(No Model.) 2 Sheets—Sheet 1.

E. HEYDE.

RIVETING MACHINE.

No. 493,928. Patented Mar. 21, 1893.

Fig. 1.

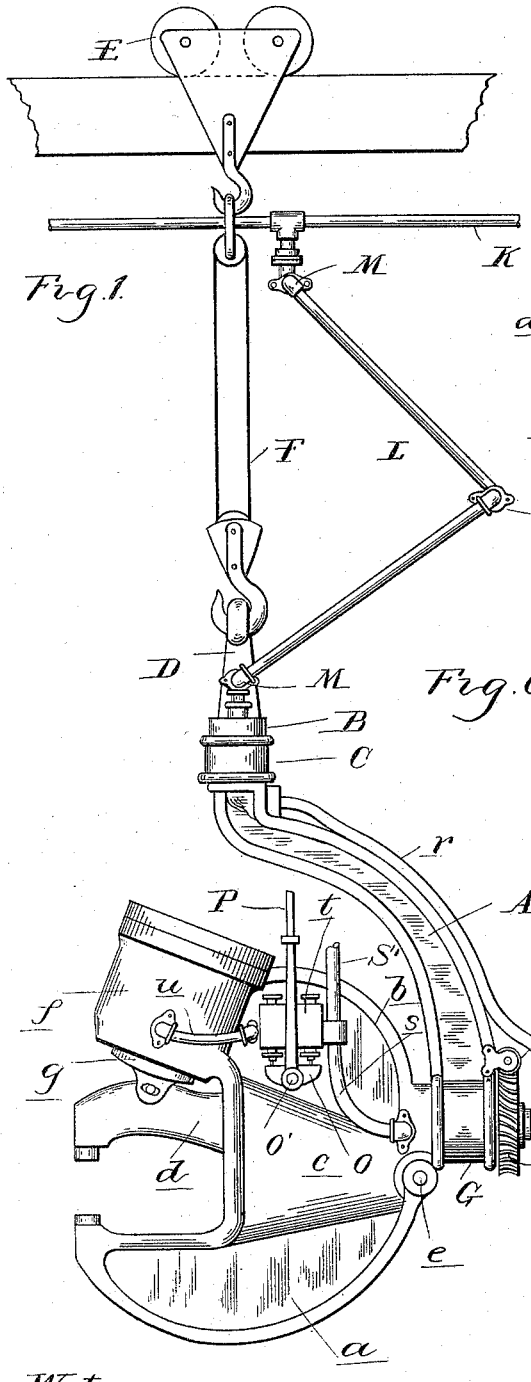


Fig. 5.

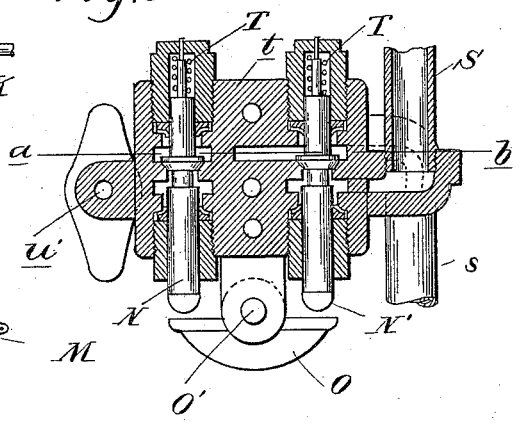
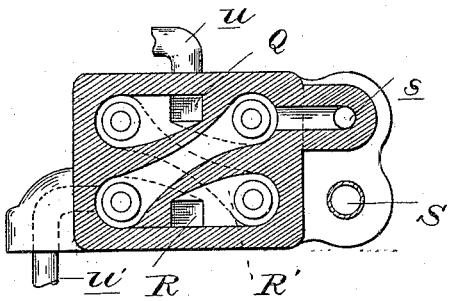


Fig. 6.



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N. L. Lindop

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(No Model.) 2 Sheets—Sheet 2.

E. HEYDE.

RIVETING MACHINE.

No. 493,928. Patented Mar. 21, 1893.

Fig. 2.

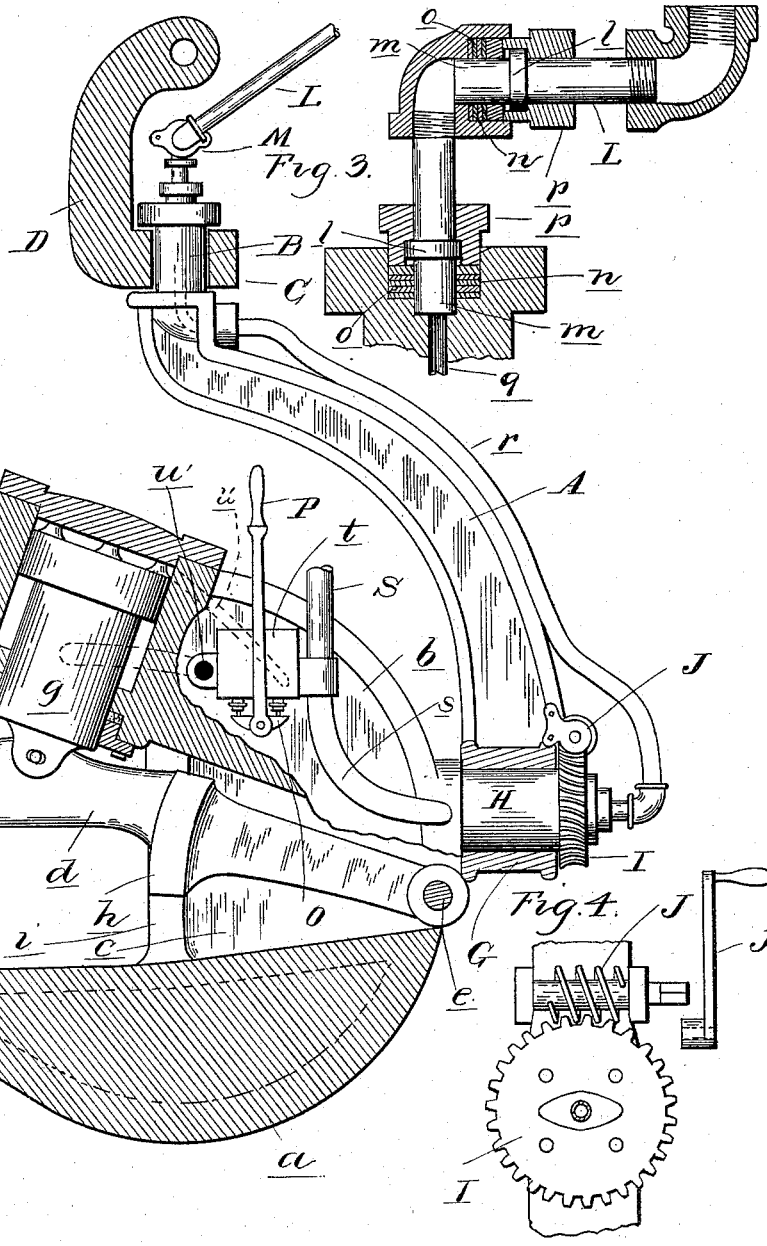

Fig. 3.

Fig. 4.

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UNITED STATES PATENT OFFICE.

EDWARD HEYDE, OF SAGINAW, MICHIGAN, ASSIGNOR TO WICKES BROTHERS, OF SAME PLACE.

RIVETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,928, dated March 21, 1893.

Application filed April 15, 1892. Serial No. 429,332. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HEYDE, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Hydraulic Riveting-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in hydraulic riveting machines, and the invention consists in the construction of the frame of the riveter in substantially U-shape or C-shape, that is the two arms connect at one end, one arm forming the stationary jaw of the riveting machine, the other arm carrying a hydraulic cylinder, with a piston therein, and the movable jaw of the riveter connected thereto and pivoted between the two arms of the frame.

The invention further consists in the peculiar construction and arrangement of the cylinder, whereby its power is more directly applied to the work and without interfering with the handling of the work to and from the jaws.

In the drawings, Figure 1 is a side elevation of my improved riveter. Fig. 2 is a vertical, central section therethrough partly in elevation. Fig. 3 is an enlarged section through one of the swiveled joints. Fig. 4 is an elevation of the worm gear for turning the riveter. Fig. 5 is a vertical section through the valve chest, and Fig. 6 is a cross section thereof on line *a b*.

A is the curved suspending arm having the bearing B at the top journaled in the eye C of the suspending link D which is suspended from any suitable device—I have shown it suspended from the over-head truck E by means of chain block F, so that it may be raised or lowered. The curved arm A at its lower end is provided with the circular bearing G in which the trunnion H of the riveter is journaled, a worm gear wheel I being secured at the outer end of the trunnion acting as a collar to hold the frame in position, and the worm J engages therewith having a suitable crank handle J′ for rotating the riveter into any desired position. The riveter frame is of substantially U or C-shape and consists of the arm *a*, which forms the stationary jaw of the riveter and the arm *b*, the two being connected by the separated webs *c* forming between them a chamber, at the rear end of which is journaled the movable jaw *d* upon the trunnion *e*. This frame is provided with a trunnion H, previously referred to and is adjusted as described. The arm *b* at its outer end is provided with the obliquely arranged cylinder *f*, in which is the piston *g* which is pivotally connected to the movable jaw *d* for actuating the same.

It is evident from the parts thus described that the riveter and its frame may be turned in a horizontal plane from the suspending link D and that the riveter frame itself may be turned in a vertical plane upon the trunnion H. The movable jaw and the outer end of the stationary jaw project slightly beyond the arm *b* of the frame and this in connection with the oblique arrangement of the cylinder *f* gives me plenty of room for handling and moving the work in front of the jaws, and yet enables me to get the hydraulic piston applied to the movable jaw in close proximity to its outer end. The movable jaw *d* is preferably provided with a segmental flange *h* guided between the guides *i*, formed at the forward end of the connecting webs *c*.

j is the die in the movable jaw and *k* is the die in the stationary jaw. These may be of any desired shape and size.

K is the main supply pipe for the motive fluid.

L is the connecting pipe between the pipe K and the riveter frame, this pipe being in sections connected by swiveled joints M. These swiveled joints are preferably formed, as shown in Fig. 3, the pipe being provided with a collar *l* and the nipple *m* beyond the collar. A recess *n* is formed in the elbow or connecting pipe and packing *o* is placed therein around the nipple *m* and a suitable packing gland *p* recessed to receive the collar *l* is secured into the outer end of the recess *n*. A pair of these swiveled joints, arranged, as shown in Fig. 3, will make a simple and universal joint. The pipes L connect with the passage-way *q* in the bearing B which connects into a pipe *r* extending down beside the arm A to a point opposite the center of the

trunnion H and connects with a central passage therethrough which communicates with a pipe *s* at the side of the frame connected into the valve chest *t*.

u is a passage way leading from the valve chest to the top of the cylinder and *u'* is a passage way leading from the valve chest to the bottom of the cylinder.

N N' are two sets of valvestems two in each set, having suitable valves to control the ports through the valve chest.

O is an actuating arm on the shaft O' for actuating either set of valves. P is a lever for rocking this shaft. When the lever is turned to actuate the valve stems N', the water under pressure from any suitable source will pass through the connections described into the inlet pipes *s* through the port Q, shown in Fig. 6 and into the passage way *u* to the top of the piston forcing the piston down. The water beneath the piston will pass through the passage way *u'* into the port R and out through the discharge pipe S. Reversing the position of the lever P will allow the springs T to close the valves on the stems N' and at the same time open the valves on the stems N causing the motive agent to pass through the port R and passage way *u'* beneath the cylinder, while the water above the cylinder will find exit through the passage way *u*, port R' and discharge pipe S.

What I claim as my invention is—

1. In a portable hydraulic riveting machine, the combination with a frame consisting of two jaws rigidly connected, a cylinder formed in the outer end of one jaw a piston in the cylinder, a die on the opposite jaw, of a movable riveting jaw pivoted between the said other jaws, a pivotal connection directly between the piston and movable jaw, and means on the frame for governing the movement of the liquid to and from the cylinder, substantially as described.

2. In a portable riveter, a frame composed of two arms, and separated webs rigidly connecting the arms at one end, a die at the outer end of one arm, a movable jaw pivoted between the webs and guided thereby, a cylinder in the other arm and a piston therein, connected to the movable jaw, substantially as described.

3. In a portable riveter, a frame composed of two arms rigidly connected at one end by two separated webs, a lever pivoted between and guided thereby, and forming the movable jaw of the riveter, an obliquely arranged hydraulic cylinder at the end of one arm, a piston therein, a pivoted connection between the piston and movable jaw, and a die on the end of the other arm, substantially as described.

4. In a portable riveter, the combination of a C-shaped frame, one end carrying the stationary die and the other carrying an obliquely arranged cylinder and a piston therein, and a movable die actuated by and pivotally connected with the piston, having a rearwardly extending support pivotally connected to the frame, substantially as described.

5. In a portable riveter, the combination of a C shaped frame, having integral arms of different length, a stationary die at the end of the longer arm, an obliquely arranged cylinder at the end of the shorter arm, a movable jaw pivoted centrally of the frame and extending between the arms, and a piston in the cylinder connected to the movable jaw intermediate its ends, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD HEYDE.

Witnesses:
H. T. WICKES,
ALFRED HUDSON.