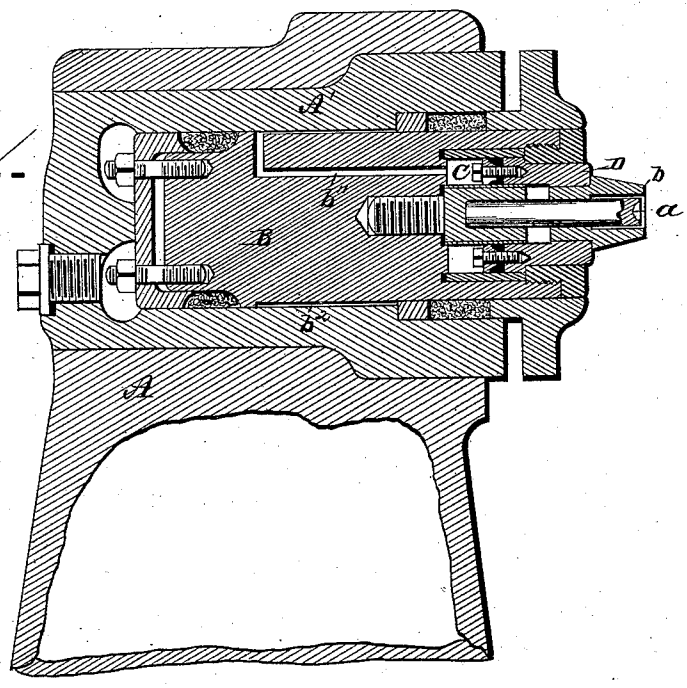
(No Model.)

R. H. TWEDDELL, J. PLATT & J. FIELDING.

HYDRAULIC RIVETING MACHINE.

No. 307,361. Patented Oct. 28, 1884.

FIG. 1.



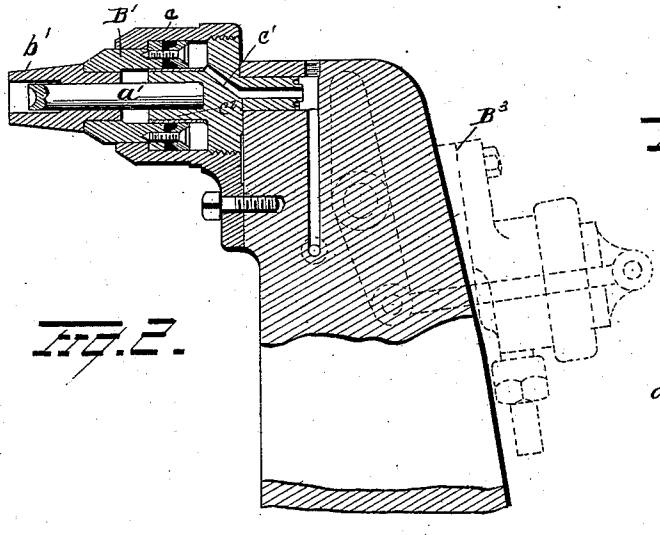
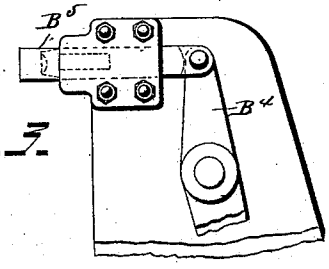


FIG. 2.

FIG. 3.



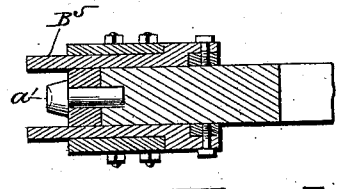


FIG. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

RALPH HART TWEDDELL, OF WESTMINSTER, COUNTY OF MIDDLESEX, AND JAMES PLATT AND JOHN FIELDING, OF GLOUCESTER, COUNTY OF GLOUCESTER, ENGLAND.

HYDRAULIC RIVETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 307,361, dated October 28, 1884.

Application filed April 19, 1884. (No model.) Patented in England November 10, 1880, No. 4,609.

To all whom it may concern:

Be it known that we, RALPH HART TWEDDELL, of Westminster, in the county of Middlesex, and JAMES PLATT and JOHN FIELDING, of Gloucester, in the county of Gloucester, and Kingdom of Great Britain, have invented certain new and useful Improvements in Hydraulic Machines for Riveting; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improved direct-acting hydraulic machines for riveting and such like operations; and it consists in the parts and combinations of parts, as will be more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in vertical longitudinal section of our improved device. Fig. 2 is a similar view of the hob or head which holds up against the riveting-pressure, and Figs. 3 and 4 are detached views.

A represents the base or frame of the machine, provided with the cylinder A′, in which the plunger B works. This plunger B carries the riveting-tool or heading-die *a*, rigidly secured to the outer end thereof, and is provided with cylinder C, in which the annular plunger D works. The cylinder C, in which the plunger D works, communicates by a channel, *b*″, with an annular space, b^2, around the main plunger B, which space is always in communication with the supply of working-fluid. When, for the purpose of riveting, the pressure is permitted to act on the base of the plunger B, the plunger B advances and the pressing-tool *b* of the plunger D takes a bearing on one of the plates to be riveted, squeezing it firmly against the other plate, while the riveting-tool or heading-die *a* advances and upsets the rivet. On relieving the pressure on the base of the plunger B, the pressure, still acting on cylinder C, causes the drawback of the large plunger. The pressure on the base or rear end of the plunger B is greatly in excess of the pressure on the smaller area in the cylinder C, and hence, after the pressing-tool has been forced solidly against the plates to be riveted and is prevented from advancing any farther, the plunger B still continues to advance and forces the water from the cylinder C. The riveting-tool rests on one side of the plates or structure being operated on, and the holding-up tool on the other side. As soon as the rivet has been upset the pressure-water is allowed to escape from behind the plunger B. If the closing-plunger is located in the larger plunger, B, as soon as the pressure against the inner face of the plunger is relieved, the water, acting against the rear face of the plunger D, (which is bearing against the plates being riveted,) forces the plunger B away from the plates being riveted. As there is no pressure behind B, the plungers B and D can be moved still farther inward and away from the plates being riveted by exerting a pressure on the outer end of either plunger. Water is then admitted to the rear of plunger B, and the latter moves outward, carrying with it the small closing-plunger D, which, together with the holding-up tool, firmly clamp the plates together. The riveting-tool again advances and upsets the rivet, and so on continuously.

When it is desired to press the plates to be riveted from opposite sides, the hob or post may, as shown in Fig. 2, be in a like manner fitted with an annular plunger, B′, carrying a pressing-tool, *b*′, surrounding the holding-up tool *a*′, situated in the same plane with the movable tool *a*.

Either of the devices shown in Figs. 2, 3, and 4 can be employed in connection with the machine shown in Fig. 1. The holding-up tool *a*′ of either of these devices rests in the same horizontal plane with the riveting-tool *a*, sufficient space, however, being left between them for the free introduction of the plates to be riveted. In the device shown in Fig. 2 the cylinder *c* is rigidly secured in position by one or more bolts, and the pressing-tool rigidly secured to the head of said cylinder. This head is provided with a port, *c*′, for the passage of the actuating-fluid. The plunger B′ is hollow and slides on the projection c^2 of the head of the cylinder, and is provided at its outer end with the pressing-tool *b*′. In cases where it is inconvenient to allow space for the pressing-plunger in the hob, as shown in Fig.

2, it may be arranged as shown by the dotted lines B^3 on the back of the hob, and connected as shown in the part side elevation, Fig. 3, and plan, Fig. 4, by side rods and side levers, B^4, to two sliding bars, B^5, one on each side of the holding-up tool a', the ends of these bars taking a bearing against one of the plates to be riveted and operated in the same manner as the pressing-tool b'.

The hob or post herein shown and described forms a part of the machine proper, and is shown detached for the want of space on the sheet of drawing.

We are aware that it is not broadly new to provide a closing-plunger encircling or inclosing a riveting-plunger, and a hob or post, and hence we do not claim these devices, broadly; but,

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine for riveting, the combination, with a cylinder and a plunger provided with a heading-die, of a hob or post provided with a stationary holding-up tool, and a movable tool for closing and pressing together the plates to be riveted.

2. In a riveting-machine, the combination, with a cylinder and a plunger provided with a heading-die, of a stationary holding-up tool and a pressing-tool surrounding said holding-up tool and operated by hydraulic pressure.

3. The combination, with a cylinder and a plunger provided with a heading-die, of a hob or post provided with a holding-up tool, a small cylinder surrounding said tool, a plunger working in said last-named cylinder, and a pressing-tool secured to said plunger, substantially as set forth.

4. The combination, with a large cylinder, plunger, and heading-die secured to the latter, of an annular cylinder formed within the main plunger, a smaller plunger working in said cylinder, a pressing-tool secured to the small plunger, and a fixed holding-up tool situated in the same horizontal plane with the heading-die, substantially as set forth.

5. The combination, with a large cylinder, plunger, and heading-die, the said plunger being provided with a small cylinder and ports, of a smaller plunger situated within said latter cylinder, and provided with a pressing-tool, and a hob or post provided with a holding-up tool, substantially as set forth.

6. The combination, with a large cylinder, a larger plunger provided with a heading-die, a small cylinder formed within the large plunger, ports connecting this small cylinder with the fluid supply, a small plunger working in the smaller cylinder, and a pressing-tool secured to the small plunger, of a hob or post provided with a holding-up die, and a pressing-tool, substantially as set forth.

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

RALPH HART TWEDDELL.

Witnesses:
H. G. SCOTT,
WM. BAILEY.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

JAMES PLATT.
JOHN FIELDING.

Witnesses:
JOHN A. POPE,
H. CADENNE.