls, Plastics, Vol. 67, No. 67, Dec., 1942, pp. 431-435.) |
| 315 | 7095 | Germany ... | *Mechanical Properties of Plastics at Low Temperature* (from the German). (Plastics, Vol. 6, No. 67, Dec., 1942, pp. 439-442.) |
| 316 | 7096 | Germany ... | *Standardisation of Plastics in Germany.* (Plastics, Vol. 6, No. 67, Dec., 1942, pp. 442-443.) |
| 317 | 7097 | G.B. ... ... | *Resinoids and Other Plastics as a Film Former (Electronic Theory).* (B. J. Brajnikoff, Plastics, Vol. 6, No. 67, Dec., 1942, pp. 459-468.) |
| 318 | 7144 | Germany .... | *Non-Isotropic Expansion of Laminated Plastics.* (Z.V.D.I., Vol. 86, No. 43-44, 31/10/42, p. 654.) |
| 319 | 7183 | G.B. ... ... | *Effect of Conditioning (Temperature and Moisture) Upon Some Physical Properties of Urea Formaldehyde Mouldings.* (J. Hoften, British Plastics, Vol. 14, No. 163, Dec., 1942, pp. 377-380.) |
| 320 | 7185 | G.B. ... ... | *A New Wood Material (Hydulignum).* (British Plastics, Vol. 14, No. 163, Dec., 1942, pp. 381-384.) |
| 321 | 7187 | U.S.A. ... | *Heating Plastic Bonded Plywood by High Frequency Electric Currents.* (British Plastics, Vol. 14, No. 163, Dec., 1941, p. 392.) |
| 322 | 7188 | U.S.A. ... | *'Louverglas" Acetate Plastic (Antiglare for Fluorescent Lamps).* (British Plastics, Vol. 14, No. 163, Dec., 1942, pp. 394 and 402.) |
| 323 | 7189 | G.B. ... ... | *Limited Use of Plastics in Warfare.* (British Plastics, Vol. 14, No. 163, Dec., 1942, p. 423.) |
| 324 | 7191 | G.B. ... ... | *"Saran" Plastic for Seat Coverings (Vinylidene Chloride).* (British Plastics, Vol. 14, No. 163, Dec., 1942, p. 424.) |
| 325 | 7193 | G.B. ... ... | *The Future of Plastics.* (C. Chapman, Chem. and Ind., Vol. 61, No. 50, 12/12/42, pp. 509-511.) |
| 326 | 7206 | U.S.A. ... | *Ethyl Cellulose Plastic Tubing (Flexes at −70°F.).* (Army Ordnance, Vol. 22, No. 135, Nov.-Dec., 1942, p. 430.) |
| 327 | 7215 | G.B. ... ... | *Plastics Abstracts Prepared by Controller of Chemical Research.* (No. 39, November, 1942.) |
| 328 | 7320 | G.B. ... ... | *New Artificial Textiles (Protein Fibres).* (D. B. Halpern, Times and Trade Engineering, Vol. 52, No. 945, Nov., 1942, p. 12.) |
| 329 | 7354 | U.S.A. ... | *Saran Plastic Pipe.* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 20, 25/10/42, p. 1,333.) |
| 330 | 7371 | U.S.A. ... | *Transparent Plastic Pipe for Cooling Systems (Terrik).* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 20, 25/10/42, p. 1,317.) |
| 331 | 7456 | U.S.A. ... | *Loss of Plasticizers from Polyvinyl Chloride Plastics in Vacuum.* (H. A. Liebhapky, Ind. and Eng. Chem (Ind. Ed.), Vol. 34, No. 6, June, 1942, pp. 704-708.) |
| 332 | 7458 | U.S.A. ... | *Protein Aldehyde Plastics.* (D. C. Carpenter and P. E. Lovelace, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 6, June, 1942, pp. 759-763.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 333 | 7459 | U.S.A. ... | *Effect of Solvent on Solid Organic Plastics.* (J. Delmonte, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 6, June, 1942, pp. 764-771.) |
| | | | *Rubber.* |
| 334 | 6008 | U.S.A. ... | *Rubberlike Soybean Material.* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 17, 10/9/42, p. 1,112.) |
| 335 | 6014 | U.S.A. ... | *Technical Microscopy in the Rubber Industry.* (R. P. Allen, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 9, 15/9/42, pp. 740-750.) |
| 336 | 6017 | U.S.A. ... | *Low Temperature Flexibility Behaviour of Vinyl Elastometer (Synthetic Rubber).* (R. F. Clash and R. M. Berg, Ind. and Eng. Chem., Vol. 34, No. 10, Oct., 1942, pp. 1,218-1,222.) |
| 337 | 6081 | U.S.A. ... | *Frictional Properties of Rubber.* (F. L. Roth and others, J. Res. Bureau of Stands., Vol. 28, No. 4, April, 1942, pp. 439-462.) |
| 338 | 7028 | G.B. ... ... | *S.A.E.-A.S.T.M. Classifications Recommended for Natural and Synthetic Rubbers.* (A.S.T.M. Bulletin No. 117, Aug., 1942, pp. 66-69.) |
| 339 | 7032 | G.B. ... ... | *Rubber Mouldings with a Felt Core.* (Airc. Prod., Vol. 4, No. 49, Nov., 1942, p. 638.) |
| 340 | 7186 | U.S.A. ... | *Soft Rubber-like Plastic from Cellulose Derivatives.* (D. R. Wiggan, British Plastics, Vol. 14, No. 163, Dec., 1942, pp. 420-422.) |
| 341 | 7190 | U.S.A. ... | *Synthetic Rubber.* (A. Tomlin, British Plastics, Vol. 14, No. 163, Dec., 1942, pp. 398-402.) |
| 342 | 7312 | U.S.A. ... | *Natural Rubber from the Gauyule Shrub (California).* (Engineer, Vol. 174, No. 4,536, 18/12/42, pp. 505-506.) |
| 343 | 7370 | Germany ... | *Natural Rubber in Eastern Europe.* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 20, 25/10/42, p. 1,312.) |
| 344 | 7382 | U.S.A. ... | *The Houdry System of Producing Butadiene (Deleted by Censor).* (C. H. Thayer, Autom. Ind., Vol. 87, No. 8, 15/10/42, pp. 30-32.) |
| 345 | 7476 | U.S.A. ... | *The Rubber Position in the U.S.A.* (Autom. Ind., Vol. 87, No. 7, Oct. 1st, 1942, pp. 168-171 and 244-262.) |
| | | | *Wood and Cork.* |
| 346 | 5959 | U.S.A. ... | *Determination of Moisture Content of Wood by the Electrical Resistance Method.* (Sci. Am., Vol. 167, No. 5, Nov., 1942, pp. 207-208.) |
| 347 | 5969 | G.B. ... ... | *Weatherproofing Plywood by Plastic Coating.* (British Plastics, Vol. 14, No. 162, Nov., 1942, pp. 359-360.) |
| 348 | 5974 | U.S.A. ... | *Urea Treatment of Lumber (Prevents Cracking and Eases Bending).* (British Plastics, Vol. 14, No. 162, Nov., 1942, pp. 356-357.) |
| 349 | 5997 | G.B. ... ... | *Fireproofing of Timber.* (Engineering, Vol. 154, No. 4,010, 20/11/42, p. 415.) |
| 350 | 6057 | Germany ... | *Buckling Diagram for Spruce Spars (Design Chart 3-4).* (S. Blumrich, Flugsport, Vol. 34, No. 24, 25/11/42, p. 3,669.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 351 | 7031 | G.B. ... | ... *Pneumatic Damping for Plywood Skins.* (Airc. Prod., Vol. 4, No. 49, November, 1942, pp. 635-636.) |
| 352 | 7243 | G.B. ... | ... *Utilisation of Wood Refuse.* (Engineering, Vol. 154, No. 4,012, 4/12/42, p. 446.) |
| 353 | 7356 | G.B. ... | ... *Elastic Constants of Plywood.* (R. F. S. Hearmon, Airc. Eng., Vol. 14, No. 166, Dec., 1942, pp. 336-337 and 340.) |
| 354 | 7445 | G.B. ... | ... *Working Stresses for Indian Timbers.* (Nature, Vol. 150, No. 3,811, 14/11/42, p. 571.) |
| 355 | 7452 | U.S.A. | ... *Composition Cork for Liquid and Moisture Tight Gaskets.* (L. P. Hart and others, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 6, June, 1942, pp. 649-658.) |
| 356 | 7473 | U.S.A. | ... *Plywood in Aircraft Construction.* (O. W. Timm, Autom. Ind., Vol. 87, No. 7, Oct. 1st, 1942, pp. 104-110.) |
| | | | *Bearing Alloys.* |
| 357 | 6077 | G.B. ... | ... *Tin Base Bearing Metals.* (Metal Industry, Vol. 61, No. 20, 13/11/42, p. 309.) |
| 358 | 6091 | G.B. ... | ... *Bonding of Lead Base Alloys to Steel Shells.* (Metal Industry, Vol. 61, No. 22, 27/11/42, p. 341.) |
| 359 | 7072 | U.S.A. | ... *Adhesion of Tin Base Bearing Metals.* (W. T. Pell-Walpole and others, Vol. 42, No. 3, Sept., 1942, pp. 438-442.) |
| 360 | 7119 | G.B. ... | ... *Corrosion Resistant Alloys for Bearing Parts.* (H. Habart, Bearing Engineer, Vol. 2, No. 2, April, 1942, p. 3.) |
| 361 | 7170 | U.S.A. | ... *White Metal Bearing Alloys—Mechanical Properties at Different Temperatures and Service Tests.* (H. K. Herschmann and J. L. Basil, Bureau of Standards Journal of Research, Vol. 10, 1933, pp. 1-5.) |
| 362 | 7180 | U.S.A. | ... *Tin Free Leaded Bearing Bronzes.* (H. K. Herschmann and J. L. Basil, Bureau of Standards Journal of Research, Vol. 10, 1933, pp. 591-608.) |
| 363 | 7249 | G.B. ... | ... *Silver for Bearings.* (A. Bregman, Metal Industry, Vol. 61, No. 25, 18/12/42, pp. 389-392.) |
| 364 | 7351 | G.B. ... | ... *Hardness of Tin-Base Alloys.* (Metal Industry, Vol. 61, No. 24, 11/12/42, p. 371.) |
| 365 | 7422 | U.S.A. | ... *Fixing Bearing Metal in Steel Shells.* (Metal Progress, Vol. 42, No. 2, Aug., 1942, pp. 213-214.) |
| | | | *Magnetic Materials.* |
| 366 | 7223 | U.S.A. | .. *New Magnetic Materials.* (W. E. Ruder, Procs. I.R.E., Vol. 30, No. 10, Oct., 1942, pp. 437-440.) |
| 367 | 7362 | Germany | ... *Compressed Powder Magnets with Synthetic Resin Binder.* (H. Dehler, Stahl und Eisen, Vol. 62, No. 47, 19/11/42, pp. 983-986.) |
| | | | *Materials Testing and Surface Investigation.* |
| 368 | 5973 | U.S.A. | ... *X-Ray Measurement of the Thickness of the Cold-Worked Surface Layer Resulting from Metallographic Polishing.* (*R.P.* 1,494.) (H. C. Vacher, J. Res. Bur. of Stands., Vol. 29, No. 2, Aug., 1942, pp. 177-181.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 369 | 6044 | Germany ... | *Measurement of Degree of Roughness of High Quality Surfaces.* (W. Lueg, Der Betrieb, Vol. 28, No. 8, Aug., 1942, p. 340.) |
| 370 | 6067 | G.B. ... ... | *Methods of Measuring the Thickness and Porosity of Metallic Castings.* (A. Brenner, Sheet Metal Industry, Vol. 16, No. 188, Dec., 1942, pp. 1,861-1,865.) |
| 371 | 7029 | G.B. ... ... | *Verification and Classification of Strain Gauges.* (A.S.T.M. Bulletin, No. 117, Aug., 1942, pp. 83-85.) |
| 372 | 7048 | U.S.A. ... | *Residual Method of Magnaflux Testing (Indicating Medium Applied After Magnetism).* (M. L. Mages, Aviation, Vol. 41, No. 8, Aug., 1942, pp. 118-120 and 155.) |
| 373 | 7057 | Germany ... | *25 Years of German Engineering Specifications.* (W. Hellmich, Stahl und Eisen, Vol. 62, No. 45, 5/11/42, pp. 937-941.) |
| 374 | 7107 | G.B. ... ... | *Mechanical Testing of Light Alloys.* (Airc. Prod., Vol. 4, No. 50, Dec., 1942, pp. 720-723.) |
| 375 | 7114 | Germany ... | *Service Investigation of Al. and Hydronalium by Means of the Electron Microscope (15 Photographs Showing Difference Between Rolled, Recrystallised and Cast State).* (E. Semmler, Aluminium, Vol. 24, No. 9, Sept., 1942, pp. 302-307.) |
| 376 | 7228 | G.B. ... ... | *The Resin Method of Indicating Yield.* (J. S. Blair, Engineer, Vol. 174, No. 4,534, 4/12/42, pp. 455-456.) |
| 377 | 7310 | U.S.A. ... | *Trends in the Technique of Industrial Radiography.* (H. E. Seeman, Engineer, Vol. 174, No. 4,536, 18/12/42, pp. 492-495.) |
| 378 | 7363 | Germany ... | *Elimination of Errors in Impact Strength Determination.* (W. Marx, Stahl und Eisen, Vol. 62, No. 47, 19/11/42, pp. 989-990.) |
| 380 | 7416 | U.S.A. ... | *Shepherd Grain Size Fracture Standards (Stereoscopic Photographs).* (G. K. Manning, Metal Progress, Vol. 42, No. 2, Aug., 1942, p. 2,269.) |
| 381 | 7419 | U.S.A. ... | *Method of Sampling for Metallurgical Test Pieces.* (C. T. Eakin, Metal Progress, Vol. 42, No. 2, Aug., 1942, pp. 207-208.) |
| 382 | 7429 | G.B. ... ... | *Standard Reference Blocks for Surface Finish.* (Engineering, Vol. 155, No. 4,016, 1/1/43, pp. 19-20.) |
| 383 | 7437 | G.B. ... ... | *"Pulsator" Fatigue Testing Machine.* (Engineering, Vol. 174, No. 4,537, 25/12/42, pp. 517-518.) |
| 384 | 7449 | Germany ... | *Fatigue Strength, Extension and X-Ray Internal Stress Investigations on Machined Crankshafts After Straightening.* (R. Schmidt, Luftwissen, Vol. 9, No. 9, Sept., 1942, pp. 263-267.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| | | | *Rapid Identification and Analysis.* |
| 385 | 6007 | U.S.A. ... | *Purity of Mercury Estimated from Surface Tension.* (E. Wichers, Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 17, 10/9/42, p. 1,110.) |
| 386 | 6010 | U.S.A. ... | *Chemical Analysis of Tin Base Bearing Metals.* (J. R. Andrews and A. J. Bender, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 9, 15/9/42, pp. 713-714.) |
| 387 | 6011 | U.S.A. ... | *Determination of Al. in Manganese and Al. Bronzes (Mercury Cathode Cell Method).* (A. C. Hollard and J. P. Yeager, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 9, 15/9/42, pp. 719-720.) |
| 388 | 7015 | ... ... | *Simple Hardness Gauge for Al. Alloys.* (Rev. of Scientific Insts., Vol. 19, No. 10, Oct., 1942, p. 159.) |
| 389 | 7060 | Germany ... | *Determination of Zn. in Al. Alloy (Chemical).* (R. Bauer and J. Eisen, Stahl und Eisen, Vol. 62, No. 45, 5/11/42, p. 949.) |
| 390 | 7061 | Germany ... | *Determination of Zn. in Al. Alloys (Electrolytic).* (K. Steinhauser, Stahl und Eisen, Vol. 62, No. 45, 5/11/42, p. 949.) |
| 391 | 7062 | Germany ... | *Determination of Sn. in Al. Alloys (Chemical).* (K. Steinhauser, Stahl und Eisen, Vol. 62, No. 45, 5/11/42, pp. 949-950.) |
| 392 | 7063 | Germany ... | *Determination of Fe. in Mg. (Rapid "Colorimetric" Method).* (W. Leitgebel and G. Muss, Stahl und Eisen, Vol. 62, No. 45, 5/11/42, pp. 950.) |
| 393 | 7064 | Germany ... | *Rapid Determination of Mg. in Al.-Mg. Alloy by X-Ray Diffraction.* (H. Kustner, Stahl und Eisen, Vol. 62, No. 45, 5/11/42, p. 950.) |
| 394 | 7175 | U.S.A. ... | *Magnetic Balance for the Inspection of Austenitic Steel.* (R. L. Sanford, Bureau of Standards Journal of Research, Vol. 10, 1933, pp. 619-637.) |
| 395 | 7194 | G.B. ... ... | *Analytical Uses of Absorptionmeter, Polarograph and Spectrograph (Critical Review).* (H. K. Whalley, Chem. and Ind., Vol. 61, No. 49, 5/12/42, pp. 495-497.) |
| 396 | 7199 | G.B. ... ... | *Rapid Identification of Ni. Steels (Nitric Acid Reaction, Dymethylglyoxime Indicator).* (Autom. Eng., Vol. 32, No. 431, Dec., 1942, p. 30.) |
| 397 | 7315 | U.S.A. ... | *Gravimetric Determination of Al. in Mg. Alloys (Benzoate-Oxine Method).* (V. A. Stenger and others, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 10, 16/10/42, pp. 797-798.) |
| 398 | 7316 | U.S.A. ... | *Determination of C in Low Carbon Iron and Steel (Low Pressure Combustion).* (L. A. Wooten and W. G. Guldner, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 10, 16/10/42, pp. 835-838.) |
| 399 | 7349 | Germany ... | *Practical Experience with a Fully Automatic Tuning Device for Spectrographic Analysis (Zeiss).* (H. Moritz, Aluminium, Vol. 24, No. 11, Nov., 1942, pp. 394-396.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| | | | *Degreasing.* |
| 400 | 6072 | U.S.A. ... | *Quantitative Evaluation of Metal-Cleaning Compounds.* (O. M. Morgan and J. B. Lankler, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 9, 15/9/42, pp. 725-726.) |
| 401 | 6016 | U.S.A. ... | *Evaluation of a Surface Active Agent (Alkyl Arye Sodium Sulphonetic) for Metal Cleaning.* (O. M. Morgan and T. G. Lankler, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 10, Oct., 1942, pp. 1,158-1,157.) |
| 402 | 6038 | G.B. ... ... | *Metal Degreasing.* (Airc. Eng., Vol. 14, No. 165, Nov., 1942, pp. 329-330.) |
| 403 | 7236 | G.B. ... ... | *Surface Active Agent for Metal Cleaning (Sodium Sulphonate Base).* (O. M. Morgan and J. G. Lankle, Metal Industry, Vol. 61, No. 22, 4/12/42, p. 361.) |
| | | | *Corrosion.* |
| 404 | 5965 | U.S.A. ... | *Water Immersion Testing of Metal Protective Paints.* (W. W. Kittelberger, Vol. 34, No. 8, Aug., 1942, pp. 943-948.) |
| 405 | 5987 | G.B. ... ... | *Corrosion of Mg. and Mg.-Base Alloys.* (C. J. Bushrod, Metal Industry, Vol. 61, No. 21, 20/11/42, pp. 324-325.) |
| 406 | 5994 | U.S.A. ... | *Soil Corrosion Studies* 1939—*Ferrous and Non-Ferrous Corrosion Resistant Materials.* (K. H. Logan, J. Res. Bur. Stands., Vol. 28, No. 3, March, 1942, pp. 379-400.) |
| 407 | 6000 | G.B. ... ... | *Corrosion of Boiler Tubes.* (T. H. Turner, Engineer, Vol. 174, No. 4,533, 27/11/42, pp. 446-448.) |
| 408 | 6068 | G.B. ... ... | *Influence of Delayed Quenching During Solution Heat Treatment on the Resistance of Dural to Intercrystalline Corrosion.* (J. C. Arrowsmith and G. Murray, Vol. 16, No. 188, Dec., 1942, pp. 1,879-1,884 and 1,910.) |
| 409 | 7056 | G.B. ... ... | *Boiler Scale Prevention.* (Electrician, Vol. 129, No. 3,353, 13/11/42, pp. 525-527.) |
| 410 | 7075 | U.S.A. ... | *Rate of Oxidation of Typical Non-Ferrous Metals as Determined by Interference Colours of Oxide Films.* (D. J. McArthur and C. W. Jeil, J. Res. Bureau of Stands., Vol. 28, No. 5, May, 1942.) |
| 411 | 7122 | G.B. ... ... | *Corrosion Prevention by Re-Lubrication of Needle Bearing.* (H. W. Hayes, Bearing Engineer, Vol. 2, No. 4, Aug., 1942, p. 3.) |
| 412 | 7230 | G.B. ... ... | *Corrosion of Boiler Tubes.* (T. H. Turner, Engineer, Vol. 174, No. 4,534, 4/12/42, pp. 466-468.) |
| 413 | 7245 | G.B. ... ... | *Caustic Embrittlement.* (E. W. Colbeck and others, Engineering, Vol. 154, No. 4,012, 4/12/42, p. 455.) |
| 414 | 7246 | G.B. ... ... | *Corrosion of Boiler Tubes.* (T. H. Turner, Engineering, Vol. 154, No. 4,012, 4/12/42, pp. 455-456.) |
| 415 | 7304 | G.B. ... ... | *Corrosion in Boiler Tubes.* (T. H. Turner, Engineering, Vol. 154, No. 4,013, 11/12/42, pp. 464-465.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 416 | 7309 | G.B. ... ... | *Caustic Embrittlement.* (E. W. Colbeck and others, Engineering, Vol. 154, No. 4,013, 11/12/42, pp. 478-480.) |
| 417 | 7434 | G.B. ... ... | *Corrosion of Boiler Tubes.* (T. H. Turner, Engineering, Vol. 154, No. 4,015, 25/12/42, pp. 503-505.) |
| 418 | 7436 | G.B. ... ... | *Caustic Embrittlement.* (E. W. Colbeck and others, Engineering, Vol. 154, No. 4,015, 25/12/42, pp. 517-529.) |
| 419 | 7457 | U.S.A. ... | *Corrosion of Steel by Dissolved Carbon Dioxide and Oxygen.* (G. T. Skaperdas and H. H. Uhlig, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 6, June, 1942, pp. 748-754.) |
| | | | *Surface Treatment.* |
| 420 | 5963 | U.S.A. ... | *P.H. Control of Chromic Acid Anodic Baths.* (W. H. Hartford, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 8, Aug, 1942, pp. 920-924.) |
| 421 | 5992 | Germany ... | *Anti-Corrosion Surface Treatment by Volatile Cr. Compounds (Irkrom Process).* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 19, 10/10/42, p. 1,247.) |
| 422 | 6070 | G.B. ... ... | *Causes of Fish Scaling of Enamels.* (W. W. Higgins, Sheet Metal Industry, Vol. 16, No. 188, Dec., 1942, pp. 1,894-1,896.) |
| 423 | 6093 | G.B. ... ... | *M.A.P. Specification on Protective Metallic Coatings (Discussion).* (Metal Industry, Vol. 61, No. 22, 27/11/42, pp. 346-348.) |
| 424 | 7073 | U.S.A. ... | *Elimination of Oxide Films on Ferrous Materials by Heating in Vacuum.* (V. C. F. Holm, J. Res. Bureau of Stands., Vol. 28, No. 5, May, 1942, pp. 569-579.) |
| 425 | 7152 | Germany ... | *Sea Water Tests on Rust Resisting Paints and Varnishes.* (W. Kronsbein, W.R.H., Vol. 23, No. 17, 1/9/42, pp. 233-242.) |
| 426 | 7169 | Germany ... | *Metal Spraying of Fabrics.* (M. W. Schsop and C. H. Daeschle, Handbook of Metal Spraying Technique, 1935, pp. 148-151.) |
| 427 | 7354 | G.B. ... ... | *Mechanism of Bright Electroplating, I (Nickel Deposition).* (J. A. Henrick, Metal Industry, Vol. 61, No. 24, 11/12/42, pp. 378-380.) |
| 428 | 7420 | U.S.A. ... | *Simplified Electro Polishing of Steel Specimens.* (R. W. Parcel, Metal Progress, Vol. 42, No. 2, Aug., 1942, pp. 209-212.) |
| | | | *Casting.* |
| 429 | 6076 | G.B. ... ... | *Designing Die Castings.* (Metal Ind., Vol. 61, No. 20, 13/11/42, p. 309.) |
| 430 | 6089 | G.B. ... ... | *Producing Non-Ferrous Castings Centrifugally.* (H. B. Zuelke, Metal Industry, Vol. 61, No. 22, 27/11/42, pp. 338-341.) |
| 431 | 7112 | Germany ... | *On Mysterious Periods of Rejects in the Al. Foundry.* (P. Schwerber, Aluminium, Vol. 24, No. 9, Sept., 1942, pp. 293-297.) |
| 432 | 7302 | G.B. ... ... | *Steel Foundry Moulding Materials.* (Engineering, Vol. 154, No. 4,014, 18/12/42, pp. 487-488.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 433 | 7435 | G.B. ... | *Steel Foundry Moulding Materials.* (Engineering, Vol. 154, No. 4,015, 25/12/42, p. 514.) |
| | | | *Rolling.* |
| 434 | 6088 | U.S.A. | *Effect of Moderate Cold Rolling on the Hardness of the Surface Layer of .34 per cent. C. Steel Plates.* (H. K. Herschmann, J. Res. Bureau of Stands., Vol. 29, No. 1, July, 1942, pp. 57-67.) |
| 435 | 7148 | Germany | *Influence of Cold Rolling on the Properties of 18 per cent. Cr., 8 per cent. Ni. Steel.* (W. Puyicha, Stahl und Eisen, Vol. 62, No. 44, 29/10/42, pp. 920-921.) |
| 436 | 7348 | Germany | *Some Notes on Rolling Mills for Light Alloys.* (W. Kramer, Aluminium, Vol. 24, No. 11, Nov., 1942, pp. 390-393.) |
| | | | *Drawing and Forming.* |
| 437 | 6037 | U.S.A. | *Elastic Theory in Sheet-Forming Problems (from the U.S.A.).* (F. R. Stanley, Airc. Eng., Vol, 14, No. 165, Nov., 1942, pp. 325-328.) |
| 438 | 6074 | G.B. ... | *Carbide Dies for Tube Drawing.* (E. Glen, Metal Ind., Vol. 61, No. 20, 13/11/42, pp. 306-307.) |
| 439 | 7113 | Germany | *The Effect of Tempering Temperature on the Drawing Qualities of Hard Rolled Pure Al. Sheets* (220° ± 5°*C. Recommended*). (A. J. Stelljes, Aluminium, Vol. 24, No. 9, Sept., 1942, pp. 298-302.) |
| 440 | 7383 | U.S.A. | *Technical Aspects of Sheet Metal Forming, Part 2 (Partly Deleted by Censor).* (F. R. Shawley, Autom. Ind., Vol. 87, No. 8, 15/10/42, pp. 33-37.) |
| 441 | 7424 | U.S.A. | *Wedge Draw v. Tension Test to Determine Drawability of Al. Alloys.* (G. A. Brewer, Metal Progress, Vol. 42, No. 2, Aug., 1942, pp. 216-217.) |
| 442 | 7474 | U.S.A. | *Sheet Metal Forming.* (F. R. Shanley, Autom. Ind., Vol. 87, No. 7, Oct. 1st, 1942, pp. 112-123.) |
| | | | *Welding.* |
| 443 | 5977 | U.S.A. | *The Tee Bend Test to Compare the Welding Quality of Steels (R.P. 1,444).* (G. A. Ellinger and others, J. Res. Bur. of Stands., Vol. 28, No. 1, Jan., 1942, pp. 1-49.) |
| 444 | 5989 | U.S.A. | *Spirally Brazed Steel Tubing (from the U.S.A.).* (Metal Industry, Vol. 61, No. 21, 20/11/42, pp. 331-332.) |
| 445 | 5990 | G.B. ... | *Welding of Al. Castings.* (Metal Industry, Vol. 61, No. 21, 20/11/42, p. 332.) |
| 446 | 6066 | G.B. ... | *Electronic Control of Resistance Welding Machines.* (G. Higgins, Sheet Metal Industry, Vol. 16, No. 188, Dec., 1942, pp. 1,917-1,922.) |
| 447 | 6071 | G.B. ... | *Performance of Modified Resistance Welding Electrodes.* (S. H. Parsonage, Sheet Metal Industry, Vol. 16, No. 188, Dec., 1942, pp. 1,913-1,916.) |
| 448 | 7071 | U.S.A. | *Fusian Welding of Magnesium in an Atmosphere of Helium (Heliarc Process).* (T. E. Piper, Metal Progress, Vol. 42, No. 3, Sept., 1942, pp. 404 and 412.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 449 | 6085 | G.B. ... | ... *Development in Welded Ship Construction.* (J. L. Adam, Engineering, Vol. 154, No. 4,011, 27/11/42, pp. 425-426.) |
| 450 | 7250 | U.S.A. | ... *Inspection of Al. Welds (American Standards).* (Metal Industry, Vol. 61), No. 25, 18/12/42, pp. 395-396.) |
| 451 | 7267 | G.B. ... | ... *Welding of Mg. Alloys (Heliarc and Oxy-Acetylene Methods Compared).* (Flight, Vol. 42, No. 1,773, 17/12/42, p. 670.) |
| 452 | 7305 | G.B. ... | ... *Developments in Welded Ship Construction.* (J. L. Adams, Engineering, Vol. 154, No. 4,013, 11/12/42, pp. 465-466.) |
| 453 | 7321 | G.B. ... | ... *Recent Advances in Arc Welding.* (Times Trade and Engineering, Vol. 52, No. 945, Nov., 1942, p. 30.) |
| 454 | 7365 | Germany | ... *The Annealing of High Duty Electro Welds.* (Stahl und Eisen, Vol. 62, No. 47, 19/11/42, p. 991.) |
| 455 | 7407 | G.B. ... | ... *Preheating for Al. Welding.* (Mech. World, Vol. 112, No. 2,921, 25/12/42, p. 613.) |
| 456 | 7417 | U.S.A. | ... *Fish Eyes in Steel Welds Caused by Hydrogen.* (C. A. Zepffe, Metal Progress, Vol. 42, No. 2, Aug., 1942, pp. 201-206.) |
| 457 | 7421 | U.S.A. | ... *Prevention of Cracks in Welded Low Alloy Steel.* (E. C. Rollason and A. H. Cottrell, Metal Progress, Vol. 42, No. 2, Aug., 1942, pp. 212, 282, 290, 292, 296, 300.) |
| | | | *Flame Hardening.* |
| 458 | 7070 | U.S.A. | ... *Advances in Flat Surface Hardening (Radiant Combustion in Gas Flame).* (F. O. Hess, Metal Progress, Vol. 43, No. 3, Sept., 1942, pp. 399-402.) |
| 459 | 7406 | G.B. ... | ... *Shorter Blade Hardening Machine with Ward-Leonard Speed Control.* (Mech. World, Vol. 112, No. 2,921, 26/12/42, pp. 611 and 613.) |
| | | | *Grinding and Stress Relief.* |
| 460 | 7200 | G.B. ... | ... *Thread Grinding.* (Autom. Eng., Vol. 32, No. 431, Dec., 1942, pp. 533-534.) |
| 461 | 7233 | U.S.A. | ... *Relief of Residual Stress in Streamline Tie Rods.* (R. E. Pollard and F. M. Reinhart, Bur. of Stands. J. Res., Vol. 28, No. 6, June, 1942, pp. 755-772.) |
| | | | *Metal Diffusion.* |
| 462 | 7151 | Germany | ... *Diffusion of C. and P. in Steels.* (Stahl und Eisen, Vol. 62, No. 44, 29/10/42, p. 926.) |
| 463 | 7353 | G.B. ... | ... *Diffusion of Metals Accompanied by a Phase Change.* (Metal Industry, Vol. 61, No. 24, 11/12/42, p. 374.) |
| | | | *Miscellaneous.* |
| 464 | 5962 | U.S.A. | ... *Industrial Utilisation of Selenium and Tellurium.* (G. R. Waitkins and others, Ind. and Eng. Chem. (Ind. Ed.), Vol. 34, No. 8, Aug., 1942, pp. 899-910.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 465 | 7237 | G.B. ... | ... *Beryllium Copper.* (L. B. Hunt, Electronic Engineering, Vol. 14, No. 178, Dec., 1942, pp. 276-279.) |
| 466 | 5991 | U.S.A. | ... "*Fiberglass" in Building Construction.* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 19, 10/10/42, p. 1,236.) |

## Production.

*Planning.*

| | | | |
|---|---|---|---|
| 467 | 7108 | G.B. ... | ... *Control of Production (Planning and Progress System).* (F. A. Carey, Airc. Prod., Vol. 4, No. 50, Dec., 1942, pp. 724-726.) |
| 468 | 7140 | Germany | ... *Increasing Output by Proper Choice of Semi-Finished Product and Utilisation of Special Machine Tools.* (O. Kienzle, Z.V.D.I., Vol. 86, No. 43-44, 31/10/42, pp. 641-648.) |
| 469 | 7425 | G.B. ... | ... *The Costing of Government Contracts.* (Engineering, Vol. 155, No. 4,016, 1/1/43, p. 12.) |
| 470 | 7461 | U.S.A. | ... *U.S. Army-Navy Standardisation.* (D. G. Lingle and G. A. Seitz, S.A.E.J., Vol. 50, No. 11, Nov., 1942, pp. 32-33 and 66-80.) |
| 471 | 7463 | U.S.A. | ... *The War Production Effort in Aircraft.* (T. P. Wright, S.A.E.J., Vol. 50, No. 11, Nov., 1942, pp. 29-31 and 64-66.) |

*Labour.*

| | | | |
|---|---|---|---|
| 472 | 7103 | G.B. ... | ... *Training Female Labour (Westland Aircraft).* (Airc. Prod., Vol. 4, No. 50, Dec., 1942.) |
| 473 | 7358 | G.B. ... | ... *Medical Aspects of Labour Dilution.* (Airc. Eng., Vol. 14, No. 166, Dec., 1942, pp. 359-360.) |

*Methods and Equipment.*

| | | | |
|---|---|---|---|
| 474 | 6020 | U.S.A. | ... *Production Testing Facilities of Allison Division of General Motors.* (H. J. Buttner, S.A.E.J., Vol. 50, No. 10, Oct., 1942, pp. 444-449.) |
| 475 | 6028 | U.S.A. | ... *Manufacturing Methods at the New Douglas Airplane Works.* (Machinery (Ed. B.), Vol. 61, No. 1,564, 1/10/42, pp. 371-375.) |
| 476 | 6056 | Germany | ... *Box for Small Parts with Automatically Closing Lid to Prevent Spilling.* (Blohm and Voss, Flugsport, Vol. 34, No. 24, 25/11/42, pp. 359-360.) |
| 477 | 6091 | G.B. ... | ... *Drop Hammer Forming of Aircraft Parts.* (C. H. Miller and R. B. Stubbs, Metal Industry, Vol. 61, No. 22, 27/11/42, p. 342.) |
| 478 | 7022 | G.B. ... | ... *Portable Electric Tools (Application, Protection and Maintenance).* (Mechanical World, Vol. 112, No. 2,916, 20/11/42, pp. 477-478.) |
| 479 | 7033 | G.B. ... | ... *Template Reproduction by Electrolyte Transfer.* (Airc. Prod., Vol. 4, No. 49, Nov., 1942, p. 650.) |
| 480 | 7034 | G.B. ... | ... *Rotol Electrically Operated Airscrew (Production).* (J. A. Oates, Airc. Prod., Vol. 4, No. 49, Nov., 1942, p. 650.) |
| 481 | 7037 | U.S.A. | ... *Boeing Fortress Production.* (Airc. Production, Vol. 4, No. 49, Nov., 1942, pp. 669-671.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 482 | 7039 | G.B. ... | *Stirling Undercarriage (Production and Testing.* (Airc. Prod., Vol. 4, No. 49, Nov., 1942, pp. 672-679.) |
| 483 | 7044 | U.S.A. | *Castaloy Fixtures for Aircraft Production (Jigs).* (C. S. Ricker, Aviation, Vol. 41, No. 8, Aug., 1942, pp. 106-109.) |
| 484 | 7050 | U.S.A. | *Induction Heating for Aircraft Production.* (J. W. Cable, Aviation, Vol. 41, No. 8, Aug., 1942, pp. 127-128.) |
| 485 | 7082 | Germany | *Jigs for Large Aircraft Parts (Pat. Series 40, No. 725,369).* (Henschel, Flugsport, Vol. 34, No. 22, 28/10/42, p. 161.) |
| 486 | 7106 | G.B. ... | *Production of Walrus Amphibian, Part II.* (F. C. Sheffield, Airc. Prod., Vol. 4, No. 50, Dec., 1942, pp. 710-715.) |
| 487 | 7360 | U.S.S.R. | *YAK-1 (I-26) in Production (Photograph).* (Airc. Eng., Vol. 14, No. 166, Dec., 1942, pp. 363-364.) |
| 488 | 7380 | U.S.A. | *Boeing's Production of Flying Fortresses by the Density System.* (Autom. Ind., Vol. 81, No. 8, 15/10/42, pp. 16-19 and 56.) |
| 489 | 7477 | U.S.A. | *Taking Out Skin Wrinkles by Electric Heaters (Glenn Martin Aircraft).* (Autom. Ind., Vol. 87, No. 7, Oct. 1st, 1942, p. 83.) |
| | | | *Reconditioning.* |
| 490 | 6046 | Germany | *Performance of Mechanically Reconditioned and Chemically Sharpened Files.* (H. Schallbroch and W. Bieling, Werkstatt and Betrieb, Vol. 75, No. 8, Aug., 1942, pp. 175-179.) |
| 491 | 6045 | Germany | *Wear of Cutting Tools as Affected by Shape of Tool.* (H. Ferchland, Der Betrieb, Vol. 28, No. 8, Aug., 1942, pp. 333-336.) |
| 492 | 7036 | G.B. ... | *Servicing of Fluorescent Lamps.* (Airc. Prod., Vol. 4, No. 49, Nov., 1942, pp. 662-664.) |
| 493 | 7402 | Germany | *Hydraulic Appliance for Straightening Buckled Tubing in the Field (Junkers).* (El. Progresso de la Ingenieria, Vol. 20, No. 3, May, 1942, p. 60.) |
| 494 | 7266 | G.B. ... | *Activities of the Propeller and Engine Repair Auxiliary.* (Flight, Vol. 42, No. 1,773, 17/12/42, pp. 668-669.) |
| 495 | 7298 | G.B. ... | *Repair and Salvage of Aero Engines.* (Engineer, Vol. 174, No. 4,535, 11/12/42, pp. 475-477.) |
| | | | *Salvage.* |
| 496 | 6032 | G.B. ... | *Salvage Systems at Ford Dagenham Works.* (Airc. Eng., Vol. 14, No. 165, Nov., 1942, p. 336.) |
| 497 | 7017 | G.B. ... | *Recovering Metal from Scrap.* (H. Hartley, Nature, Vol. 150, No. 3,812, 21/11/42, pp. 594-597.) |
| 498 | 7023 | G.B. ... | *Efficient Disposal of Swarf.* (Mechanical World, Vol. 112, No. 2,916, 20/11/42, pp. 480-481.) |
| 499 | 7149 | Germany | *Compact Steel Swarf by Auto-Combustion (Scrap Disposal).* (Stahl und Eisen, Vol. 62, No. 44, 29/10/42, pp. 921-922.) |
| 500 | 7248 | G.B. ... | *Sampling and Pretreatment of Al. Alloy Scrap.* (E. Feuer, Metal Industry, Vol. 61, No. 25, 18/12/42, pp. 386-388.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| | | | **Heat.** |
| 501 | 5978 | U.S.A. ... | *Coefficient of Expansion of Heat Resisting Silica Glass (Vycor).* (J. B. Saunders, J. Res. Bur. of Stands., Vol. 28, No. 1, Jan., 1942, pp. 51-55.) |
| 502 | 5998 | ... ... | *Boilers—Past and Present.* (S. J. Thompson, Engineering, Vol. 154, No. 4,010, 20/11/42, pp. 418-420.) |
| 503 | 6002 | G.B. ... ... | *Recent Developments in Refrigeration.* (D. Gordon, Engineer, Vol. 174, No. 4,532, 20/11/42.) |
| 504 | 7174 | U.S.A. ... | *The Effect of Altitude on the Limits of Safe Operation of Gas Appliances (Domestic Water Heaters, etc.).* (J. H. Eisman and others, Bureau of Standards Journal of Research, Vol. 10, 1933, pp. 619-637.) |
| 505 | 7218 | G.B. ... ... | *Application of Physics to the Heating and Ventilation of Buildings.* (A. F. Dufton, Nature, Vol. 150, No. 3,815, 12/12/42, pp. 678-680.) |
| 506 | 7225 | U.S.A. ... | *A Non-Fouling $H_2$ Liquefier.* (E. A. Blanchard and H. W. Bittner, Rev. of Scient. Insts., Vol. 13, No. 9, Sept., 1942, pp. 394-405.) |
| 507 | 7242 | G.B. ... ... | *Recent Developments in Refrigeration.* (D. Gordon, Engineering, Vol. 154, No. 4,012, 4/12/42, pp. 444-446.) |
| 508 | 7301 | G.B. ... ... | *Recent Developments in Refrigeration.* (D. Gordon, Vol. 154, No. 4,014, 18/12/42, pp. 484-486.) |
| 509 | 6084 | G.B. ... ... | *Infra-Red Lamp Heating.* (F. E. Rowland, Engineering, Vol. 154, No. 4,011, 27/11/42, pp. 424-425.) |
| | | | **Sound.** |
| 510 | 7284 | G.B. ... ... | *Aircraft Noise.* (D. G. Greenwood, Flight, Vol. 42, No. 1,771, 3/12/42, pp. 615-616.) |
| 511 | 7288 | G.B. ... ... | *Aircraft Noise, II.* (D. G. Greenwood, Flight, Vol. 42, No. 1,772, 10/12/42, pp. 631-632.) |
| 512 | 7444 | G.B. ... ... | *Radiation Pattern of the Human Voice.* (Nature, Vol. 150, No. 3,811, 14/11/42, p. 583.) |
| | | | **Instruments.** |
| | | | *Aircraft.* |
| 513 | 6095 | G.B. ... ... | *Bubble Sextant Acceleration Errors.* (C. Williams, Aeronautics, Vol. 7, No. 5, Dec., 1942, pp. 42-43.) |
| 514 | 7104 | G.B. ... ... | *Rate of Climb Indicators (Manufacture and Testing of K.D.G. Instruments).* (Airc. Prod., Vol. 4, No. 50, Dec., 1942, pp. 695-700.) |
| 515 | 7413 | Germany ... | *A New Type of Carbon Resistance Accelerometer Fitted with Internal Damping (Covering Range 0-500 m./sec.² (Digest).* (H. Niepel, Z. fur Instrum., Vol. 62, No. 10, Oct., 1942, pp. 333-334.) |
| 516 | 7076 | U.S.A. ... | *Improved Instrument for Measuring the Air Permeability of Fabrics.* (H. F. Schiefe and P. M. Boyland, J. Res. Bureau of Stands., Vol. 28, No. 5, May, 1942, pp. 637-642.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| | | | *Testing Textiles.* |
| 517 | 7172 | U.S.A. ... | *The Flexometer (Instrument for Evaluating the Flexural Properties of Cloth).* (H. F. Schiefer, Bureau of Standards Journal of Research, Vol. 10, 1933, pp. 647-657.) |
| 518 | 7178 | U.S.A. ... | *The Compressometer (Comp. Resilience of Textiles).* (H. Schiefer, Bureau of Standards Journal of Research, Vol. 10, 1933, p. 705.) |
| | | | *Temperature Recording.* |
| 519 | 5986 | U.S.A. ... | *Comparison of Platinum Resistance Thermometer Between* $-190°$ *and* $445°C$. *(R.P. 1,454.)* (H. J. Hoge and F. G. Blickwedde, J. Res. Bur. of Stands.) |
| 520 | 7307 | G.B. ... | *Temperature Indicating Crayons.* (Engineering, Vol. 154, No. 4,013, 11/12/42, p. 466.) |
| | | | *Electrical.* |
| 521 | 7011 | G.B. ... | *Floatless Liquid Level Control.* (Electrician, Vol. 129, No. 3,364, 20/11/42, p. 549.) |
| 522 | 7019 | G.B. ... | *Overhaul of Moving Coil Meters.* (Wireless World, Vol. 48, No. 11, Nov., 1942, pp. 250-252.) |
| 523 | 7147 | Germany ... | *Distant Electric Control of Ship's Rudder Position (A.E.G. Adv.).* (Z.V.D.I., Vol. 86, No. 43-44, 31/10/42, p. 654.) |
| 524 | 7179 | U.S.A. ... | *An Apparatus for Magnetic Testing at High Magnetising Force.* (R. L. Sanford and E. C. Bennett, Bureau of Standards Journal of Research, Vol. 10, 1933, p. 567-573.) |
| 525 | 7427 | G.B. ... | *Floatless Electrical Liquid Level Indicator.* (Engineering, Vol. 155, No. 4,016, 1/1/43, p. 17.) |
| | | | *Electronic.* |
| 526 | 7026 | G.B. ... | *A Scanning Electron Microscope.* (V. K. Zworykin and others, A.S.T.M. Bulletin, No. 117, Aug., 1942, pp. 15-23.) |
| 527 | 7125 | G.B. ... | *Electron Lenses.* (D. Gabor, Nature, Vol. 150, No. 3,814, 5/12/42, pp. 650-652.) |
| 528 | 7239 | G.B. ... | *A Simple Electronic Switch.* (A. W. Russell, Electronic Engineering, Vol. 14, No. 178, Dec., 1942, pp. 284-285.) |
| 529 | 7240 | G.B. ... | *Electric Circuit for Testing Magnetic Materials with the Cathode Ray Oscillograph (Hysteresis Loop).* (Electronic Engineering, Vol. 14, No. 178, Dec., 1942, p. 286.) |
| 530 | 7313 | U.S.A. ... | *Electron Optics.* (D. Gabor, Electronic Engineering, Vol. 14, No. 178, Dec., 1942, pp. 295-299.) |
| 531 | 7241 | G.B. ... | *A Rapid X-Ray Diffraction Method (Powder Samples).* (A. T. McCord, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 10, 16/10/42, pp. 793-795.) |
| 532 | 7314 | U.S.A. ... | *Electrical Ignition of the Spectrographic Arc.* (F. G. Brockmann and F. P. Hochgesang, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 10, 16/10/42, p. 796.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 533 | 7318 | U.S.A. ... | *Simple Thyraton Circuit for Thermostat Regulators.* (S. Golden, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 10, 16/10/42, p. 812.) |
| 534 | 7350 | Canada ... | *Electronic Extensometer for Creep Tests.* (Metal Industry, Vol. 61, No. 24, 11/12/42, p. 371.) |
| 535 | 7412 | Germany ... | *Photo Electric Microphotometer with Oscillating Image Mirror (Digest).* (S. Bodforss, Z. fur Instrum., Vol. 62, No. 10, Oct., 1942, pp. 332-333.) |
| 536 | 7414 | Germany ... | *Friction Measurements on Knife Edge Bearings (Digest).* (R. Vieweg and H. Zetsche, Z. fur Instrum., Vol. 62, No. 10, Oct., 1942, pp. 334-336.) |
| 537 | 7418 | U.S.A. ... | *Measuring Very Small Moisture or $O_2$ Content in $H_2$ (Electronic).* (P. R. Kalischer, Metal Progress, Vol. 42, No. 2, Aug., 1942, p. 233.) |

## Wireless.

*Basic Principle.*

| | | | |
|---|---|---|---|
| 538 | 7021 | G.B. ... ... | *Hot Cathode Emission, III.* (M. Johnson, Wireless World, Vol. 48, No. 11, Nov., 1942, pp. 259-261.) |
| 539 | 7110 | G.B. ... ... | *Physical Foundation of Radio, II (Semi-Conductors, Super-Conductivity and Alloys).* (M. Johnson, Wireless World, Vol. 48, No. 10, Oct., 1942, pp. 237-239.) |
| 540 | 7173 | U.S.A. ... | *Cause and Elimination of Night Effects in Radio Range Beacon Reception.* (H. Diamond, Bureau of Standards Journal of Research, Vol. 10, 1933, pp. 7-34.) |
| 541 | 7256 | Switzerland ... | *Frequency Modulation.* (G. Guanella and J. Schwartz, Brown Boveri Review, Vol. 28, No. 12, Dec., 1941, pp. 417-422.) |
| 542 | 7257 | Switzerland ... | *Recent Physical Research on Atom Nuclei.* (P. Scherrer, Brown Boveri Review, Vol. 28, No. 12, Dec., 1941, pp. 436-440.) |
| 543 | 7205 | U.S.A. ... | *The Rheotron in Metallurgical Research (High Energy Electron Discharge as an Alternative to the Positive Ions of the Cyclotron).* (Army Ordnance, Vol. 22, No. 135, Nov.-Dec., 1942, pp. 523.) |
| 544 | 7217 | U.S.A. ... | *Formulas for the Skin Effect.* (H. A. Wheeler, Procs. I.R.E., Vol. 30, No. 9, Sept., 1942, pp. 412-424.) |

*Ultra Short Waves.*

| | | | |
|---|---|---|---|
| 545 | 7020 | G.B. ... ... | *Effect of Terrain Contour and Direction of Polarisation on Range of Ultra Short Waves.* (Wireless World, Vol, 48, No. 11, Nov., 1942, p. 252.) |
| 546 | 7224 | U.S.A. ... | *A New Direct Crystal Controlled Oscillator for Ultra Short Wave Frequencies.* (W. P. Mason, Procs. I.R.E., Vol. 30, No. 10, Oct., 1942, pp. 464-472.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 547 | 7252 | Switzerland ... | *Valve Generators for Ultra Short Waves Based on Transit Time Control (Transator and Turbator).* (F. Ludi, Brown Boveri Review, Vol. 28, No. 12, Dec., 1941, pp. 395-396.) |
| 548 | 7428 | G.B. ... ... | *Progress in Short Wave Broadcasting.* (Engineering, Vol. 155, No. 4,016, 1/1/43, p. 17.) |
| | | | *Military Radio.* |
| 549 | 7222 | U.S.A. ... | *Radio Control for Model Gliders.* (J. R. Custin, Model Aeroplane News, Vol. 27, No. 4, Oct., 1942, pp. 19 and 42-46.) |
| 550 | 7253 | Switzerland ... | *Methods for the Automatic Scrambling of Speech (Wireless Transmission Secrecy).* (G. Guanella, Brown Boveri Review, Vol. 28, No. 12, Dec., 1941, pp. 397-408.) |
| 551 | 7254 | Switzerland ... | *Portable Military Wireless Equipment.* (K. Lutz, Brown Boveri Review, Vol. 28, No. 12, Dec., 1941, pp. 413-414.) |
| 552 | 7255 | Switzerland ... | *Aircraft Wireless (Short Wave Transmitter).* (W. Windecke, Brown Boveri Review, Vol. 28, No. 12, Dec., 1941, pp. 414-417.) |
| 553 | 7357 | G.B. ... ... | *German Radio Equipment (Ju. 88 and He. 111).* (Airc. Eng., Vol. 14, No. 166, Dec., 1942, pp. 342-357.) |
| | | | *Abstracts.* |
| 554 | 6039 | G.B. ... ... | *Abstracts and References (Compiled by the Radio Research Board).* (December, 1942.) |

## Electricity.

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 555 | 7238 | G.B. ... ... | *Manufacture of Accumulators (Ediswan).* (Electronic Engineering, Vol. 14, No. 178, Dec. 1942, p. 283.) |
| 556 | 7319 | U.S.A. ... | *Fluorescent Microscope Lamp.* (L. H. Berkelhamer, Ind. and Eng. Chem. (Anal. Ed.), Vol. 14, No. 10, 16/10/42, pp. 833-834.) |

## Motor Transport.

*Design and Operation.*

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 557 | 5981 | Germany ... | *Spring Mounted Wheels as an Alternative to the Pneumatic Tyre.* (S. v. Szenasy, Motor Schau, Vol. 6, No. 9, Sept., 1942, pp. 371-374.) |
| 558 | 5999 | G.B. ... ... | *Railcar Oil Engine in the Argentine.* (C. B. Parker, Engineer, Vol. 174, No. 4,533, 27/11/42, pp. 437-439.) |
| 559 | 7100 | Germany ... | *Pistons of Modern Motor Car Engines.* (H. Schwarz, Progressus, Vol. 7, No. 1, Jan., 1942, pp. 26-32.) |
| 560 | 7115 | Germany ... | *Light Alloy Railway Coaches.* (Ad. M. Hug, Aluminium, Vol. 24, No. 9, Sept., 1942, pp. 307-312.) |
| 561 | 7116 | Germany ... | *The Utilisation of Light Alloys in Modern Transport Vehicles (Collection of Abstracts from the German Press).* (F. Reidenmeister, Aluminium, Vol. 24, No. 9, Sept., 1942, pp. 312-314.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 562 | 7227 | U.S.A. ... | *Car Miles per Gallon Improved by Full Throttle Operation.* (L. E. Hebl, Nat. Pet. News, Vol. 34, No. 42, 21/12/42, pp. 30-32.) |
| 563 | 7229 | S. America ... | *Railcar Oil Engine in the Argentine.* (C. R. Parker, Engineer, Vol. 174, No. 4,534, 4/12/42, pp. 464-466.) |
| 564 | 7299 | S. America ... | *Railcar Oil Engines in the Argentine.* (C. R. Parker, Engineer, Vol. 174, No. 4,535, 11/12/42, pp. 483-486.) |
| 565 | 7408 | U.S.A. ... | *Tubeless Tyre for Transport Vehicles.* (Nat. Pet. News, Vol. 34, No. 45, 11/11/42, p. 8.) |
| 566 | 7462 | U.S.A. ... | *The Use of Expander Rings to Prevent Excessive Cylinder Reconditioning (Digest).* (P. E. Friend, S.A.E.J., Vol. 50, No. 11, Nov., 1942, pp. 35 and 57-58.) |
| | | | *Alternative Fuel and Gas Generators.* |
| 567 | 5982 | Sweden ... | *New Swedish Mobile Gas Generators.* (R. Otte, Motor Schau, Vol. 6, No. 10, Oct., 1942, pp. 402-408.) |
| 568 | 6099 | G.B. ... ... | *Alternative Fuels.* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 423-432.) |
| 569 | 7000 | G.B. ... ... | *Modified Government Gas Producer, Type P.S.V.* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 433-437.) |
| 570 | 7001 | G.B. ... ... | *B.C.U.R.A. Producer (British Coal Utilisation Research Association).* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 437-438.) |
| 571 | 7002 | G.B. ... ... | *The Bellay Gas Producer.* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 439-446.) |
| 572 | 7003 | ... ... | *B.V.P. Gas Producer (British Vehicle Producer Gas, Ltd.).* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 446-449.) |
| 573 | 7004 | G.B. ... ... | *Cowan Producer.* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 449-456.) |
| 574 | 7005 | G.B. ... ... | *Emers—Sentinel Gas Producer.* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 453-456.) |
| 575 | 7006 | G.B. ... ... | *H.M.L. Gas Producer (Hamilton Motors, Ltd.).* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 456-458.) |
| 576 | 7001 | ... ... | *H.S.G. Gas Producer.* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 458-462.) |
| 577 | 7008 | G.B. ... ... | *Government Gas Producer Mark VI (Light Commercial Vehicles).* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 462-463.) |
| 578 | 7009 | G.B. ... ... | *C. and W. Gas Producers for Small Cars.* (Autom. Eng., Vol. 32, No. 429, Nov., 1942, pp. 463-464.) |
| 579 | 7196 | G.B. ... ... | *Effect of Compression Ratio on Performance with Producer Gas.* (J. Spiers and E. Giffen, Autom. Eng., Vol. 32, No. 431, Dec., 1942, pp. 523-527.) |
| 580 | 7369 | Germany ... | *Increased Use of Liquid Gas (Propane and Lutane) for Transport Vehicles.* (Ind. and Eng. Chem. (News Ed.), Vol. 20, No. 20, 25/10/42, p. 1,313.) |
| 581 | 7410 | Germany ... | *Mobile Producer Gas Plant (Charcoal).* (W. Heller, El Progresso de la Ingenieria, Vol. 23, No. 3, May, 1942, pp. 41-46.) |

| ITEM NO. | R.T.P REF | | TITLE AND JOURNAL. |
|---|---|---|---|
| | | | *Military Aspects.* |
| 582 | 7145 | U.S.S.R. ... | *Russian Roads in Winter (Coping with Snowdrifts, Methods of Clearing Snow, Construction of Special Snow Roads, etc.).* (B. Wehner, Z.V.D.I., Vol. 86, No. 43-44, 31/10/42, p. 654.) |
| 583 | 7409 | U.S.A. ... | *Canvas Bag Containers for Rail Transport of Motor Fuels.* (Nat. Pet. News, Vol. 34, No. 45, 11/11/42, No. 26.) |
| 584 | 7431 | G.B. ... ... | *Armoured Fighting Vehicles in* 1942. (Engineer, Vol. 175, No. 4,538, 1/1/43, pp. 15-19.) |

## Meteorology.

| | | | |
|---|---|---|---|
| 585 | 5995 | G.B. ... ... | *The Minnesota Dust Counter (Impingement Type) Microfilms.* (Engineering, Vol. 154, No. 4,010, 20/11/42, pp. 401-404.) |
| 586 | 7074 | U.S.A. ... | *Measurement of Ultra Violet Solar and Sky Radiation Intensities in High Latitudes.* (W. W. Coblentz and others, J. Res. Bureau of Stands., Vol. 28, No. 5, May, 1942, pp. 581-591.) |
| 587 | 7219 | G.B. ... ... | *The Temperature of the Atmosphere (Digest).* (T. G. Couling, Nature, Vol. 150, No. 3,815, 12/12/42, pp. 636-687.) |
| 588 | 7303 | G.B. ... ... | *Atmospheric Pollution.* (Engineering, Vol. 154, No. 4,014, 18/12/42, p. 495.) |
| 589 | 7447 | Germany ... | *The Effect of Atmospheric Haze on the Camouflaging of Aerial Targets.* (F. Lohle, Luftwissen, Vol. 9, No. 9, Sept., 1942, pp. 258-262.) |

## Physiology and Aviation Medicine.

| | | | |
|---|---|---|---|
| 590 | 7157 | Germany ... | *Smoke Poisoning (Cause and Nature).* (D. Leu, Z.G.S.S., Vol. 37, No. 9, Sept., 1942, pp. 174-176.) |
| 591 | 7160 | Germany ... | *Carbon Dioxide Breathing at High Altitudes and its Effect on Oxygen Want.* (A. Ruhl and W. Spiess, Luftfahrtmedizin, Vol. 1, No. 4, 24/4/37, pp. 272-291.) |
| 592 | 7161 | Germany ... | *Pulse Rate and Blood-Pressure as Affected by Gradually Decreasing and Increasing Pressures in the Low Pressure Chamber.* (G. Besseres, Luftfahrtmedizin, Vol. 1, No. 4, 24/4/37, pp. 301-306.) |
| 593 | 7162 | Germany ... | *The Time Reserve of Human Beings After Interruption of the Oxygen Supply at High Altitudes.* (Luftfahrtmedizin, Vol. 3, No. 1, 1938-1939, pp. 55-63.) |
| 594 | 7163 | Germany ... | *On the Causes and Prevention of Severe Internal Injuries in Gliding Accidents. The Problem of the Capacity of the Body to Endure Extreme Impact Shock is also Discussed.* (Luftfahrtmedizin, Vol. 3, No. 2, 1938-1939, pp. 267-276.) |
| 595 | 7164 | Germany ... | *The Oxygen Saturation of the Blood when Breathing CO at High Altitudes.* (H. Diringshofen, Luftfahrtmedizin, Vol. 3, No. 2, 1938-1939, pp. 216-217.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 596 | 7165 | Germany ... | *On the Problem of Acclimatization to Oxygen Deficiency at Low Pressure.* (H. Kaltze and W. Kuhn, Luftfahrtmedizin, Vol. 3, No. 2, 1938-1939, pp. 183-190.) |
| 597 | 7166 | Germany ... | *Development of Abnormal Symptoms in the Lungs and Heart as a Result of Adaptation to Flying Conditions.* (Luftfahrtmedizin, Vol. 3, No. 2, 1938-1939, pp. 104-115.) |
| 598 | 7226 | G.B. ... ... | *The Functions and Performance of the Eye.* (W. D. Wright, J. Scient. Insts., Vol. 19, No. 11, Nov., 1942, pp. 161-165.) |
| 599 | 7325 | G.B. ... ... | *British Research in Aviation Medicine.* (Times Trade and Engineering, Vol. 52, No. 945, Nov., 1942, p. 35.) |
| 600 | 7494 | U.S.A. ... | *The Syndrome of Hyperventilation. Its Importance in Aviation. (H. C. Hinshaw, Procs. Staff Meeting of Mayo Clinic, 1941, Vol. 16, No. 14, pp. 211-213.)* (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 512.) |
| 601 | 7495 | Germany ... | *Oxygen Deficiency in the Cerebral Circulation (Noell-Schnieder, Luftfahrtmed., Aug. 30, 1941, Vol. 5, Pt. 3, p. 234.)* (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 512.) |
| 602 | 7496 | U.S.A. ... | *The Cardiovascular Aspects of Aviation Medicine. (J. R. Poppen, New England J. of Med., Vol. 225, No. 23, Dec. 4, 1941, pp. 892-896.)* (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, pp. 512-513.) |
| 603 | 7497 | G.B. ... ... | *The Use of the Tilt-Table Test in Aviation Medicine. (A. Graybiel and R. A. McFarland, J. Aviation Med., Vol. 12, No. 3, 1941, pp. 194-211.)* (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 513.) |
| 604 | 7498 | G.B. ... ... | *Recent Trends in Aviation Medicine. (J. R. Poppen, J. of Aviation Med., Vol. 12, No. 1, March, 1941, pp. 57-71.)* (Bulletin of War Medicine, 1941, p. 509.) |
| 605 | 7499 | Germany ... | *Influence of Tangential Forces on the Human Organism. (S. Ruff, Wien. Klin. Wach., Vol. 52, Sept. 15, 1939, p. 861.)* (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, pp. 509-510.) |
| 606 | 7500 | G.B. ... ... | *A Mask Apparatus which Provides High Oxygen Concentrations with Accurate Control of the Percentage of Oxygen in the Inspired Air without Accumulation of Carbon Dioxide. (A. L. Barach and M. Eckman, J. Av. Med., Vol. 12, No. 1, March, 1941, pp. 39-52.)* (Bull. of War Med., Vol. 2, No. 6, July, 1942, p. 511.) |
| 607 | 7501 | G.B. ... ... | *Special Problems of the R.C.A.F. Medical Officer. (G. E. Hall, Canadian Med. Ass. J., Vol. 45, No. 5, Nov., 1941, pp. 387-390.)* (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, pp. 511-512.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 608 | 7502 | U.S.A. ... | *The Importance of the "Nervous Energy Reserve" in Aviation.* (*M. N. Walsh, Procs. Staff Meeting Mayo Clinic, Vol.* 6, *No.* 45, *Nov.*, 1941, *pp.* 709-714.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 516.) |
| 609 | 7503 | Germany ... | *Neurologic and Psychologic Aspects of Aviation Medicine. A Review of the Literature.* (*H. Lottig, Fortscht. d. Neurol. Psychiat., Vol.* 11, *Nov.*, 1939, *pp.* 441-454.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, pp. 516-518.) |
| 610 | 5704 | Germany ... | *Biologic Effect of High Altitude from the Point of View of Aviation.* (*H. Strughold, Wien. Klin. Woch., Vol.* 52, *Sept.*, 1939, *p.* 857.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, pp. 519-520.) |
| 611 | 7505 | Hungary ... | *Sudden Turning of the Head as a Cause of Sudden Death in Flyers.* (*Orsaferene Orsovi-Hetilap, Hungary,* 1940, *p.* 554.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 521.) |
| 612 | 7506 | Italy ... ... | *Changes in Altitude Resistance Through Alterations of the Acid-Base Balance in the Blood.* (*Margaria and Faraglia, Bull. Soc. ital. Biol. sper, Vol.* 15, 1940, *p.* 1,096.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 513.) |
| 613 | 7507 | Spain ... | *Arterial Blood Pressure in Pilots.* (*Vega Herrera, Semana Med., Vol.* 46, *Oct.*, 1939, *p.* 981.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 513.) |
| 614 | 7508 | Germany ... | *Circulatory Collapse during Great Acceleration in Airplanes.* (*S. Ruff, Med. Klin., Vol.* 26, *Jan.*, 1940, *p.* 69.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 514.) |
| 615 | 7509 | Germany ... | *Increased Danger in Circulatory Collapse Due to Simultaneous Action of Altitude and Acceleration in Airplanes.* (*Verhandl. d. deut. Gesellsch. f. Kreislaufforsch., Vol.* 13, 1940, *p.* 92.) (Bulletin of War Med., Vol. 2, No. 6, July, 1942, pp. 515-516.) |
| 616 | 7511 | U.S.A. ... | *The Ear in Flying.* (*J. R. Poppen, Larynoscope, Vol.* 51, *No.* 10, *Oct.*, 1941, *pp.* 974-982.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 521.) |
| 617 | 7512 | U.S.S.R. ... | *Changes in the Excitability of the Vestibular Apparatus following Repeated Stimulation-Significance for Aviators.* (*O. M. Frenkel, Bull. Biol. et Med. exper., Vol.* 9, *p.* 69.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, pp. 521-522.) |
| 618 | 7513 | Germany ... | *Muscosal Detachment of Paranasal Sinuses in Aviators.* (*A. Hermann, Luftfahrtmedizin, Vol.* 5, *No.* 3, 1941, *pp.* 271-277.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 522.) |
| 619 | 7514 | G.B. ... ... | *Differences in Judgment of Depth Perception Between Stationary and Moving Objects.* (*R. Y. Walter, J. Aviation Med., Vol.* 12, *No.* 3, 1941, *pp.* 218-225.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, pp. 522-523.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 620 | 7515 | India ... | *Dark Adaptation Tests in Cases of Clinical Night Blindness.* (*K. Rajagapal, Indian J. Med. Res., Vol.* 29, *No.* 2, *April*, 1941, *pp.* 351-360.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 523.) |
| 621 | 7516 | G.B. ... ... | *Vitamin A and Dark Adaptation: Effect of Alcohol, Benzedrene and Vitamin C.* (*S. Yudkin, Lancet, Dec.* 27, 1941, *pp.* 787-791.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 524.) |
| 622 | 7517 | Germany ... | *Gastric Disorders in Flying Personnel.* (*R. Mallison, Deut Militarant, Vol.* 5, *Oct.*, 1940, *pp.* 411-413.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, pp. 524-525.) |
| 623 | 7518 | U.S.A. ... | *Parachute Injuries.* (*W. J. Tobin and others, J. Am. Med. Ass., Vol.* 117, *No.* 16, *Oct.* 18, 1941, *pp.* 1,318-1,321.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, p. 525.) |
| 624 | 7519 | G.B. ... ... | *Hours of Work, Lost Time and Labour Wastage.* (*Med. Res. Council Indust. Health Res. Board, Emergency Report No.* 2, *p.* 26, 1942. *London, H.M.S.O.*, 6d.) (Bulletin of War Medicine, Vol. 2, No. 6, July, 1942, pp. 525-526.) |
| 625 | 7521 | G.B. ... ... | *Preventive Work in Connection with T.N.T. Poisoning, pp.* 177-180. (*Ministry of Munitions of War, Official History of the Scottish Filling Factory* (*No.* 4 *National*), *Georgetown, Renfrewshire*, 1919.) (Bulletin of War Med., Vol. 2, No. 6, July, 1942, p. 527.) |
| 626 | 7522 | Germany ... | *Occupational Diseases of the Skin.* (*A. M. Memmesheimer, Med. Klin., Vol.* 38, *No.* 3, *Jan.* 16*th*, 1942, *pp.* 53-54.) (Bulletin of War Medicine, Vol. 11, No. 6, July, 1942, p. 528.) |
| 627 | 7523 | G.B. ... ... | *A New Colorimetric Method for the Determination of T.N.T.* (2, 4, 6, *Trinitrotoluene*) *in Air.* (*S. S. Pinto and J. P. Fahy, J. Industrial Hyg. and Toxicl., Vol.* 24, *No.* 2, *Feb.*, 1942, *pp.* 24-26.) (Bulletin of War Med., Vol. 2, No. 6, July, 1942, pp. 528-529.) |
| 628 | 7524 | G.B. ... ... | *Luminous Paints, Protection of Workpeople.* (*Lancet, May* 23, 1942, *pp.* 628-629.) (Bulletin of War Medicine, Vol. 3, No. 4, Dec., 1942, p. 235.) |
| 629 | 7525 | U.S.A. ... | *Clinical and Sub-Clinical Lead Intoxication.* (*H. E. Abraham and J. A. Baird, War Med., Chicago, Vol.* 2, *No.* 3, *May*, 1932, *pp.* 450-453.) (Bulletin of War Medicine, Vol. 3, No. 4, Dec., 1942, p. 235.) |
| 630 | 7526 | G.B. ... ... | *The Examinations and Selection of Aviators.* (*L. H. Bauer, New International Clinics, Vol.* 1 (*N.S.*5), 1942, *pp.* 1-15.) (Bulletin of War Medicine, Vol. 3, No. 4, Dec., 1942, p. 232.) |
| 631 | 7527 | G.B. ... ... | *The Psychological Aspects of Flying, with Special Reference to Problems of Selection.* (*R. A. Macfarland, New International Clinics, Vol.* 1 (*N.S.*5), 1942, *pp.* 16-34.) (Bulletin of War Med., Vol. 3, No. 6, Dec., 1942, p. 232.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 632 | 7528 | G.B. ... | ... *The Effects of Altitude on the Flyer.* (*H. G. Armstrong, New International Clinics, Vol.* 1 (*N.S.*5), 1942, *pp.* 35-45.) (Bulletin of War Medicine, Vol. 3, No. 6, Dec., 1942, p. 232.) |
| 633 | 7529 | G.B. ... | ... *The Physical Maintenance of the Pilot.* (*A. D. Tuttle, New International Clinics, Vol.* 1 (*N.S.*5), 1942, *pp.* 46-59.) (Bulletin of War Medicine, Vol. 3, No. 6, Dec., 1942, p. 232.) |
| 634 | 7530 | G.B. ... | ... *The Effects of Cold and High Speed on the Flyer.* (*J. R. Coppen, New International Clinics, Vol* 1 (*N.S.*5), 1942, *pp.* 60-67.) (Bulletin of War Medicine, Vol. 3, No. 6, Dec., 1942, p. 232.) |
| 635 | 7531 | Australia | ... *Medical Problems in Practical Flying.* (*S. M. L. Dunstone, Med. J., Australia, Vol.* 1, *No.* 14, *April* 4*th*, 1942, *pp.* 397-400.) (Bulletin of War Medicine, Vol. 3, No. 6, Dec., 1942, p. 231.) |
| 636 | 7532 | G.B. ... | ... *The Compensatory Mechanism of the Splanchnic Circulation During Changes of Posture.* (*O. G. Edholm, J. Physiology, Vol.* 101, *No.* 1, *June* 2, 1942, *pp.* 1-10.) (Bulletin of War Medicine, Vol. 3, No. 4, Dec., 1942, p. 231.) |
| 637 | 7533 | G.B. ... | .. *The Effect of Flight Upon Hearing.* (*P. A. Campbell, J. Aviation Med., Vol.* 13, *No.* 1, *March*, 1942, *pp.* 56-60.) (Bulletin of Medicine, Vol. 3, No. 4, Dec., 1942, pp. 231-232.) |
| 638 | 7534 | Germany | ... *Testing of Night Vision by the Nyktometer.* (*R. Braun, Deut. Militararzt, Vol.* 7, *No.* 1, *Jan.*, 1942, *pp.* 31-35.) (Bull. of War Medicine, Vol. 111, No. 4, Dec., 1942, p. 232.) |
| 639 | 7535 | G.B. ... | .. *The Personal Factor in Accidents.* (*Medical Research Council, Indust. Health Research Board, Emergency Report No.* 3, *pp.* 92, 1942. *London, H.M.S.O.*, 4*d.*) (Bulletin of War Med., Vol. 3, No. 4, Dec., 1942, pp. 222-223.) |
| 640 | 7536 | U.S.A. | . *Industrial Hygiene in Aircraft Plants.* (*Calif. State Dept. of Health Weekly Bull., Vol.* 20, *Jan.* 10*th*, 1942, *p.* 203.) (Bulletin of War Medicine, Vol. 111, No. 4, Dec., 1942, pp. 233-234.) |
| 641 | 7537 | G.B. ... | ... *The Physiologic Action of Metallic Magnesium.* (*S. F. Meek and others, J. Indust. Hyg. and Toxic., Vol.* 24, *No.* 6, *June*, 1942, *pp.* 42-47.) (Bulletin of War Medicine, Vol. 3, No. 4, Dec., 1942, p. 234.) |
| 642 | 7538 | G.B. ... | .. *Wounds Caused by Magnesium Fragments.* (*R. Z. Schulz and C. W. Walter, J. Indust. Hyg. and Toxicol., Vol.* 24, *No.* 6, *June*, 1942, *pp.* 148-153.) (Bulletin of War Medicine, Vol. 3, No. 4, Dec., 1942, p. 234.) |
| 643 | 7539 | U.S.A. | ... *Occupational Hazards to Young Workers, Report No.* 6, *Radioactive Substances.* (*U.S. Dept. of Labour, Children's Bureau, March* 4, 1942, *pp.* 20.) (Bulletin of War Medicine, Vol. 3, No. 4, Dec., 1942, p. 234.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 644 | 7540 | G.B. ... | *Ventilation Requirements for Radium Dial Painting. (W. C. L. Hemeon and R. D. Evans, J. Indust. Hyg. and Toxicol., Vol.* 24, *No.* 5, *May,* 1942, *pp.* 116-120.) (Bulletin of War Medicine, Vol. 3, No. 4, Dec., 1942, pp. 233-234.) |
| 645 | 7541 | U.S.A. | *Physiology and High Altitude Flying: With Particular Reference to Air Embolism. (J. F. Fulton, Science, Feb.* 27, 1942, *pp.* 207-212.) (Bulletin of War Medicine, Vol. 3, No. 3, Nov., 1942, p. 175.) |
| 646 | 7542 | U.S.A. | *Oxygen Supply Systems for Military Flying. (J. R. Pappen, Bull. New York Acad. Med., Vol.* 18, *No.* 2, *Feb.,* 1942, *pp.* 102-111.) (Bulletin of War Medicine, Vol. 3, No. 3, Nov., 1942, pp. 175-176.) |
| 647 | 7543 | U.S.A. | *The Problem of Deafness in Aviators. (C. C. Bunch, War Medicine, Chicago, Vol.* 1, *No.* 6, *Nov.,* 1941, *pp.* 873-886.) (Bulletin of War Medicine, Vol. 3, No. 3, Nov., 1942, p. 176.) |
| 648 | 7544 | G.B. ... | *Some Limitations of the Electrocardiogram in the Physical Examination for Flying. (C. E. Kossmann, J. Av. Med., Vol.* 13, *No.* 1, *March,* 1942, *pp.* 26-34.) (Bulletin of War Med., Vol. 3, No. 3, Nov., 1942, p. 177.) |
| 649 | 7545 | G.B. ... | *Miniature Mass Radiography in the R.A.F. Review of* 20,000 *Exams. (R. R. Trail, Lancet, May* 27*th,* 1942, *pp.* 609-610.) (Bulletin of War Medicine, Vol. 3, No. 3, Nov., 1942, p. 177.) |
| 650 | 7546 | U.S.A. | *A Note on the Hygroscopic Properties of Clothing in Relation to the Human Heat Loss. (J. H. Nielbach and L. P. Herrington, Science, April* 10*th,* 1942, *pp.* 387-388.) (Bull. of War Med., Vol. 3, No. 3, Nov., 1942, pp. 178-179.) |
| 651 | 7450 | Germany | *A Comparison of Direct and Alternating Current Supply in Aircraft on the Basis of Danger of Electrocution.* (H. Viehmann, Luftwissen, Vol. 9, No. 9, Sept., 1942, pp. 268-269.) |

## Photography.

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 652 | 5996 | G.B. ... | *Microfilms in the Library.* (Engineering, Vol. 154, No. 4,010, 20/11/42, p. 412.) |
| 653 | 7010 | U.S.A. | *Characteristics of Wide Angle Aeroplane Camera Lenses. (R.P.* 1,498.) (E. Washer, J. Res. Bureau of Stands., Vol. 29, No. 3, Sept., 1942, pp. 233-246.) |
| 654 | 7025 | G.B. ... | *" Recordak " System of Microfilming.* (Mechanical World, Vol. 112, No. 2,916, 20/11/42, p. 487.) |
| 655 | 7098 | Germany | *Aerial Photogrammetry (Representative Camera and Rectification Apparatus).* (H. Belzner, Progressus, Vol. 7, No. 1, Jan., 1942, pp. 12-17.) |
| 656 | 7146 | Germany | *Photographic Reproduction and Storing of Engineering Drawings (Scale Reduction* 1/10 *Considered as a Maximum).* (H. Penther, Z.V.D.I., Vol. 86, No. 43-44, p. 661.) |

| ITEM NO. | R.T.P. REF. | | TITLE AND JOURNAL. |
|---|---|---|---|
| 657 | 7177 | U.S.A. ... | *Photographic Reversal by Desensitizing Dyes.* (B. H. Carrol and C. M. Kretchman, Bureau of Standards Journal of Research, Vol. 10, 1933, pp. 449-464.) |
| 658 | 7220 | G.B. ... ... | *Scientific Films in Teaching Physics.* (Nature, Vol. 150, No. 3,815, 12/12/42, p. 691.) |
| | | | **Mathematics.** |
| 659 | 7411 | Germany ... | *Definition of Physical Quantities by Means of "Descriptive" Equations.* (R. Thun, Z. fur Instrum., Vol. 62, No. 10, Oct., 1942, pp. 305-311.) |
| 660 | 6033 | G.B. ... ... | *Lagrangian Frequency Equations.* (J. Morris and J. W. Head, Airc. Eng., Vol. 14, No. 165, Nov., 1942, pp. 312-314 and 319.) |
| 661 | 7014 | G.B. ... ... | *Machine for Rapid Summation of Fourier Series.* (D. Macewan and C. A. Beevers, Rev. of Scientific Insts., Vol. 19, No. 10, Oct., 1942, pp. 150-156.) |
| | | | **University Training.** |
| 662 | 5979 | G.B. ... ... | *Some Notes and Suggestions on the Teaching of Physics.* (C. T. Smith, Phil. Mag., Vol. 33, No. 228, Nov., 1942, pp. 775-815.) |
| 663 | 6036 | G.B. ... ... | *The Value of Library Research.* (L. Mote, Airc. Eng., Vol. 14, No. 165, Nov., 1942, p. 320.) |
| 664 | 7142 | Germany ... | *Co-ordination of Studies at German Universities and Technical High Schools. New Degrees of "Diploma Physicist" on "Diploma Mathematician."* (Z.V.D.I., Vol. 86, No. 43-44, 31/10/42, p. 652.) |
| 665 | 7308 | G.B. ... ... | *Engineer or Physicist?* (P. Dunsheath, Engineering, Vol. 154, No. 4,013, 11/12/42, p. 474.) |