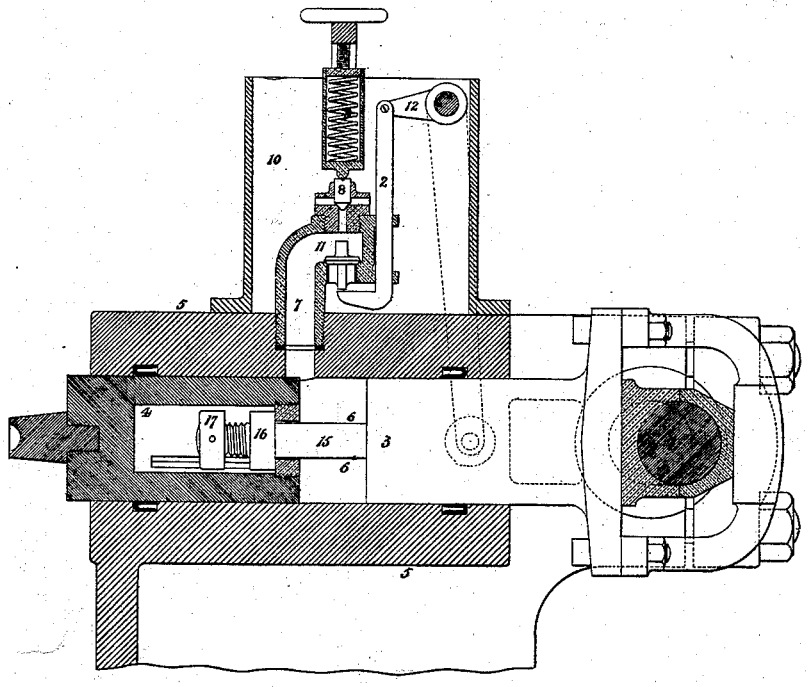
H. MacCOLL.
Riveting-Machine.

No. 207,049. Patented Aug. 13, 1878.



Witnesses,
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UNITED STATES PATENT OFFICE.

HECTOR MACCOLL, OF GLASGOW, SCOTLAND.

IMPROVEMENT IN RIVETING-MACHINES.

Specification forming part of Letters Patent No. **207,049**, dated August 13, 1878; application filed January 25, 1878; patented in England, May 2, 1876.

To all whom it may concern:

Be it known that I, HECTOR MACCOLL, of Glasgow, in the county of Lanark, Scotland, have invented certain new and useful Improvements in Riveting-Machines, of which the following is a specification:

My invention relates to certain improvements in riveting-machines or presses driven by a positive motion, and in which a liquid is interposed between two parts of the ram which operates the die. The said liquid has access to a loaded escape-valve, so that, as long as the strain transmitted to the die does not exceed a degree proportionate to the load on the valve, the liquid confined in the space between the two parts of the ram simply acts as a solid part of the said ram, but, on such strain being exceeded, a part of the liquid passes through the loaded valve and allows the gearing or mechanism to complete the stroke without further increasing the strain.

The object of my invention is to so construct a machine of this character that the ram carrying the die may have a positive inward motion, and that the operation of the loaded valve may be rendered more efficient.

This object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawing, the figure in which represents a vertical section of my improved riveting-machine.

In the drawing, a transverse horizontal crank-shaft, 1, made to rotate in any convenient way, imparts a horizontal reciprocating movement to a ram which is in two parts, 3 4, made in this example of malleable iron and turned to fit and work through a bore in a massive part, 5, of the main-frame casting.

The bore in the part 5 serves as a guide for the ram 3 4, and is fitted with cup-leathers on each side of a middle space, a part, 6, of which between the two parts 3 and 4 of the ram is filled with liquid. This liquid is in communication, by a passage, 7, with a valve, 8, which is loaded by a spring, 9, (or it might be by a weighted lever or direct weight,) and which is situated in a cistern, 10, and when the ram 3 4 is subjected to a strain exceeding what corresponds to the load on the valve 8, this valve opens and allows some liquid to pass out into the cistern 10 from the space 6 between the two parts of the ram.

On the return inward of the ram any liquid which has been forced out passes back to the space 6, through an inlet-valve, 11, provided for the purpose, and opened by a toe-rod, 2, jointed to a lever, 12, which is on a spindle passing through the side of the cistern, an arm on the outer end of the spindle, and indicated by dotted lines, being acted on by a cam-piece on the crank-shaft 1. As this valve 11 has a positive motion imparted to it on the return stroke of the ram, the water which may have been forced out is readily readmitted without requiring the lifting of the valve to depend on the action of the ram.

The passage 7 communicates with the upper part of the space 6, so that any air which may accidentally have entered this space may readily escape.

The full backward travel of the outer part, 4, of the ram is insured by means of a bolt, 15, screwed into the part 3 acted on by the crank, and projecting into a bore in the outer part, 4.

A nut, 16, is screwed on the bolt, and, when moving back, bears against a ring screwed into the mouth of the bore, so that one part, 3, of the ram pulls back the other part, 4, as soon as the space 6 has refilled to the proper extent with liquid.

A feather formed on the nut 16 is fitted to slide in a groove formed in the side of the bore, so that the nut can be turned by turning the ram part 4, so as to adjust the extent to which the two ram parts 3 4 can be separated, and thereby regulate the length of the stroke. A nut, 17, is fixed on the end of the bolt to prevent the nut 16 from being screwed off.

I claim as my invention—

1. In a riveting-machine, the combination of operating mechanism with a ram made in two parts, between which is interposed a body of liquid having access to a loaded escape-valve, the two parts of the ram being so con-

nected by a bolt that the part carrying the die may be moved backward by the other portion of the ram, all substantially as described.

2. The combination of the two-part ram, the connecting-bolt 15 and adjusting-nut, and the loaded escape-valve with the valve 11, opening inward, and the toe-rod 2, adapted to be operated by some working part of the machine, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HECTOR MACCOLL.

Witnesses:
EDMUND HUNT,
LOCK MOORE.