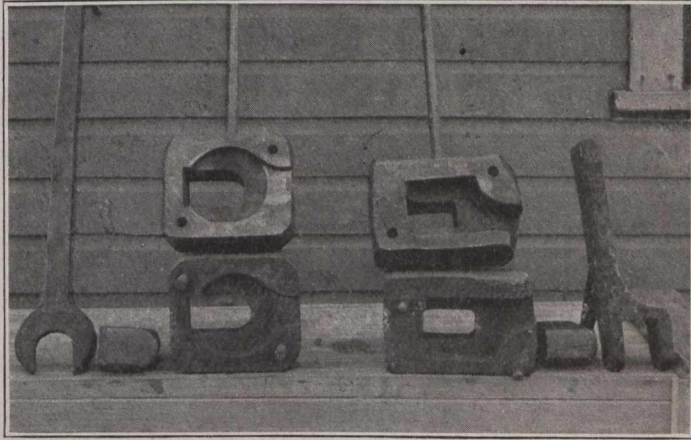


Steam Hammer Forgings at Grand Trunk Pacific Railway Shops.

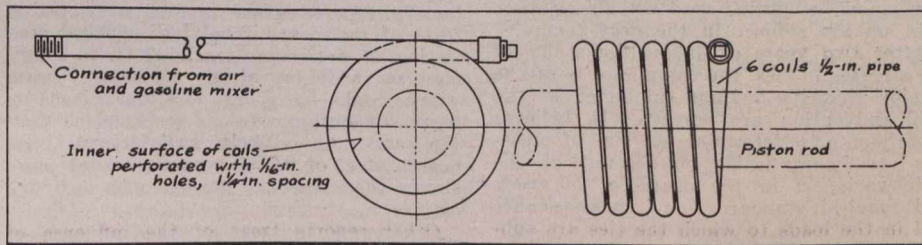
The lack of a forging machine at the G.T.P.R. old shops at Rivers, Man., made necessary the development of alternative methods of producing work that would ordinarily be done in the forging machine. For most of the work, the steam hammer has been found to be useful, and by various means the work is now being produced through its use. Some small shops are still called upon to do the work in the same way, but such shops are becoming fewer every year.

In the accompanying illustration are



Steam Hammer Forgings and Dies at G.T.P.R. Rivers Shops.

shown completed a spanner and the forked end of an eccentric rod, with the dies and tools used in their production. In both instances, bar stock is drawn down under the steam hammer to roughly the required shape, and formed to final outside shape in the dies shown, the upper die being guided down over the lower one on the two guiding pins. On the outside shape of the pieces being formed in the dies, that is, when the two parts are brought down flush, the flash forming in the upper and lower holes, shearing pins, shown alongside the dies, the shape of these holes are placed therein, and driven through under the steam hammer, forming the openings in the ends as in the spanner and rod ends.



Heater for Use in Bending Piston Rods Without Removal from the Lathe.

A smooth and perfect job results, equal in quality with the forging machine work, but of course, at a much slower rate of production.

The company's repair shops are now located in the new buildings at Transcona, Man., and in consequence, the foregoing method of production has been superseded by more modern means.

In its final report to the U.S. Interstate Commerce Commission, the Block Signal and Train Control Board made the recommendation that all interstate railways should be compelled to adopt the block signal system. The Board also recommended that tracks be inclosed and laws against trespassing be enforced.

Heater for Bending Piston Rods at Grand Trunk Railway Stratford Shops.

At the G.T.R. locomotive shops at Stratford, Ont., piston rods that after forging are found to be eccentric to a degree that would be inadvisable to attempt to bend cold, are straightened without removal from the lathe. Usually it is necessary to remove the rod to a forge fire, heat and bend back to shape, and then return to the lathe. Straightening them in the lathe, when set up for machining, effects a considerable saving in time, from the fact that it is there that the rods are found to be out of true, so that the error is rem-

edied without removal from that spot.

The heater employed for the purpose is shown in the accompanying illustration. It consists of six turns of $\frac{1}{2}$ in. wrought iron pipe, coiled, to give an internal diameter of $4\frac{1}{2}$ ins. One end of the pipe is made blind with a pipe plug, and the other end has a tangential section about 3 ft. long, to which a connection is made to a portable air and gasoline mixing tank that is commonly to be found around locomotive shops. Radially inward from the inner surface of the coiled pipe, there is a series of 1-16 in. holes at a $1\frac{1}{4}$ in. spacing, through which the inflammable vapor impinges on the rod, burning with an intense heat, all the small jets of flame being di-

rected towards the centre.

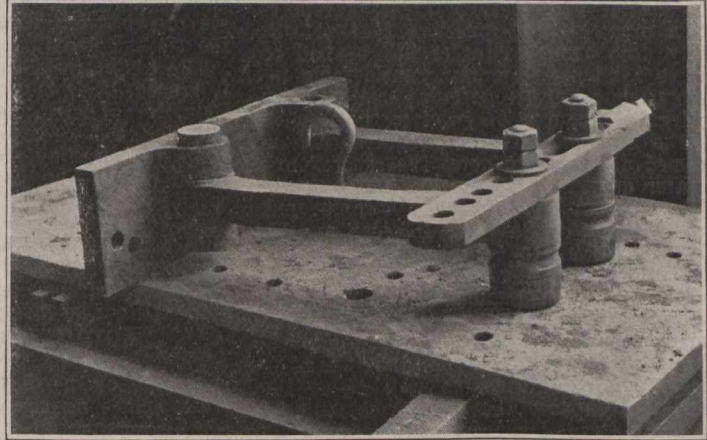
The burner, connected by a rubber hose to the supply tank, is slipped over the end of the piston rod in the lathe, and located over the point to be bent. The heat is so intense that a very short time suffices to heat the rod to a bending heat, when it is a simple matter to rectify the error without removing the rod from the centres, or straining the lathe, as might happen if an attempt was made to bend cold between centres.

By means of exhaust fans for the drawing off of fine dust from grinding rooms, the polishing of metals has now become a much more healthful and agreeable business than formerly.

Bulldozer Forming Die at Canadian Pacific Railway Winnipeg Shops.

A handy form of die for attachment to the movable bulldozer head is in use in the C.P.R. shops at Winnipeg. There is a wide range of bending operations performed on the bulldozer in which the whole operation consists simply in bending the two projecting ends of a bar around a stationary block or pin, such, for example, as the various sizes of coupler yokes, eye bolts, and other similar parts. The conventional practice is to make a male and female die for each such part.

With the die as made in these shops, the



Adjustable Bulldozer Forming Die.

one female die may be used with a large number of male dies, reducing the stock of dies required, this being accomplished in a very simple manner, as the accompanying illustration indicates. Instead of the two arms of the female die being solid, with the usual rollers on the outer ends, the two arms are still retained, but are attached to the base of the die by a pin connection in such a manner as to be free to swing on that pin connection. The outer ends of these pinned arms are held in a fixed relation to each other by a cross member, consisting of a piece of flat stock, drilled with spaced holes, and a bolt slot. By bolts in the ends of the arms above the rollers, the rollers are set in any fixed relation to each other, for forming any size of stock around a given mandrel. The nearer roller cannot slip in the holes, but in the slot, the far bolt might be liable to do so if the friction of the bolt and nut were alone depended on. In consequence, there is a set screw in the other end of the cross piece, locating the roller on that side without danger from slippage.

The whole adjustable die is attached to the face of the bulldozer ram. While it would be possible to operate on heavy stock with such a die, it is used for the most part only on lighter stock.

The problem of keeping superheater tubes clean has been solved on one U.S. road, where the flue cleaners are supplied with pocket flash lamps which enable them to see the whole length of the tube, and thus determine whether they are doing effective work.

In order that the mining and transportation of ore might progress even in the coldest weather, the railway ore cars of an Alaska mining company are provided with false bottoms, containing heating pipes, through which steam is passed from boilers at the bunkers. This thaws the ore, and it is said no difficulty has been experienced in handling the ore even at 50 degrees below.