Method of setting slide valves

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STRATFORD WORKS. METHOD OF SLIDE VALV'E SETTING

To set the valves the slide valve on one side is inserted in its buckle and put into position in the steam chest; then a centre pop is made in the back of the cylinder, into which the point of an angle trammel is placed, the other bent up end of the trammel being used to mark the valve spindle. The valve is now moved in the steam chest until the front port is just closed by it, and the spindle is marked by the trammel at this point, a small centre pop being made. This point represents the point of cut off for this port; the valve and buckle are next drawn along until the back port is just closed by the valve; another mark on the valve spindle will represent the point of cut off for this port. Ihe other valve and spindle are treated in a similar way, and the four points of cut off obtained and marked.

The steam chest cover may then be put on temporarily, the intermediate valve spindle coupled up to the buckle stem, and if not already done, the eccentric rods coupled up from the eccentric straps to the quadrant links. The reversing rod connecting the controlling gear in the cab with the arm upon the reversing shalt is next put in place and the lever put over into full fore gear The driving wheels of the engine are lifted and placed on rollers which driven by either an electric motor or by manual means. The wheels are then turned at least one revolution, the engine remaining stationary. The distance between the top of the quadrant block and inside of the link is measured to obtain the lowest point reached. When the driving wheels have made a complete revolution in this direction, reverse the lever into full back gear and move the engine backwards, measuring the distance between the bottom of the quadrant block and the top of the inside of the quadrant link, if the minimum distance here is not the same as on the top of the quadrant block in forward gear, the reversing rod is not of the correct length. If the arm upon the shaft to which the rod is coupled is below the shaft, and the distance between the top of the block and link in fore gear is greater than the distance between the bottom of the block and link in back gear, the reversing rod is too long and does not allow the quadrant link to be lowered sufficiently, if the opposite is the case the rod is too short and pulls the quadrant link too far down.

When however the arm upon the shaft is above the shaft, the exactly opposite effect will be produced on the link if the rod is long or short. The correct length of the rod should give a little more clearance above the quadrant block than below it, as all wear, etc., on the motion will tend to allow the whole to fall and not to rise in working.

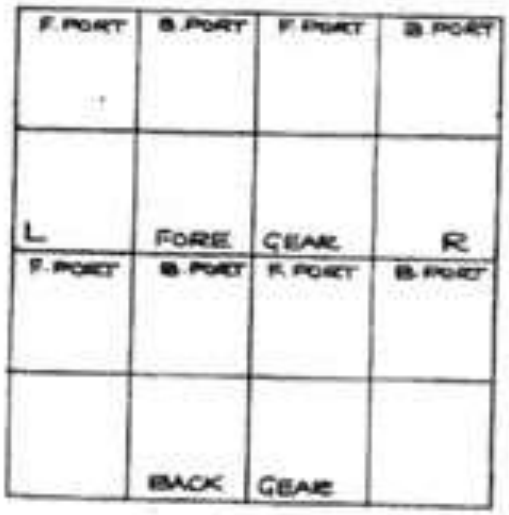
The reversing rod having been attended to, the eccentric rods are adjusted, this is usually done with the gear in the average running position, that is, cutting off at about 30 per cent of the stroke, or if a lever is used with the sector plate graduated in percentages in about the second or third notch. First, black the spindle near the centre pops representing the cutting off points for each port; put one end of the same trammel that the pops were originally put in to, in the pop in the back of the cylinder, put the lever into the fore gear running position and move the engine slowly forwards,

observe which port is opening, and mark with the trammel upon it as the maximum opening is being made, then as the valve commences to close, leave this port and mark the next, and so on for the four ports. The exact amount that each port opens will thus be marked upon the valve spindle. A plate marked off in four divisions is required as at A. Measure with dividers the distance from the centre pop representing the front port on the L-H. side and scribe a semi-circle upon the plate. Do the same for the back port, carrying the mark round sufficiently far to allow for the distance between them being measured. Now mark off the R.H. ports in the same way, Next, black over the marks upon the valve spindle, reverse the engine into back running position and proceed as before. marking the valve spindle and from that the plate for the back going position. The eccentric rods should next be adjusted until the openings for the front and back ports are correct. In practice it is usual to allow the rods to be a little short, from 1/32 to 1/16of an inch, and the front ports. therefore, will be opened more than the back pods. This is to allow for the valve being pushed forward when the spindles. etc, become heated and the engine settles down on the springs, the; valves working forward a little, especially when the cylinders are inclined.

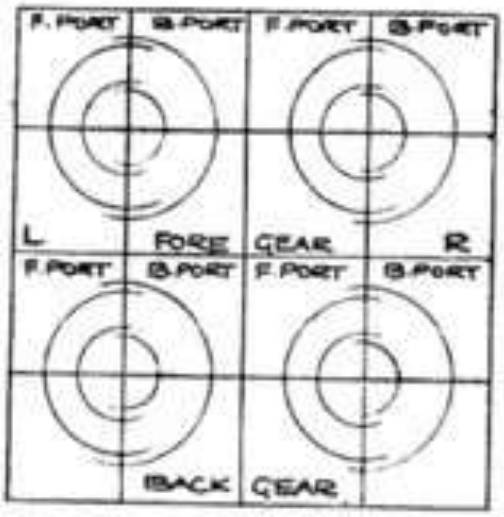
The plate will now be marked as in B. It will often be necessary to adjust the rods more than once before the correct result is obtained, but from the marks made on the plate any irregularities in length can be detected. Put the lever into full forward gear. moving the engine forward and mark the spindle as before, this will give the maximum opening of ports, mark the plate again, reverse the engine into full back gear, and move backwards to obtain full opening of ports for back gear, and mark the se also on the plate, which will now be marked as at C. The eccentric rods being now of the correct length, the lead is tried over. The connecting rods are put up, but previous to coupling them to the crossheads, the pistons, with rods and crossheads attached, must be pushed to the extreme end positions, with the covers off the cylinders and the slide bars marked at these points. The connecting rods should next be coupled up and tried over to see how much clearance there is between the extreme positions assumed by the pistons when coupled up, and that, when they are free, the distance between the two called the "clearance" is generally from 1/4" to 3/8".

To get the exact point at which the crosshead stops, or the "dead centre" of the crank" it is necessary to observe other parts than the crosshead alone. Put a small pop on the slide bars about 1/2" outside the "bump" or extreme position of the piston when coupled to the connected rod, and open a pair of dividers about 1/2" and as the crosshead approaches the end of the stroke, stop the engine and mark the crosshead with an arc, also mark the side of the tyre upon some convenient part. now moving the engine along the crosshead will pass the dead centre and commence to return, as the same arc is again reached, stop and mark the tyre here also. as we have two marks on the tyre equally distant one on either side of the actual dead centre, if this distance is equally divided the centre will be the-dead centre, this is done and the engine moved until the mark on the tyre midway between the first two occupies the same position as they did when they were made, and the crosshead is exactly at its dead centre, if now a mark is made on the slide bar" the distance between it and the bump will be the clearance. When all these dead points have been made, the lead can be obtained by setting the crosshead upon one of them and measuring the port opening at the same end and side of the engine with the lever in full gear, as then the lead is least. The plate is marked with these dimensions and will then be as shown at D. If it is necessary to alter the lead this can be done by' shifting the sheaves round on the axle alr1 refitting them with keys in their new position; if the lead requires increasing move the sheaf.

VALVE SETTING PLATE

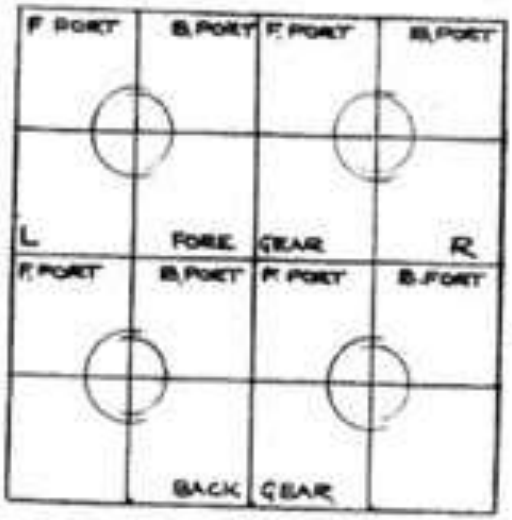


A

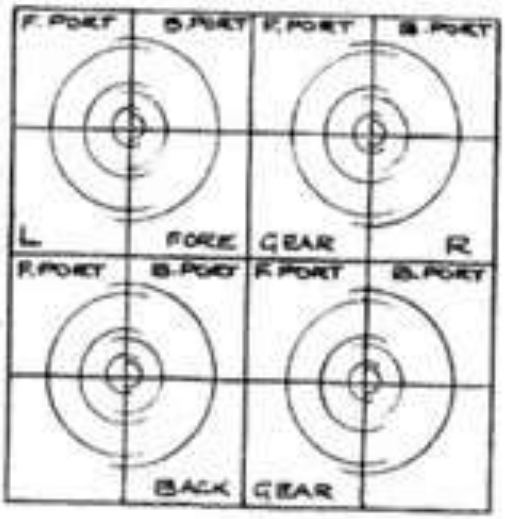


C

NOTE. PLATE NORMALLY CUT OF BRASS (6"x6") WITH LETTERING HARD STAMPED WITH VERTICAL AND HORIZONTAL LINE SCORED INTO SURFACE. AT STRATFORD, PLATE BLACKENED WITH PARAFIN LAMP FLAME SMOKE BEFORE SCRIBING SEMI CIRCLES



B



D