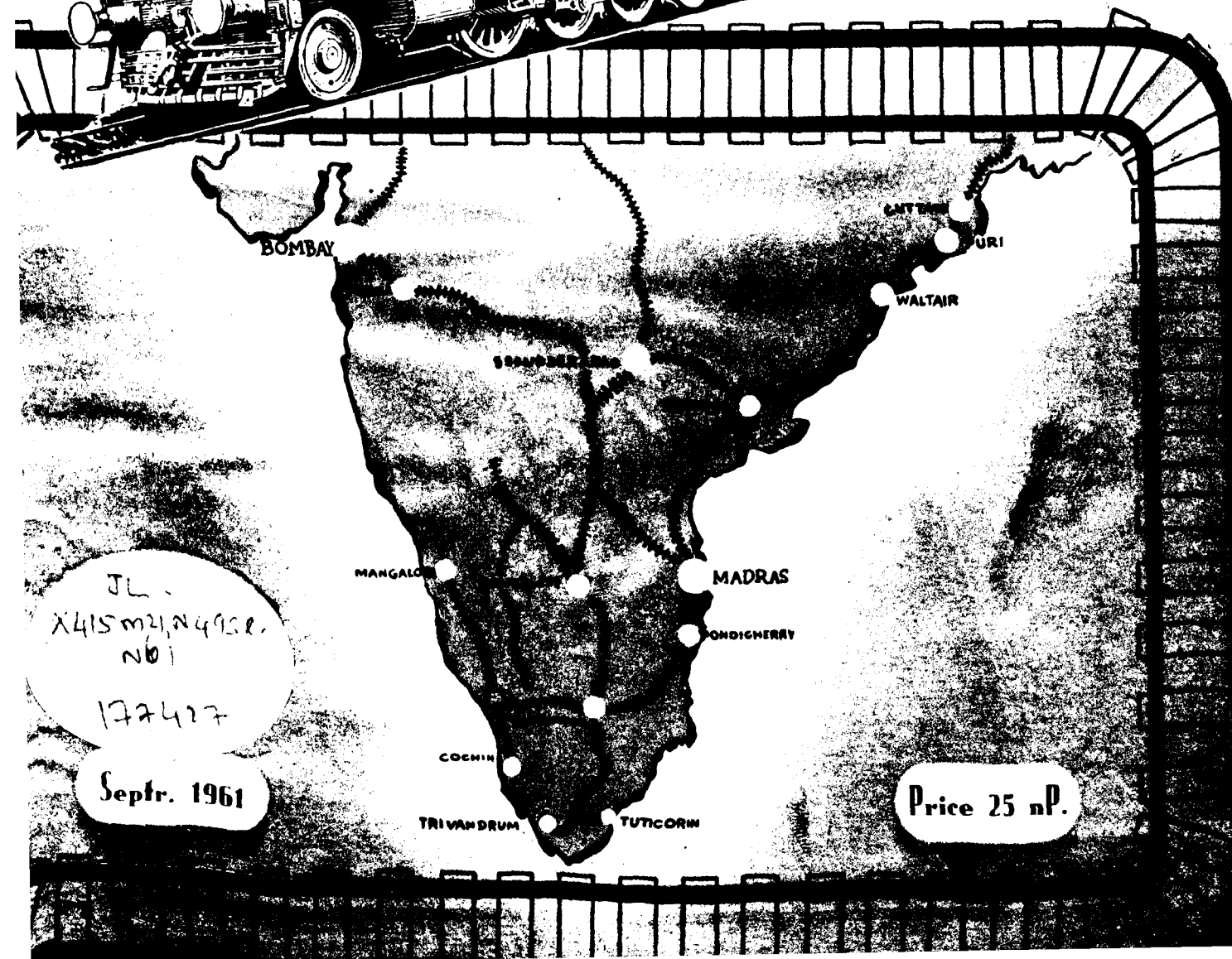
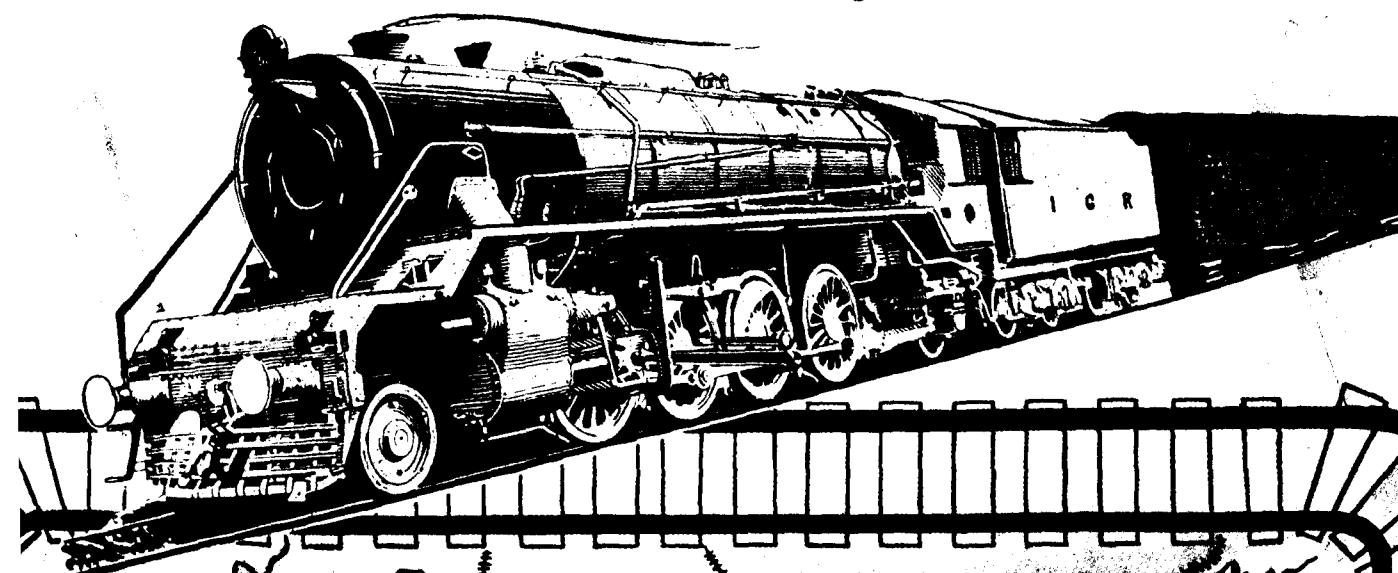


SOUTHERN RAILWAYS

Magazine



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GOLDEN RULES OF CONDUCT FOR RAILWAYMEN

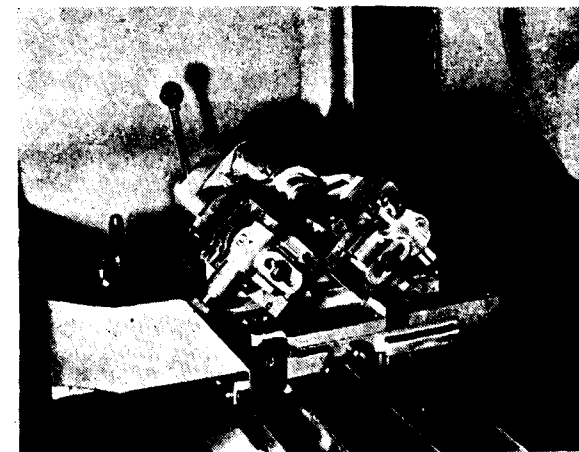
1. Do you plan your work daily? Get the more essential things done first and do not neglect the important ones sidetracking them to the fag end of the day.
2. Do not express casually careless opinion. Never venture forth an opinion unless asked for it.
3. Remember that most of our mental worries come either from trying to fight life hard or from trying to run away from life. Do neither.
4. Learn to accept people as they are, love them, respect them, praise them, encourage them, differ with them, but above all, learn the priceless art of give and take
5. Cry neither for the moon, nor over spilt milk.
6. Accept the things that you cannot change; have the courage to change the things that you can, and possess the wisdom to know the difference.
7. Do not drive too hard a bargain with yourself.
8. Accept life as it is — its wonders, changes, disappointments, frustrations etc., etc.

“Jones-Shipman” Crush-Form Grinding Machine with Automatic Cycle of Operation

THIS machine is an adaptation of a standard “Jones-Shipman” Model 1012 Crush-form Grinder of proven design and having the same predominant features for precision form grinding.

It is arranged with power driven vertical wheel feed and rapid return, hydraulic table traverse giving infinite variation of table speeds up to 80 ft. per minute, and provided only with hand cross feed for setting purposes. All controls can be electrically interlocked to a Master switch giving automatic cycle of operation.

The Master switch has two positions, “ON” and “OFF”. If the table starting lever is turned to the run position, neither the table nor the vertical feed will operate until the Master switch is turned to the “ON” position.



With the Master switch turned to the “ON” position, and the table “START” and “STOP” lever turned to the “run” position, nothing will happen until the button labelled “START CYCLE” has been depressed, but what happens then is dependent upon the position of the second switch, which has three positions and controls the feeding operation. The three positions on this switch are “UP”, “AUTOMATIC”, and “DOWN”. With this switch set in the “UP” position, the feed hand wheel will remain at the top, or “UP” position, despite operation of the “START CYCLE” button, but when the “START CYCLE” button is operated, the table will run and reverse continuously, and the table movement



Specification for 72" Spline Grinding Machine

THE machine has a capacity of 72" between centres and has a working stroke of 84" of which 66½" is useful grinding length, the remainder being occupied in "run-out" over the tailstock to the two truing positions. The centre height of the machine (workhead centre to table top) is 7" and the range of vertical adjustment of the wheelhead measured between the wheel spindle centre line and the work centre line, is from 3½" to 11½". The machine is capable of grinding zero work diameter with a wheel worn down to 7" diameter or 13" work diameter with a new 10" diameter wheel.

Note that the wheel centre line will not reach the work centre line for the purpose of grinding centres. Centre grinding can be accomplished by the use of a small portable grinding attachment (not supplied with the machine).

The wheelhead support column has no cross traverse, the necessary diamond positioning for side arc truing of the wheel being obtained from movement of the truing arrangement mounted on the table.

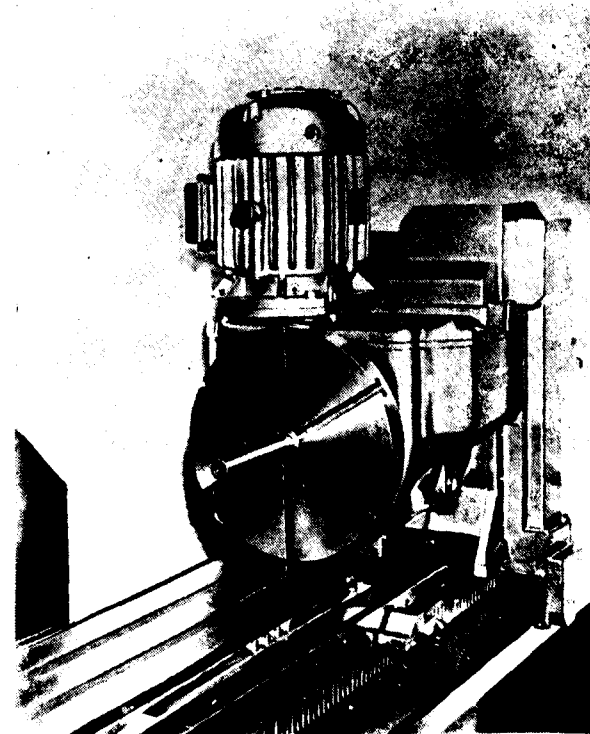
The bed of the machine is a single casting, equipped with normal vee and flat sliding surfaces and an adequate number of foundation bolt and jacking points. The table is practically fully supported by the bed, i.e. at maximum stroke there is only a very short overhang of the table slide ways. The slide ways are covered by half-guards but this half-guard system is supplemented by a covering belt which renders the slide-ways and the whole interior of the bed, fully covered.

The upper table surface has a dove-tail section and all the table equipment is clamped to the dove-tailed section. This arrangement enables the table equipment securing bolts to be easily accessible and out of the way of cross slides, etc., on truing device and tailstock.

The wheelhead support column is a large stable column, bolted directly to the back of the bed. The vertical slide for the wheelhead is bolted to the face of the column, and is slightly adjustable for angle, so that alignments concerning squareness of the wheel can be secured by an adjustment, leaving only a linear motion of the wheelhead to be arranged for by normal machining and scraping methods.

The wheelhead slide is a long slide, fitted with square gibs. Three taper adjusting strips are provided at each extremity of the wheelhead slide; these ensure a snug fit in both planes of the wheelhead to the wheelhead slide. The wheelhead is vertically adjustable by means of a handwheel working through a worm wheel and screw. The complete feeding system, including the feed screw, is entirely submerged in an oil bath.

The wheelhead feed handwheel gives .050" per rev. feed with an additional fine feed arrangement graduated in, and capable of moving the wheelhead by, increments of .0001".



The wheel spindle housing is a demountable unit; it is clamped at the front, or operating end, the rear end is mounted in an adjustable plate, this adjustment again being concerned with the maintenance of coincidence in one plane, with the line of traverse of the main table.

The wheel spindle is nitralloy, running in lead bronze bearings; thrust arrangements are provided for by a central collar engaging two sliding bronze shoes. An external adjusting knob provides a means of adjustment to the "nip" of the two shoes on the thrust collar.

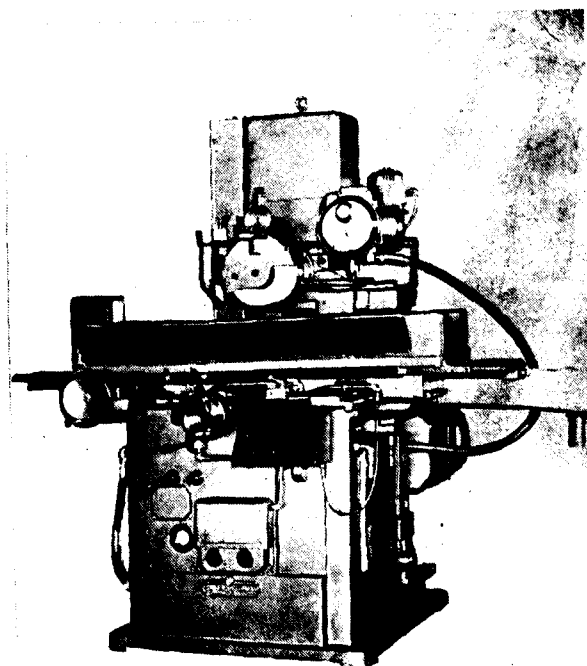
The wheel spindle can be moved over a range of $\frac{1}{2}$ " in the direction of its axis, and through its own bearings, by moving the complete thrust arrangement, using taper wedge methods controlled by a thumb wheel on top of the wheel spindle. Axial movements of the wheel spindle can be registered on a dial indicator, the whole arrangement providing a fine side feed motion which, due to the fact that the sliding member is itself the wheel spindle, gives adequate sensitivity. Axial movements of the wheel during warming up from cold to normal running temperature cannot be avoided, but their effects are kept to a minimum by keeping the running temperature as low and as constant as possible. To this end, the wheel spindle bearings are of a type which tends to run at constant temperature, setting its own clearances to suit, and wheel spindle lubricant contains fair proportion of Kerosene.

The wheel spindle nose is extended to allow the usage of wide wheels or pairs of wheels, it has a taper nose. A section through wheel spindle nose, showing the types of wheel collets possible. Wheel collets can be provided to suit user requirements, they are omitted from this present quotation and will be quoted for separately upon establishment of requirements.

Returning to the table equipment, the indexing workhead is hydraulically operated from its own self-contained unit, but is electrically signalled into and out of action. The accuracy of indexing is dependent solely upon a notched plate, a pivoting indexing pawl is kept in contact with one face of the notch, both by a plunger under spring load, and by hydraulic torque. The maximum number of notches catered for as standard is 48. This figure can be extended to suit special requirements at extra cost. One index plate having 48 notches, with masking plates to give 2, 3, 4, 6, 8, 12, 16 and 24 divisions, is provided with the machine; extra index plates can be quoted for separately. To change the indexing sequence it is

necessary to change only the index and/or masking plates.

The tailstock has a main sliding member supported on dove tail guides. For maximum stability, the vertical adjustment of the tailstock is provided for by arranging the main frame as a pivoted member, the pivot centres being set so that small vertical increments do not significantly alter the cross adjustment. There is a sliding base provided, upon which cross adjustments can be made.

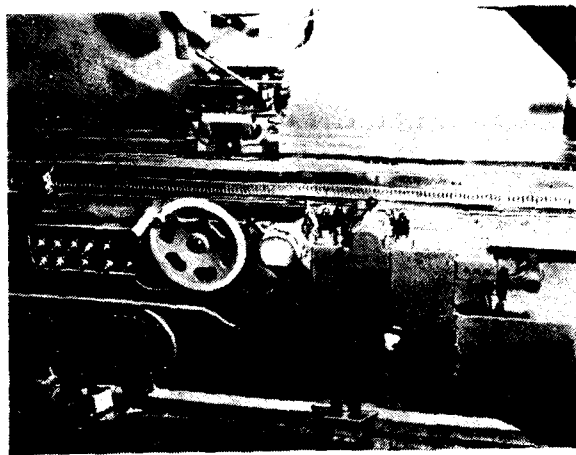


The tr

table will not move, thus, when automatically stopped in such fashion, the hydraulic system is running under reduced load. The reversing lever will remain set to move the table to the right, although the table will be stationary. Side truing may be carried out at this position. Movement of the "stop-start" lever can then engage the hand traverse and the table can be hand wound leftwards to the radial truing position. Hand traverse may then be disengaged and the throttle re-opened. The table will not move leftwards, however, until the reverse lever is thrown over to cause it to so move, or, reversing lever may be thrown over to cause the table to move to the right before the throttle is opened, in which case the table will move to the right when the throttle is opened.

The foregoing describes the conditions with the indexing operations switched "out". With the indexing switch "in", the table will run leftwards and reverse normally at the workhead end, and will then run rightwards and come to the left-hand reversing point, slow, down, and throw over the reversing lever.

Attached to the workhead is a cam which can be rotated through 90° by contact with an indexing dog, the dog being slidably adjustable on a carrier ("index rail"), at the right hand end of the machine. This dog should be set to operate the index cam as soon as the wheel is out of the cut, and just before the left-hand reversing point is reached.



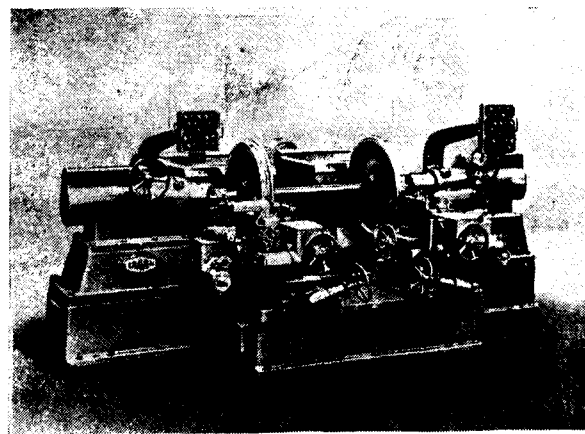
The signal to index is given when the index cam is rotated through 90° by the index dog. When so rotated, a spring loaded index locking plunger engaging a notched index disc in the workhead is hydraulically withdrawn. A hydraulic motor causes the workhead to rotate until an index paw

Recent Development in Machine Tools for Reconditioning Railway Wheels and Axles

THE new Craven Friction Roller Drive Wheel Lathe is indicative of the changing requirements in railway workshops as a result of the rapid change over from steam to diesel and electric motive power. The lathe effects important economies in work setting times and is provided with automatic profile copying equipment; it is admirably suited to re-turning wheel sets at frequent intervals to maintain the requisite high degree of tread and flange form accuracy on diesel and electric traction wheel sets.

This recent development provides for the use of carbide cutting tools for re-turning brake and skid-hardened wheel sets with plain or roller journal bearing axle boxes in position. The wheel set is carried between revolving centres and the "Craven" patent drive is by a pair of friction rollers to each wheel. The rollers are tapered and engage the wheel rim at an angle, each pair being mounted in independent and opposed sliding blocks, which are hydraulically operated to provide a fully balanced, self-contained thrust of sufficient pressure to transmit the necessary driving torque. The adjustment between each pair of rollers adequately accommodates wheels of varying width.

The friction roller drive saddles are separate, but advance in unison to the driving position and are



In this wheel lathe the wheel sets are supported between centres and are driven by hydraulically-loaded friction rollers.

turning, but to be quickly released and swivelled about a vertical fulcrum by handlever to produce either hand of journal radius.

An electrical wheel lift is provided for raising the wheel set into line with the machine centres after being rolled into position on rails. A hand brake quickly

brings the workpiece to rest and assists in the withdrawal of the driving dogs.

The left-hand headstock has electrically-operated longitudinal adjustment upon its sandwich plate for setting to suit different lengths of axle. Both headstock assemblies have hand adjustment upon the bed.

NEW EXPRESSES FOR INTERSTATE TRAVELLERS

Two new air-conditioned expresses for the run between Sydney, capital city of the State of New South Wales, and Melbourne, capital city of the State of Victoria, will go into service when the uniform gauge line is completed.

Easter, 1962, has been set as the target for the introduction of these trains.

The trains hauled by two 1800 h.p. locomotives at express speeds, will represent an investment of nearly £2 million.

The required 34 carriages (including spare ones) will be of gleaming stainless steel and built by Common Wealth Engineering Co. at its Granville (N.S.W.) Works.



AXLE-SUSPENDED TRACTION MOTOR FOR D.C. AND RECTIFIED A.C.

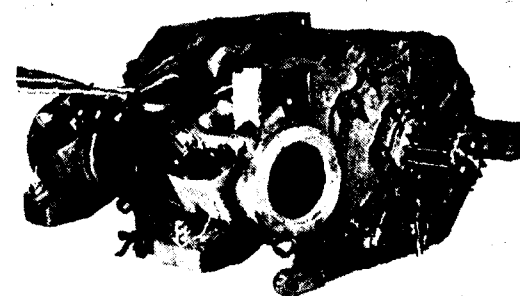
A SELF-VENTILATED axle-suspended traction motor has recently been developed by Crompton Parkinson Ltd., the motor, designated type C.152, being suitable for operation on D.C. systems and on rectified single-phase A.C. at industrial frequency. Commutation is very satisfactory even with ripple up to 30%, and with terminal voltage 20% above rated voltage, this being the result of skilful detail design. It is designed for a rated voltage of 750 volts, but is insulated for operation on a 1500 volts supply, and is therefore applicable to rectifier vehicles in dual operation on single-phase 50-cycles A.C. systems as well as on 1500 volts D.C. systems.

The motor conforms in every respect with B. S. 173, and is Class 'B' insulated throughout, armature and field coils being fully bakelised. Field weakening is obtained by means ofappings.

The ratings of the C.152 motor on rectified single-phase, 50-cycles A.C. are shown below.

Similar motors can be supplied for larger outputs—as required for main line locomotives, with forced ventilation and suitable flexible transmission. Alternative versions available have special high speed construction and lower outputs for use with cardan-shaft drives to high-ratio right-angle drive gearboxes.

The following ratings are those of the prototype machines having Class 'B' insulation; Class 'F'



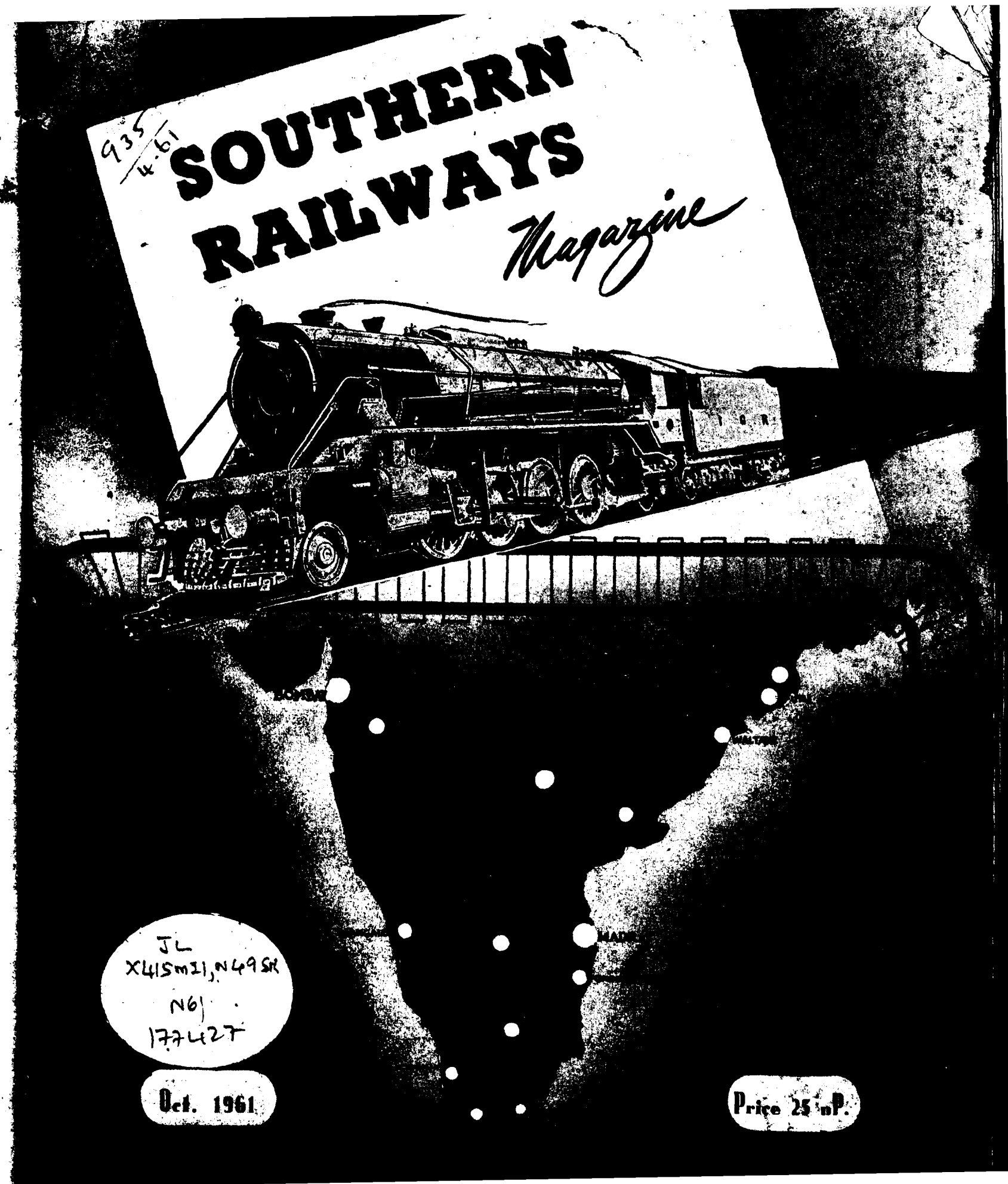
CLEANLINESS LEADS TO HEALTH AND HAPPINESS

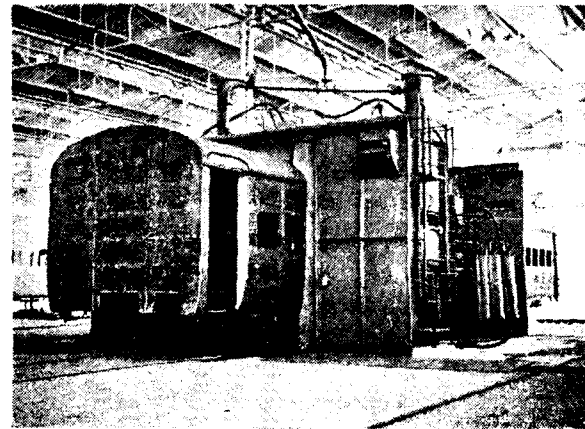
Clean orderly habits contribute to general health and welfare and as such to happiness and prosperity; they are more important than medicines.

Cleanliness prevents disease; medicine only attempts to cure.

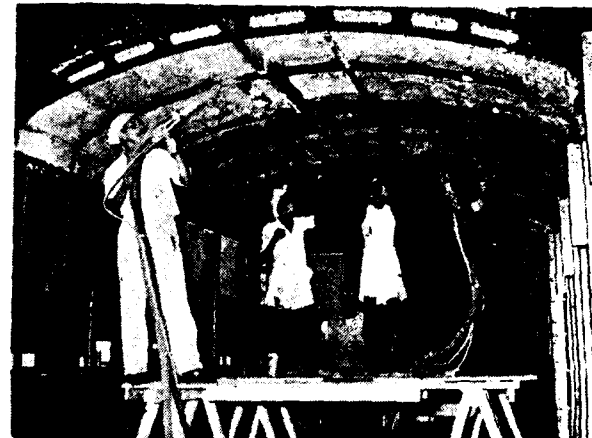
Cleanliness of the person, of the houses and colonies, reflects discipline in the individual and the community. Discipline is the foundation stone for progress of oneself and the country. Cleanliness is a good habit. It is also cheap.

All Railwaymen should set an example of cleanliness. This will help others and themselves.

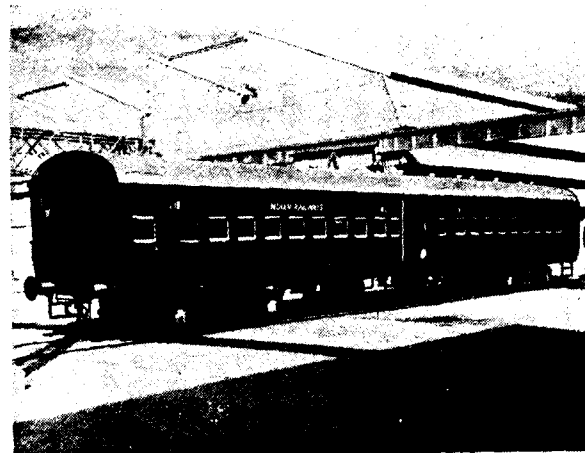




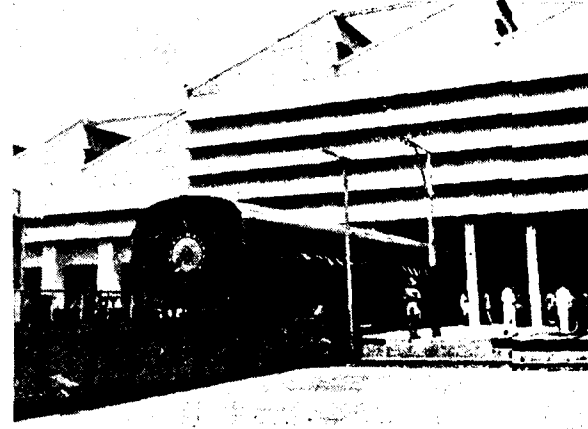
In the final finishing shop before painting the exterior surface of the coach body is thoroughly cleaned by grit blasting.



The interior surface of the coach is sprayed with asbestos to make it heat and sound proof.



The completed coach shell with body and bogies joined together is thereafter made ready for despatch.



The first such coach produced completely at I. C.

movement as the minimum. Method Study therefore aims at reducing the movements to the fastest possible and the least energy consuming.

Again in respect of arm movements the following principles are followed to get the maximum production with least strain on the operator (See Fig. 1).

- (1) Begin and end each movement simultaneously with both hands.
- (2) Use simultaneous arm motions in opposite and symmetrical directions.
- (3) Keep motion path within normal working area.
- (4) Avoid operations above shoulder level.

The feet and legs of an operator can also be used to assist the hands and arms. In a primitive way, the street cobbler adopts this principle and while squatting on the ground holds the job between his feet and uses both his hands for passing the thread through. In a

slightly advanced fashion the shop tailor operates his sewing machine with his feet and frees both his hands for guiding the cloth through the machine. In manufacturing operations similarly it is possible to co-ordinate the movements of the feet with the hands and with a little practice all four limbs can be brought into play either simultaneously or in sequence.

A further aspect that is examined is the posture the operator: the more comfortable it is, the less the fatigue and higher the production. Method Study, therefore, prefers sitting to standing, and upright working to bending. Specialised study has even been made to provide the operator with a seat that is best suited to the operations. It will be seen that in all the above principles, the ultimate aim is comfort to the operator, so that even without imposing any additional strain on him more can be produced.

improved to reduce time and effort of the operator.

In regard to hand tools, it is essential that the most appropriate are used, being neither too large nor too small and being the most efficient in regard to time and effort. The location of tools is also important so that the operator may reach them without strain or loss of time. Where they are heavy they can also be balanced to relieve the operator of the weight.

(5) *Transport*: This is an item, which lends itself to a great economy through method study since its inefficiency is not readily noticeable. Transport may involve movement of materials from one work place to another or at the work spot itself i. e., from the in-tray to the bench or machine table and back to the out-tray.

For studying any particular case, where the materials move from one place to another, a work flow chart is prepared using either string or line diagrams: the work places through which the job

flows are plotted to scale on a paper and the path followed by the job is represented by means of a string or line. A study of the diagram would reveal whether the path is unidirectional, whether there are unnecessary cross movements and whether the path is too long. It may then be possible to re-route the job to other close-by machines so that transport is reduced and economy achieved. In some cases it may even be advantageous to relocate a work place for this purpose, no doubt taking into account all other jobs also which flow through the same work place. When the transport distance of a single item is considerable or the job is heavy it may be economical to set up an exclusive "belt" otherwise termed a 'Product line'. Several such belts have been organised in the Integral Coach Factory (see Fig. 4) based on the work flow charts and considerable economies effected.

In regard

and decreases costs is never a point in doubt, but some hold the view that it is a part of production planning and there is no need for a separate Method Study organisation. In a very general way, this opinion is correct but just as production planning has been separated from Works Management for increasing the efficiency of an organisation, so also should Work Study be separated from Production Planning. This does not mean that the Work Study Department

alone should deal with Method Improvements, but it will be able to bestow full time attention on problems and achieve results through a systematic approach. The Work Study Department will also be responsible for creating method study consciousness amongst all staff, since, the best and quickest improvements can be achieved only if every single individual in the organisation devotes some of his time and thought to Method Improvements.

FINNED TUBE FOR NUCLEAR REACTOR BOILERS

Over 600,000 ft. of welded finned tube made by a new process is to be supplied for use in the boilers of Dungeness Nuclear Power Station, in south-east England.

The process involves welding current generators which are among the most powerful of their type. Cold rolled strip is welded to the tube as it is helically wound on to form the fin. As a result of strict control, a weld bead is produced which is small and consistent in quality and allows more fins per inch. Up to seven fins per inch are accepted as standard,

probably the highest number ever produced in welded fin tubes. The process gives good physical properties and allows tight radius bends.

The size range of the tubes produced will complement an existing finned tube produced by the manufacturers, which is made by a rotary extrusion process and

THE RELATIVE MERITS OF DIESEL AND ELECTRIC TRACTION AND THE PROBLEMS OF CHANGE OVER — A PHASE OF THE RAILWAY TRACTION DEVELOPMENT

By Dott. Ing. Leone Ravenna

of Ercole Marelli & C. S.p.A. Milan - Italy

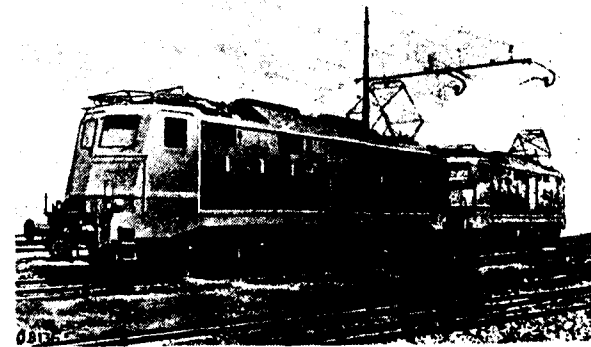
DIESEL Traction was born in Europe—the first Diesel Engine application on rail-vehicles appeared in France in the first years of the 20th century—but developed in America, United States.

During the last years, however, a remarkable impulse in this branch arose also in Europe: something did move, and new solutions were offered by new manufacturers to new buyers.

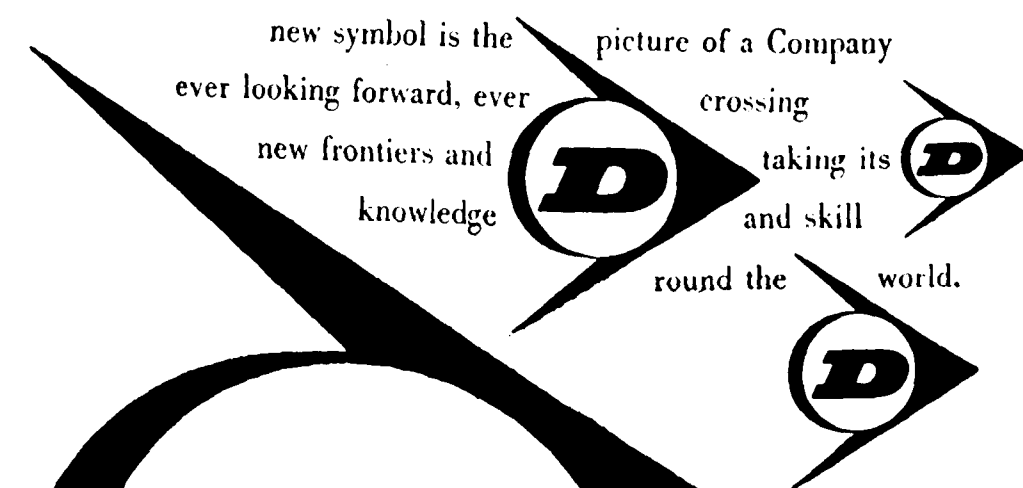
Birth and affirmation of Diesel locomotive were due to a definite exigence, when it was remarked the determining influence the kind of the employed motive power has on the railway operating total expense.

The most proper choice of the locomotive type was taken then in the greatest consideration: a locomotive is to be regarded as an instrument, but, more-

various, but, above all, the initial cost of plans as transmission and distribution lines, substations and overhead system, has always been the main obstacle for new electrifications. Therefore, speaking of new electrifications, the decisive factor has always been the traffic records.



This is the new Dunlop symbol.
A symbol, within its brief compass, should tell
of the spirit of an organisation, of the way
it works and the aims it has set itself. In this



It is the symbol
of a Company
that brings to India
the most advanced
thinking and technique
in the world of rubber.

DUNLOP *the symbol of progress*

DC-547