No. 646,952. Patented Apr. 10, 1900.

C. J. CARNEY & J. C. GORTON.

RIVETING MACHINE.

(No Model.) (Application filed June 2, 1899.)

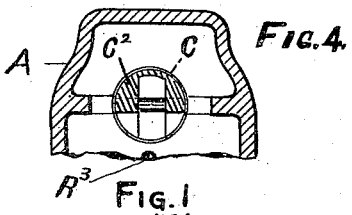

FIG. 4.

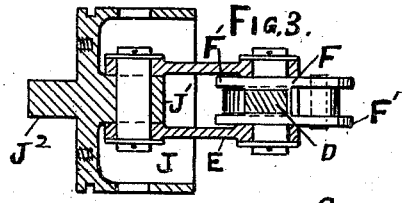

FIG. 3.

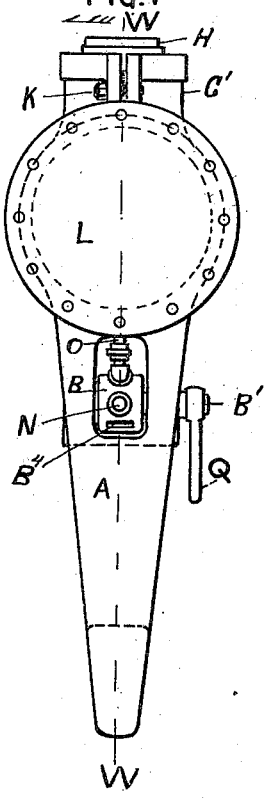

FIG. 1.

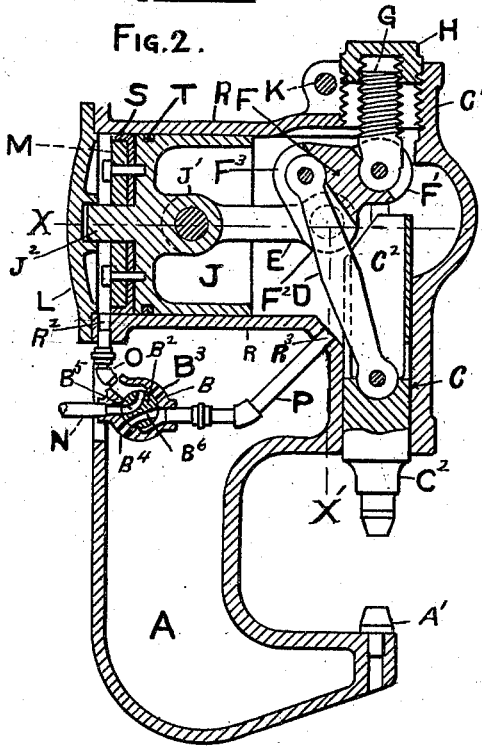

FIG. 2.

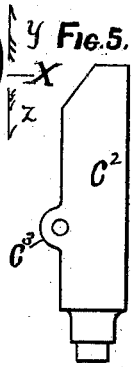

FIG. 5.

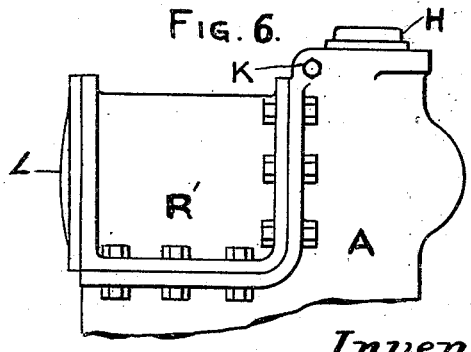

FIG. 6.

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UNITED STATES PATENT OFFICE.

CHARLES J. CARNEY AND JOHN C. GORTON, OF DUNKIRK, NEW YORK.

RIVETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 646,952, dated April 10, 1900.

Application filed June 2, 1899. Serial No. 719,076. (No model.)

To all whom it may concern:

Be it known that we, CHARLES J. CARNEY and JOHN C. GORTON, citizens of the United States, residing at Dunkirk, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Riveting-Machines; 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

This invention relates to riveting-machines adapted to be operated either by steam or compressed air; and it consists, substantially, in the construction and arrangement of a cylinder, a plunger-die, a bell-crank lever, a link connecting the piston with the power-arm of the bell-crank lever, and a link connecting the weight-arm of the bell-crank lever with the plunger-die, so that the maximum power of the cylinder is exerted on the plunger-die with an increasing efficiency from the beginning to the end of its stroke, and also constructing the frame of the machine so as to inclose the mechanism, the cylinder being either an integral part thereof or made removable therefrom, these and other features of the invention being hereinafter fully set forth and described, and illustrated in the accompanying drawings, in which—

Figure 1 is a view in elevation of the rear end of the machine. Fig. 2 is a vertical central section on the line W W in Fig. 1 looking in the direction of the arrow. Fig. 3 is a transverse section of the piston and bell-crank-lever mechanism on the line X X in Fig. 2 looking in the direction of the arrow Y. Fig. 4 is a section of a portion of the frame and of the plunger-die on the line X X in Fig. 2 looking in the direction of the arrow Z. Fig. 5 is a view in elevation of a modified construction of the plunger-die. Fig. 6 is a view in elevation, showing a modified construction of the upper part of the frame with the cylinder removable.

In the drawings thus illustrating our invention, A is the frame of the machine, either made of a single casting with a removable piston-head L, as shown in Figs. 1 and 2, or with removable cylinder R′, as illustrated in the modified construction shown in Fig. 6.

The cylinder R is at right angles to the guide C of the plunger-die C^2. The frame A extends downward below the cylinder R for some distance, where it curves laterally to a point directly under the center of the plunger-guide C, so as to support an anvil-die A′. The plunger-guide C extends up through the top of the frame A, where there is a screw-threaded sleeve extension C′ thereof, one side of which is split and provided with a clamping-bolt K. In this sleeve extension C′ there is a hollow nut H, in which the upper part of the fulcrum G is mounted, in which fulcrum the axis F′ of the bell-crank lever F is pivoted in line with the axis of the plunger-die C^2 hereinafter described, and by means of which nut H the fulcrum G can be adjusted up and down, as desired. The piston J is hollow at its rear end and is mounted in the cylinder R and provided with a central boss J′, in which one end of a double link E is pivoted, the opposite end of said link being pivoted to the power-arm F^2 of the bell-crank lever F. A link D is also pivoted at one end to the weight-arm F^3 of the bell-crank lever F, the opposite end of said link being pivoted in a slot in the plunger-die C^2, near the lower end thereof, so that as the piston J moves forward the power-arm F^2 travels across the line of greatest efficiency and at the same time the weight-arm F^2 travels toward the line of greatest efficiency, the bell-crank lever F, pivoted at its axis F′ to the fulcrum G, the link E, connecting the power-arm F^2 thereof with the piston J, and the link D, connecting the weight-arm F^3 thereof with the plunger-die C^2, operating to communicate the power of the piston J to the plunger-die, so as to move the plunger-die C^2 up and down and deliver to the plunger-die the full effective power of the piston both at the beginning and end of its downward traverse.

The end of the front end of the piston J is provided with a cupped disk S, of leather or other suitable material, which is secured to the end of the cylinder by a plate M, bolted thereto. The piston J is also provided with cylinder-rings T of the usual construction. The front end of the piston J is also provided with a central projection J^2, which enters a

central recess in the piston-head L, so that the steam or air inclosed therein operates to cushion the piston at the end of its backward traverse. In the lower part of the cylinder R there is a port R^2, entering the cylinder at the front, and a port R^3, entering the cylinder at the rear of the piston J, from which ports pipes O and P connect with a plug-valve B, the stem B′ of which extends out to one side of the frame A, where it is provided with an operating-lever Q. This valve B has exhaust-ports B^3 and B^4, and the valve-plug B^2 is provided with passages B^5 and B^6. The passage B^5, when registering with the inlet-pipe N and the pipe O, allows the steam or compressed air to enter the cylinder through the port R^2 and drive the piston J forward, while at the same time the passage B^6 registers with the port B^4 and the pipe P, so that any steam or air in the cylinder behind the piston will exhaust through the port R^3 and the pipe P. When, however, the handle Q is moved back, so that the passage B^5 registers with the pipe O and the port B^3, the steam or compressed air in front of the piston exhausts through the port B^3, and the passage B^6, then registering with inlet-pipe N and the pipe P, allows the steam or compressed air to enter the cylinder behind the piston J through the pipe P to mave the piston back on its return stroke. Thus the machine is operated by moving the handle Q back and forth, as above described.

The construction of plunger-die shown in Fig. 5 is simply a modified construction of the plunger-die shown in Fig. 2, in which the link D is pivoted in a slot in the plunger-die, while in this modified construction the link D is pivoted to an ear or ears C^3 on one side of the plunger-die.

In the modified construction shown in Fig. 6 the cylinder R′ is cast separate from the frame A and bolted thereto. In all other respects this construction is the same as hereinbefore described.

Having thus described our invention so as to enable others to construct and use the same, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination in a riveting-machine, of a cylinder and a piston operating therein, a plunger-die, a bell-crank-lever and link mechanism connecting the piston and plunger-die and so arranged that the power-arm of the bell-crank lever travels across, and the weight-arm thereof toward the line of greatest efficiency, substantially as set forth.

2. The combination in a riveting-machine, of a cylinder and a piston operating therein, a plunger-die, a bell-crank lever, the axis of which is pivoted to a fulcrum in line with the travel of the plunger-die, a link connecting the piston with the power-arm of the bell-crank lever, and a link connecting the weight-arm thereof with the plunger-die, substantially as set forth.

3. The combination in a riveting-machine, of a frame made of a single casting, chambered out so as to inclose the mechanism, a cylinder in said frame, a piston in said cylinder, a plunger-die guide in said frame substantially at right angles to the travel of the piston, an anvil-support on said frame in line with the travel of the plunger-die, a bell-crank lever the axis of which is pivoted to an adjustable fulcrum in line with the travel of the plunger-die, a link connecting the piston with the power-arm of said bell-crank lever, and a link connecting the weight-arm of said bell-crank lever with the plunger-die, substantially as set forth.

4. The combination in a riveting-machine, of a cylinder and piston, a plunger-die, a bell-crank-lever and link mechanism connecting said piston and plunger-die, so arranged that the power-arm of said bell-crank lever travels across, and the weight-arm toward the line of greatest efficiency, whereby the full power of the piston is delivered to the plunger-die with an increasing efficiency from the beginning to the end of the stroke, substantially as set forth.

5. The combination in a riveting-machine, of an inclosed frame, comprising substantially a cylinder, a plunger-die guide, and an anvil-die support, a piston, a plunger-die, bell-crank-lever and link mechanism connecting said piston and plunger-die inclosed within said frame, and an adjustable fulcrum for said bell-crank-lever mechanism, substantially as set forth.

6. In a riveting-machine, a cylinder, a piston operating therein, a plunger-die operating at substantially right angles to the travel of the piston, bell-crank-lever and link mechanism connecting the piston and plunger, and a fulcrum for said bell-crank lever adjustable in line with the travel of the plunger, substantially as set forth.

7. The combination in a riveting-machine, of a cylinder and piston, a plunger-die operating substantially at right angles to said piston, bell-crank-lever and link mechanism connecting the piston and the plunger, and means for adjusting the whole bell-crank-lever mechanism in line with the travel of the plunger-die, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES J. CARNEY.
JOHN C. GORTON.

Witnesses:
R. C. COLMAN,
GEO. A. STARR.