Sydney Live Steam Locomotive Society
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Newsletter
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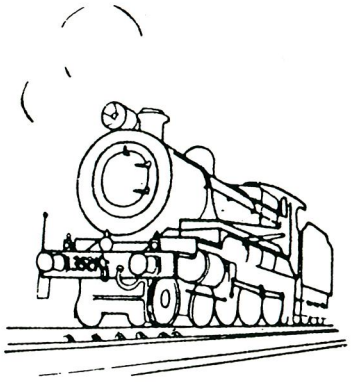


Editorial.

It is a while since the Newsletter has had an Editorial, so I thought the start of a new decade might be the time to include a word or two. At the start of a new year it may also seem strange to talk about something ending, but, with the May Newsletter the valve gear series will come to an end. I know that many members have looked forward to these articles and will no doubt be sorry to see them finish. The member to thank for these articles is Mal McAulay.

I am sure that other members must have information about workshop technique, component plans, etc., that could be reduced, enlarged or redrawn to be included in the Newsletter.

PLEASE see what you have tucked away that could be shared with other members through the Newsletter.

John Lyons

Christmas Celebration.

This was held as usual early in December but saw a change in that we had a B.B.Q lunch followed later by afternoon tea. The day was enjoyed by a large number of members, their children and friends. There were more than the usual number of locomotives in steam for this get together some of which were driven by the,hopefully,future members of the Society. Even the Editors daughter, Catherine, took control of the Z 2552 for one lap, but, do not worry Gentlemen I am sure Catherine will not be applying for membership.

Our thanks should be extended to Diane, Laurelle, Elizabeth and the other ladies who prepared the afternoon tea and ran the canteen for our benefit.

1990 EASTER CONVENTION 1990 EASTER CONVENTION

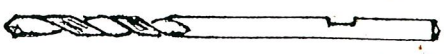
Warner Rd., Warner. (Strathpine) Queensland.

Members wishing to go to the 34th Easter convention should contact our Secretary Alan Mackellar for the Convention Registration Forms.

Workshop Hints.

The drill chucks on our bench or column drills often will not hold very small drill bits because of worn chuck jaws. ALAN MACKELLAR has passed on an idea that will help us out.

On the lathe using a chuck in the tailstock that will take the problem drill, drill a piece of, say, 3/32 " diameter brass rod to a depth not greater than the length of the drill shank. Grind a small flat on the drill shank, slide the drill shank into the hole in the brass rod with the flat upper most and with a flat ended punch, punch down on the brass rod to squash the brass on to the flat on the drill shank. This should now enable you to hold the drill in the problem chuck.



Workshop Hints cont.

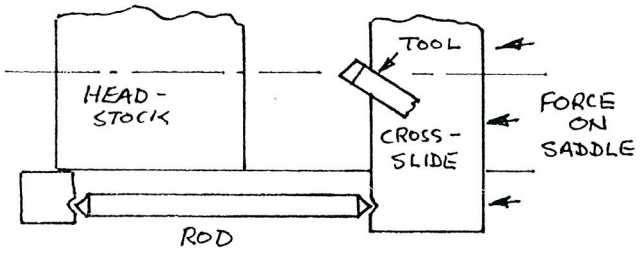
Turning Smoke box doors. Barry Tulloch has related this method to help you take the guess work out of getting the smokebox door machined to the correct radius.

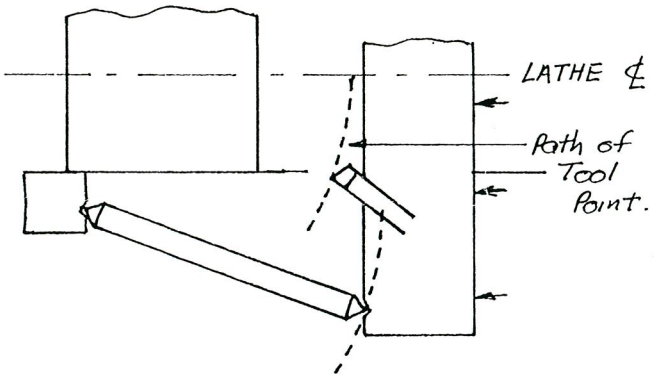
First of all, get a piece of steel rod , say 3/8 " diameter and machine each end to a point. (not too sharp an included angle) It is important that the exact distance between the points is equal to the required radius of the smoke box door.

Now you need a punch mark on the cross slide good enough to locate one of the pointed ends of your rod. The other end of the rod should be located in a similar punch mark on a block fastened to the lathe bed beside the headstock. Some device must now be set up to keep the carriage forced against the pointed rod. Barry uses a large compression spring, when I get round to using this method I think I will use some counter weights connected to the carriage handwheel boss and run it over a pulley at the headstock end of the lathe bench.

The idea is , that when the cross slide is wound out the spring or weights will keep the saddle pushing up so that the rod will stay in place with the point in the punch mark on the cross slide describing an arc equal in radius to the required radius of the smoke box door. The edge of the cutting tool in the tool post WILL ALSO describe the same radius.

I imagine it would be best to start with the pointed rod parallel to the lathe axis and the cutting tool at the centre line of the door. The cutting tool would be adjusted by the compound slide set parallel with the axis of the lathe





New Member.

George Robinson is now a full member of the Society, I hope George, that you have an enjoyable association with the S.L.S.L.S.

Duty Roster.

Mar. '90. B.Peake, W.Allison, J.Murry, J.Leishman, W.Edgecombe, V.Condon.
Apr. '90. T.Arney, G.Farkas, P.Dunn, M.Tyson, H.Ryan, K.Gapes, K.McMahon.
May. '90. W.Richards, T.Geraghty, W.Sandberg, J.Randford, J.Hagan, H.Spencer, A.Cottrell.
June. '90. G.Sharp, B.Kilgour, R.Larkin, J.B.Hurst, C.Wear, T.Collett.

Gate Roster, 1990

March. P.Dunn. April. J.L.Hyde. May. M.McAulay. June. J.Hurst Jnr. July. T.Eyre.

1308

If anyone wanted information about the Z13 of the N.S.W.G.R. the place to go is Parramatta Park. 1308 is currently in the care of the Parramatta Steam Tram Group and is undergoing restoration. About three weeks before this Newsletter the state of work was as follows. The chassis with only cylinders, steam chests and bunker tanks is sitting on blocks in the open at the northern end of the shed complex. All had been cleaned up and was white undercoated. The boiler stands to the east while the side tanks and cab rest under boiler clading and a tree to the west. Wheels etc., are inside the shed. Photos taken at the moment, especially on a cloudy bright day show more detail than usual, you see what is normally lost in shadow. Well worth a visit.

J.L.

52-19 THREE CYLINDER LOCOMOTIVES

Locomotives of the D57 and D58 classes, in addition to the two outside cylinders, incorporate a third cylinder within the frame, the piston of which actuates a central crank pin on the built-up driving axle. On these classes of engine, Walschaert valve gear is employed to control the movement of the valves of the outer cylinders in the usual manner, and the three crank pins are spaced at 120 degrees, or nearly so, in order to ensure a comparatively even torque.

In the earlier designs of three cylinder locomotives, it was the practice to provide each cylinder with independent valve motion gear. In the design of modern locomotives, of this type, the provision of an independent motion gear for the third cylinder has been eliminated. Instead, a simple device has been incorporated whereby the motion gears of the two outer cylinders, by the adjunction of either a system of levers or geared racks, are made to impart the necessary motion to the valve of the centre cylinder.

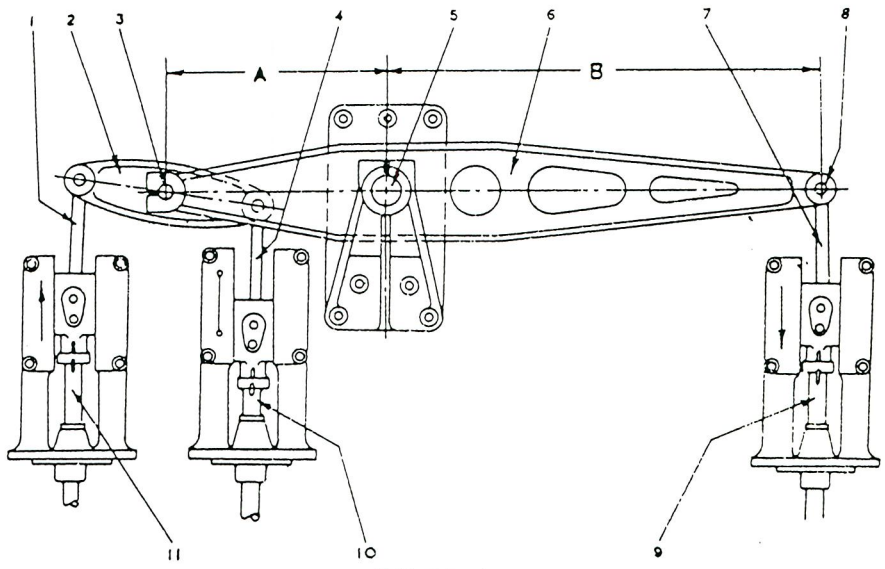


FIG. 52-11.

52-20 THE GRESLEY CONJUGATING GEAR

The arrangement of the Gresley conjugating lever movement, as fitted to D57 class engines, is shown in FIG. 52-11, and in FIG. 30A-4.

In FIG. 52-11 the transverse lever 6 is pivoted at 5 in a fixed fulcrum bracket, the lengths of the arms B and A being in the ratio of 2 : 1. The longer arm B of the lever is coupled to the crosshead on the valve spindle 9 by means of the extension link 7, while the forked arm A carries the floating lever 2. The arms of the floating lever are coupled to the crossheads of the left-hand and centre valve spindles 11 and 10 by means of the extension links 1 and 4 respectively. It will thus be seen that the movement of the centre valve is derived from the combined movements of the right and left hand valve gears.

52-21 PRINCIPLE OF OPERATION

The principle of operation of the Gresley link can be understood by noting the positions occupied by each valve at various stages of the valve cycle; see FIGS. 52-11 to 52-14 inclusive.

In FIG. 52-11, the centre valve spindle 10 has reached the backward limit of its travel. At this stage, spindle 9 has completed about one-third of its backward stroke, while spindle 11 has completed about two-thirds of its forward stroke.

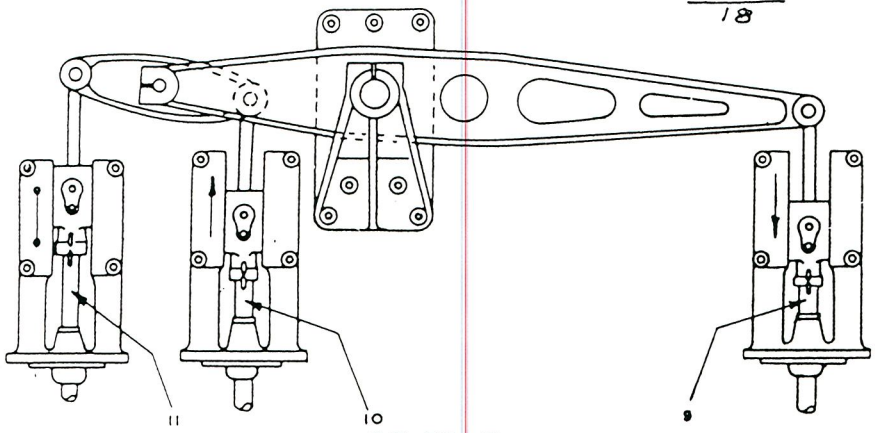


FIG. 52-12.

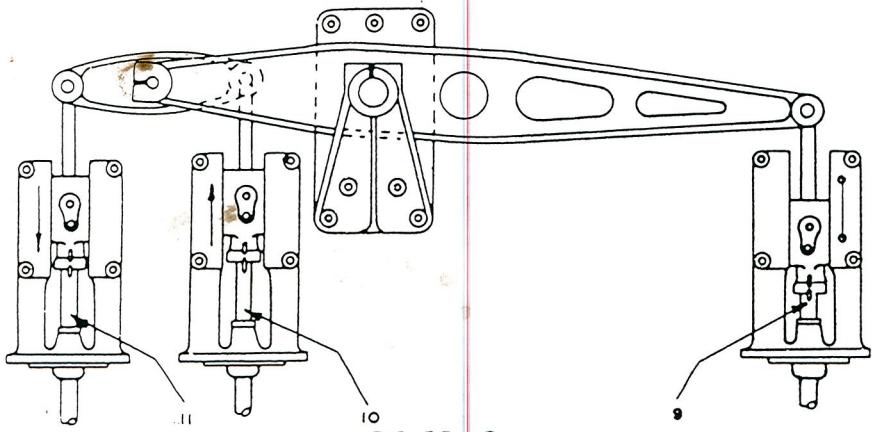


FIG. 52-13.

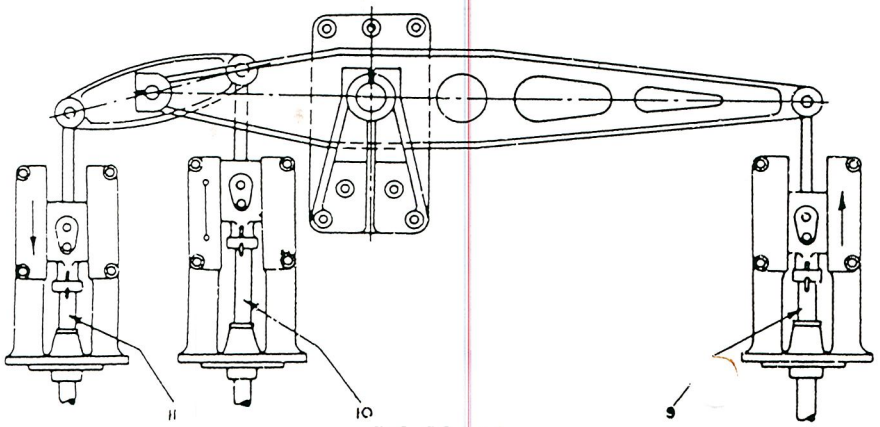


FIG. 52-14.

In FIG. 52-12, valve spindle 11 has reached the forward limit of its travel. At this stage, spindle 9 has completed about two-thirds of its backward stroke, while the centre spindle 10, actuated by the conjugating gear, has completed approximately one-third of its forward stroke.

In FIG. 52-13, valve spindle 9 has reached the backward limit of its stroke, while spindle 11 has moved through approximately one-third of its backward stroke. At this stage, the centre spindle 10 has completed about two-thirds of its forward stroke.

In FIG. 52-14, the centre valve spindle 10 has reached the forward limit of its travel. At this stage, spindle 11 has completed two-thirds of its backward stroke, and spindle 9 about one-third of its forward stroke.

During the remaining half revolution of the crank the cycle will be repeated, but with the valves moving in the opposite direction.

52-22 DISADVANTAGES OF THE GRESLEY MOVEMENT

The Gresley movement, although it gives satisfactory service at speeds suitable for heavy goods traffic, has been found, at high speeds, to cause considerable disturbance in the steam distribution to the centre cylinder.

This error is due, primarily, to the whip and back lash developed in the transverse lever, the effect of which is to cause considerable over-travel of the valve. Moreover, due to the alignment of the cylinders, and to the fact that the pivot pin 3, FIG. 52-11, and the extension link pin 8 of the transverse lever move in arcs of different radii instead of in a straight line, the movement of the centre valve is not correctly synchronised with that of the crank.

Certain modifications in design have been made to offset this latter error, particularly as regards the length of the arms of the floating lever, but these alterations do not correct faults in steam distribution created by whip of the lever.

52-23 CONJUGATING MECHANISM OF D58 CLASS ENGINES

To ensure satisfactory service under all operating conditions, the conjugating mechanism of the D58 class engine has been designed to overcome the disadvantages inherent in the Gresley transverse lever movement.

The arrangement of the mechanism controlling the centre valve of the D58 class engine is shown in FIG. 52-15. This mechanism differs from the Gresley conjugating link in that a rocking shaft is substituted for the large transverse rocking lever.