ABSTRACT: A portable swaging machine for swaging holes in laid railway rails, comprising as a rigid structure a hydraulic hand pump to which is connected a control and a hydraulic jack, the jack ram having its outer end adapted for fitment of a swaging tool, a releasable fastening device in the form of a U-frame releasably pivoted to the rigid structure and adapted for fitting about a rail in looplike manner, there being optionally provided a centering plunger for engaging the rear of the hole, a spacer for use with a bull head rail, adjustment means for holes at different levels, and skid or wheel means under the machine.
RAIL HOLE SWAGING MACHINE

CROSS REFERENCES TO RELATED APPLICATIONS


This invention relates to an improved rail hole swaging machine. In the established practice of joining two aligned ends of railway rails by a fishplate and four bolts, the bolt holes have been formed by drilling, and after a period of use the movements which occur relatively between the rail ends have led to cracks forming in the metal around the holes. The holes are drilled by a fixed drilling machine in a workshop i.e. before the rails are laid in use, and for ensuring that cracks do not appear after a period of use, a practice has been adopted of increasing the size of the holes to a specified extent by a swaging operation following the drilling operation in the workshop, and this increases the hardness of the metal locally by work hardening.

In some instances rails have been drilled in the workshop and then laid in position for use without the holes being swaged, and an object of the invention is to enable swaging of the holes to be thereafter effected on the laid rails by a swaging machine which is of such portable or mobile construction as to be readily taken to and from the laid rails, applied thereto, and then operated to effect the swaging.

The invention provides a portable swaging machine for swaging holes in laid railway rails, comprising as a rigid structure a hydraulic hand pump to which is connected a control valve and a hydraulic jack, the jack ram having its outer end provided as a swaging tool, a releasable fastening device adapted for releasable attachment of the rigid structure to a railway rail, and abutment means to bear against the rail and take the thrust of the swaging action as the jack applies the swaging tool to a rail hole by operation of the pump. Conveniently the releasable fastening device is the U-frame releasably pivoted to the rigid structure and adapted for fitting about a rail in loop-like manner. Conveniently also the swaging tool is of a form for ready fitment to and removal from the ram. The ram may be also provided a centering plunger for engaging the rear of the hole to be swaged from the front thereof. There may be provided at least one spacer adapting the machine for use with a bull head rail. Adjustment means are conveniently provided to adjust the machine for use on different holes at different levels. Skid or wheel means may be provided enabling the machine to be readily pushed or pulled along the rails.

The above and other features of the invention set out in the appended claims are incorporated in the construction which will now be described, as a specific embodiment with reference to the accompanying drawings in which:

FIG. 1 is a diagrammatic side view of a portable rail hole swaging machine according to the invention.
FIG. 2 is a plan view of a modified construction.
FIG. 3 is a side view of FIG. 2.

Referring to FIG. 1 of the drawings, the machine comprises, as a rigid structure, a hydraulic hand pump 1 with pump handle 2 and incorporating a tank release valve 3, a 3-way hydraulic selector valve 4, and a double acting hydraulic jack 5. Conveniently the 3-way selector valve 4 is mounted on the pump 1 and is hydraulically connected thereto by hydraulic pipes 6 and 7.

The hydraulic jack comprises a cylinder 5a and a ram 5b and on the outer end of the ram 5b is provided, in removable manner, a swaging tool 8.

Secured to the pump 1 is a U-bracket 9 having aligned holes in its arms for pivot bolts such as 10. Mounted on the pivot bolts such as 10, are U-shaped frames such as 11 the free ends of the arms such as 11a, 11b of which have aligned holes to receive the pivot bolts such as 10 by which the frame is pivotally connected to the bracket 9, and the crossbars such as 11e of which have an upper inside corner abutment 11f of smaller size than the abutment 11f.

Secured to the crossbars such as 11e is a spring biased plunger 12 having an inner head 12a formed with a conical end 12b, a spring 13 biasing the plunger head 12a towards the swaging tool 8 with which it is in axial alignment on the longitudinal axis of the frame 11.

In use of the machine it can be taken to and from railway rails when laid in position for use.

The machine is required to be used in swaging already drilled holes in aligned ends of two rails, which holes are for the purpose of the attachment of a fishplate by bolts.

For fitting the machine in position, the pivot bolts such as 10 are first removed and then the frames such as 11 are fitted round the rail such as indicated at 14 in the drawing.

Next the pivot bolts such as 10 are refitted to attach the pump, valves and hydraulic jack to the frames such as 11.

The disposition of the frames such as 11 is such that the abutment 11f bears against the rear side of the upper flange of the rail 14 and the smaller abutment 11g bears against the rear side of the lower flange.

In addition the plunger head 12a is engaged with a drilled hole such as 15 in the rail so that the swaging tool 8 is directly opposite the front of the hole 15 which is to be swaged.

Then the valve 4 is set for extension of the hydraulic jack 5, and the pump handle 2 is operated to cause extension of the jack 5 so that the swaging tool 8 is projected first into engagement with and then through the hole 15, during which the swaging tool 8 pushes the plunger 12 rearwardly away from the rail 14. By this means the hole 15 is swaged in the desired manner.

After the swaging operation the swaging tool 8 is released from the ram 5b by the jack 5 being contracted by first setting the valve 4 and again operating the pump handle 1.

Thereafter the swaging tool 8 is refitted to the ram 5b, and the machine is slidably displaced along the rail 15 to a position where it can be operated on another hole, in repeat as many times as required.

At any time required the pivot bolt 10 is removed to allow removal of the frames such as 11 from the rail 14 and the frame is reconnect ed by the pivot bolts such as 10 to the pump 4 ready for further use at any other required location to which the machine may be readily taken.

The machine may be fitted with a spacer, e.g. spacer 11a illustrated in phantom, suitable to enable use of the machine on British Standard bull head railway rail; B.S. Section No. 955, illustrated in phantom at 14 the machine being otherwise constructed for use on British Standard railway rails, B.S. 11-1959, Section No. 1110A.

Adjustment means, e.g. different thickness washers 11i and 11j interchangeable fitted between the brackets 9 and the arms 11a and 11b, and adjusting screw means 12c for the plunger 12, may also be provided whereby the machine can be adjusted upwardly or downwardly for use on holes in a rail at different levels. For example, hole 15a shown in phantom spaced slightly below hole 15.

There may further be provided a skid 1a for example incorporating a low friction plastic medium, or wheels 1b, which may be fitted to the base of the reservoir tank of the hand pump 1, thus providing for the machine 1 to be readily pushed or pulled for example along a railway rail, the machine being lifted onto the rail with the skid 1a or wheel 1b bearing on the rail using the outer end of the U-shaped frame 11 as a handle.

FIGS. 2 and 3 show another model of the device which is constructed and used in substantially the same manner as the model of FIG. 1. Consequently in FIGS. 2 and 3, like reference numerals for like parts of FIG. 1 are raised to the first degree. The only difference from FIG. 1 are that the plunger 12, 12a, 13 is not incorporated, pipelines between the valve 4 and the ram cylinder 5a are indicated at 16, 17, and FIG. 2 also shows that there are two U-shaped frame member 11', 111 with pivot bolts 10', 100' one frame and bolt on each side of the cylinder and ram 5'.
1 claim:

1. A portable swaging machine for swaging holes in laid railway rails, comprising as a rigid structure a hydraulic hand pump to which is connected a control valve and a hydraulic jack, the jack ram having its outer end provided as a swaging tool, a releasable fastening device adapted for releasable attachment of the rigid structure to a railway rail, and abutment means to bear against the rail and take the thrust of the swaging action as the jack applies the swaging tool to a rail hole by operation of the pump.

2. A machine according to claim 1 wherein the releasable fastening device is a U-frame releasably pivoted to the rigid structure and adapted for fitting about a rail in looplike manner.

3. A machine according to claim 1 wherein the swaging tool is of a form for ready fitment to and removal from the ram.

4. A machine according to claim 1 having a centering plunger for engaging the rear of the hole to be swaged from the front thereof.

5. A machine according to claim 1 having at least one spacer adapting the machine for use with a bull head rail.

6. A machine according to claim 1 having adjustment means to adjust the machine for use on different holes at different levels.

7. A machine according to claim 1 having skid means enabling the machine to be readily pushed or pulled along the rails.