

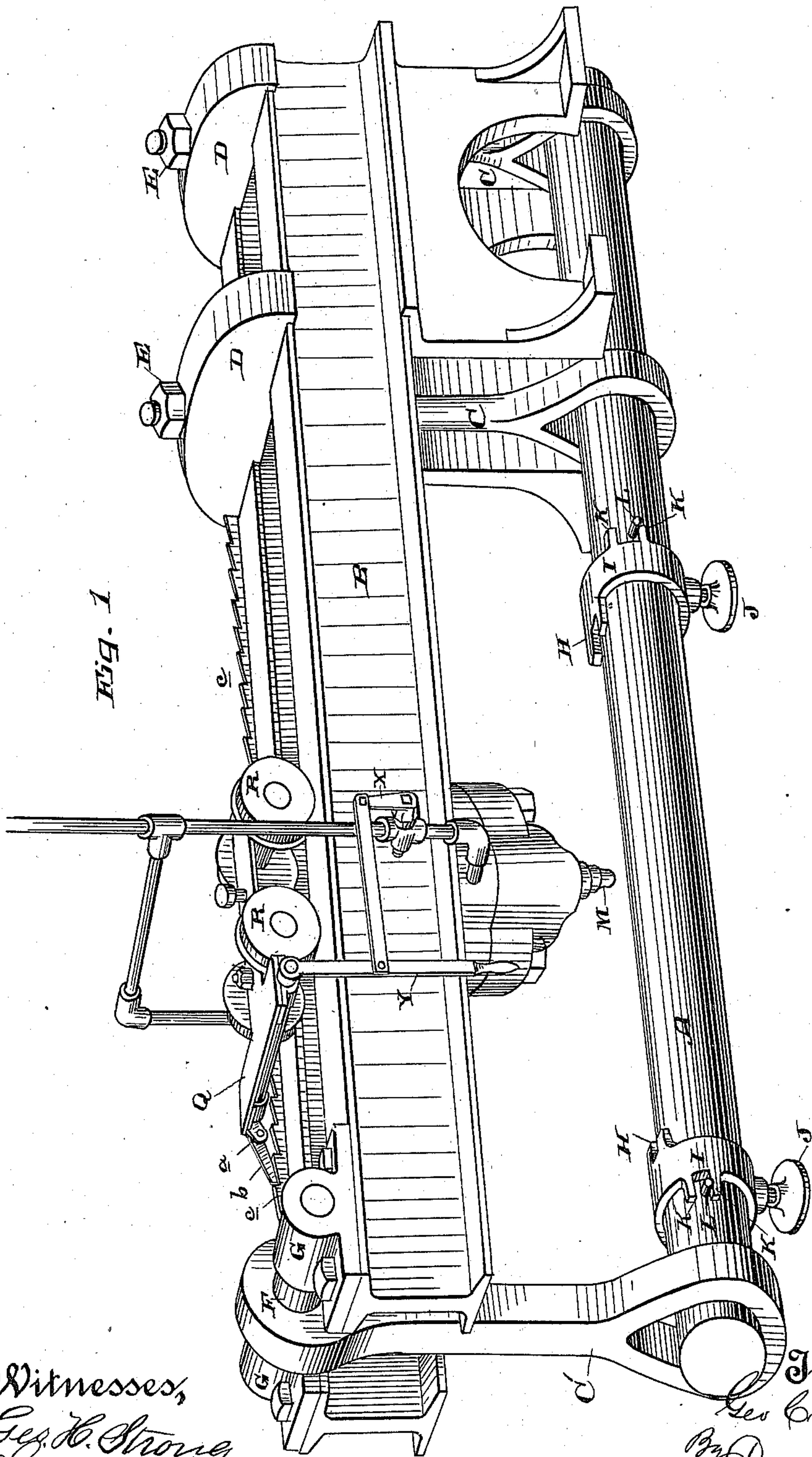
(No Model.)

2 Sheets—Sheet 1.

G. CUMMING.
PIPE RIVETING MACHINE.

No. 382,142.

Patented May 1, 1888.



Witnesses,
Geo. H. Strong
J. H. House

Inventor,
Geo. Cumming
By Dewey & Co.
attys

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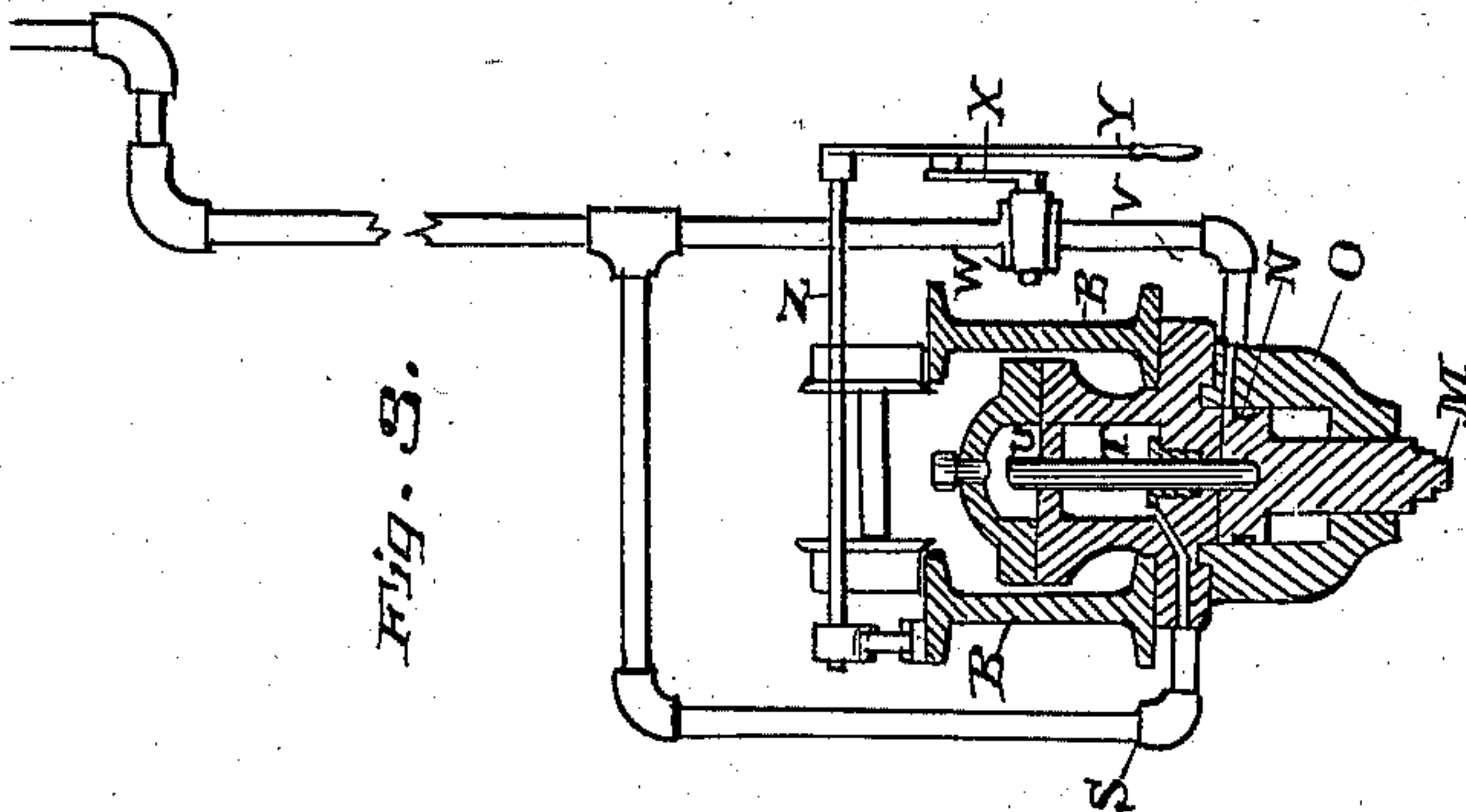


Fig. 3.

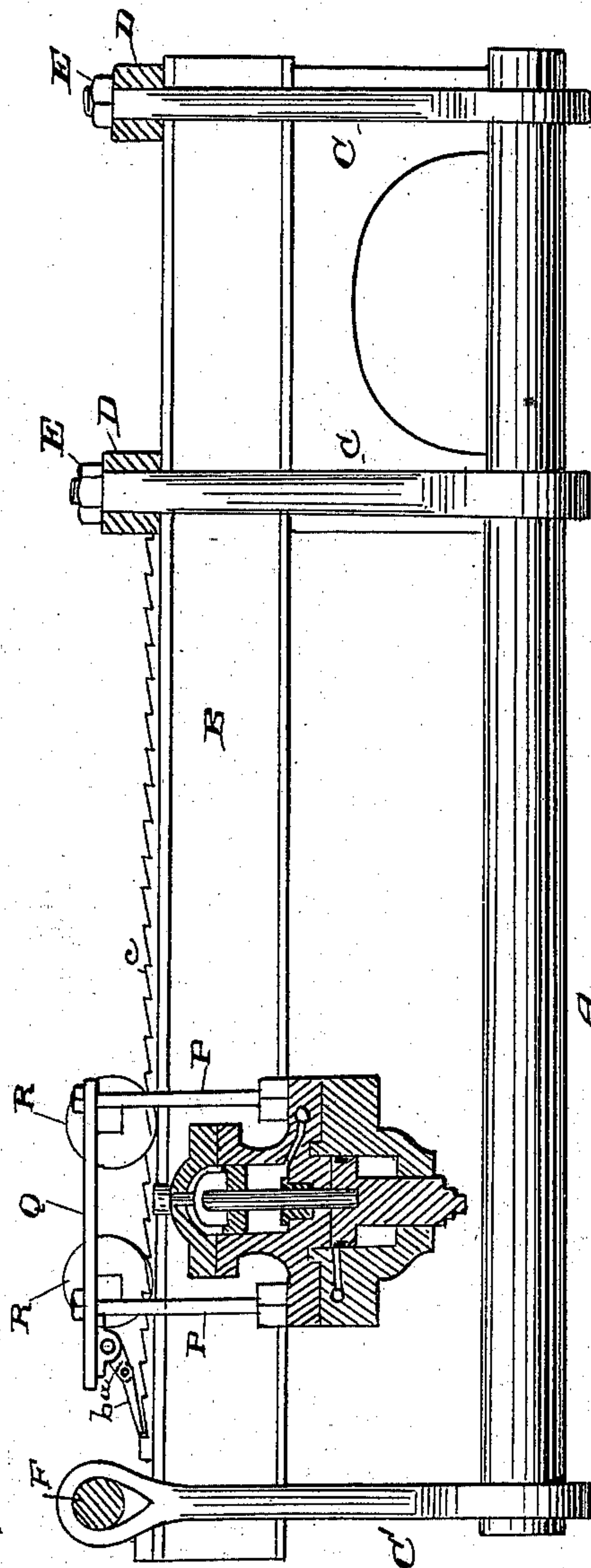


Fig. 2.

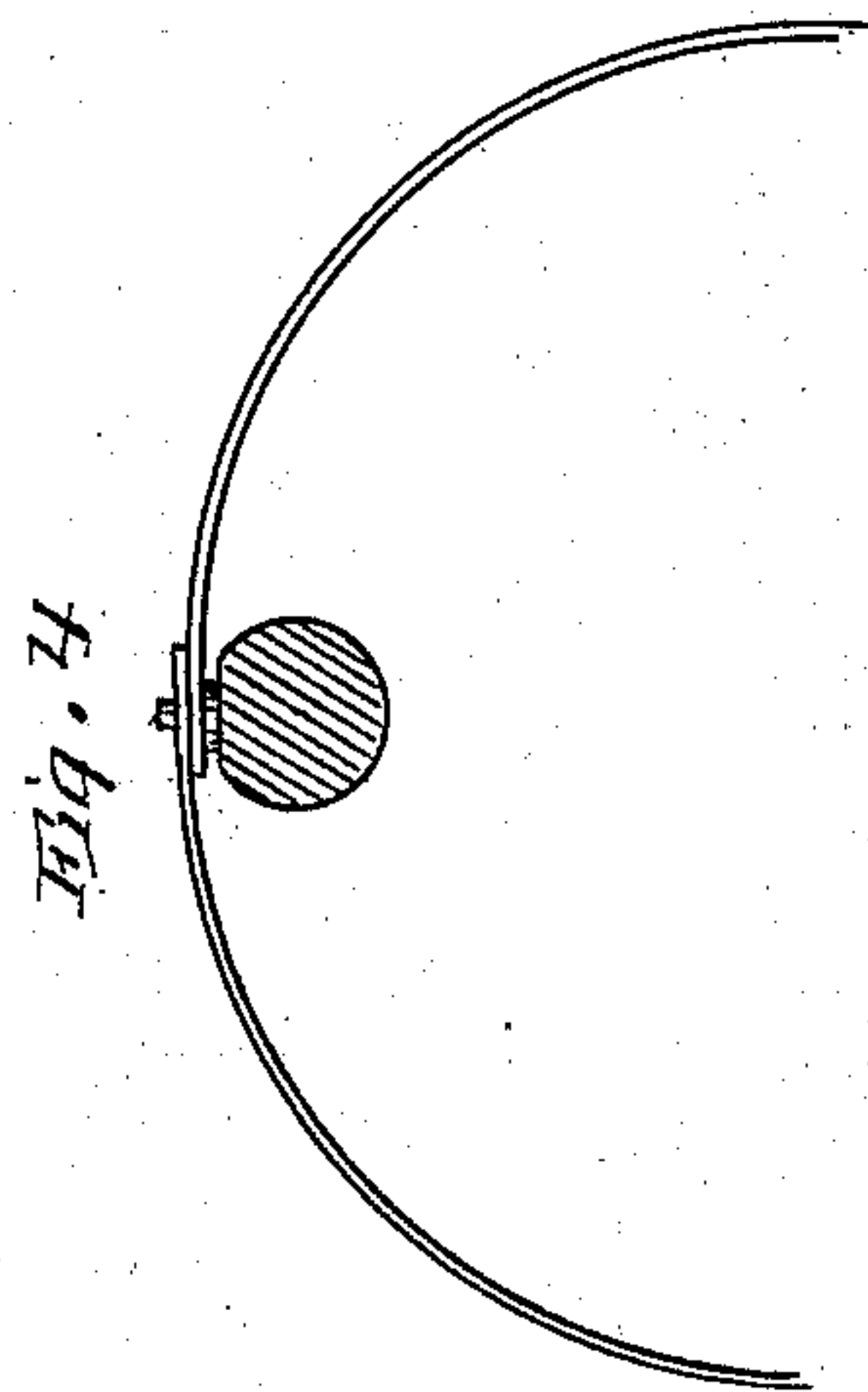


Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE CUMMING, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO FRANCIS SMITH, OF SAME PLACE.

PIPE-RIVETING MACHINE.

SPECIFICATION forming part of Letters Patent No. 382,142, dated May 1, 1888.

Application filed October 29, 1887. Serial No. 253,787. (No model.)

To all whom it may concern:

Be it known that I, GEORGE CUMMING, of the city and county of San Francisco, State of California, have invented an Improvement in Pipe-Riveting Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to machines for riveting tube and pipe sections; and it consists of a mechanism the details of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a general perspective view of the exterior of the apparatus. Fig. 2 is a longitudinal vertical section taken through the hydraulic cylinder. Fig. 3 is a transverse vertical section. Fig. 4 shows the lapping edges of the sheet resting upon the riveting-bar.

In making pipe the cylindrical sections are riveted up in short lengths, and these lengths are afterward riveted together to form the long pipe.

My apparatus is used to rivet the straight seams of the short sections. It consists of a horizontal bar, A, slightly flattened upon the upper surface, and this bar is supported from a strong horizontal frame-work, B, made of angle, channel, or I shaped bars of sufficient strength suitably fixed. One end of the bar A is supported from the frame-work D by eyebolts or links C, the upper ends of which pass through the yokes D, and they are adjusted by nuts E to the proper position. These yokes D rest upon the tops of the angle bars B, which form the supporting-frame, and the eyebolts extend sufficiently below this frame to support the bar A in a horizontal position and at the proper distance below the frame to enable the riveting apparatus to act in connection with it. The opposite end of the bar A has a similar eyebolt or link, C', the hole at the lower end slipping over the bar A and supporting it after the pipe-section has been placed upon the bar ready for riveting. The bar is thus strongly supported and serves as an anvil upon which the rivets are headed up. In order to remove the link or eyebolt C when it is necessary to place a section upon the bar or remove it, the upper end of the link is supported by a transverse shaft or pin, F, which passes through it and has its ends journaled in boxes G upon the frame B. This allows the

lower end of the link or yoke to be swung outward, leaving the end of the bar A free for the reception or removal of a pipe-section, the bar being held in its horizontal position meantime by the yokes or holding devices C C at the opposite end.

When the pipe section has been placed upon the bar A, the rivets all being in place and projecting through the holes which have previously been punched in the edges of the section, it is necessary to hold the section in place and prevent it from turning or moving out of the way. Rivets are placed in all of the holes from one end to the other; but the rivets in the two end holes will not be headed up with the straight seam, these holes remaining until the circular seams are riveted. In uniting the sections together the rivets which are in these holes slip into notches (shown at H) in the collars I, which collars fit upon the bar A, as shown in Fig. 1. The pipe-section being in place, these collars are slipped up, so that the lugs fitting the grooves or notches H will slip over the ends of the pipe-section until the rivets in the end holes lie in these notches. The collars are then secured to the bar A by means of set or holding screws J. When a single line of riveting is used, no adjustment of the collars will be necessary; but when a double line of riveting is used it will be necessary to turn the collars sufficiently to bring the second line of rivets beneath the riveting-machine. The collars therefore have lugs K projecting at one side, these lugs being a sufficient distance apart so that the pin L, which projects from the shaft A, lies between the lugs and acts as a stop, one lug lying against the pin when one row of rivets is being headed up, after which, the set-screws being loosened, the collars I are turned around until the other lug comes in contact with the pin L, and this will have turned the pipe-section sufficiently to bring the other line of rivets beneath the riveting device.

The riveting is done by means of a plunger, M, which is actuated by a piston, N, within the hydraulic cylinder O. This cylinder is suspended from the channel-irons which form the frame B by means of stout suspending rods or links P. These links have their upper ends attached to a carriage, Q, which is mounted upon wheels R, these wheels traveling upon

the top of the frame B, so that the hydraulic cylinder may be moved along above the riveting-bar A and the pipe which is supported upon it for the purpose of heading the rivets.

5 The piston N is forced down by water under pressure, which is admitted through a pipe, S, as plainly shown in Fig. 3. Connected with this piston is a stem, T, which extends upward into the upper part or smaller cylinder, having
10 within it a piston, U, with which the stem T connects. A pipe, V, leads water under pressure into the smaller cylinder beneath the piston U, and the tendency of this pressure is to raise the pistons and with them the plunger
15 M. This will occur whenever the pressure is taken off of the larger piston, and whenever water is admitted above the piston N the greater area causes it to overcome the pressure upon the piston U, and thus force the riveting-plunger M down with sufficient force to
20 head the rivet. A jointed flexible or other pipe is employed to allow the cylinder to travel back and forward.

The admission of water into the space above
25 the larger piston, N, is controlled by a three-way cock, W, and this is operated by a crank-arm, X, and a hand-lever, Y, so that by the movement of the lever water may be admitted to force the plunger down and afterward allow
30 it to escape, so that the smaller piston will act to raise it again.

The shaft Z, upon which the lever Y is secured, extends across the carriage Q, from which the hydraulic cylinder is suspended, and
35 is journaled thereon. At the opposite end of this shaft is a short crank-arm, a, having a pawl, b, pivoted to it. This pawl engages the teeth c of a rack formed upon or secured to the upper part of the frame B, upon which the
40 riveting-cylinder travels, and whenever the lever Y is moved so as to allow the riveting-plunger to be raised its action will, through the pawl b, advance the carriage and the hydraulic cylinder, so that the plunger will
45 stand above the next rivet, the teeth in the rack being placed to correspond with the distance between the rivet-holes in the pipe-sections.

It will be manifest that a screw, weighted
50 arm or pawl, or other mechanical device may be employed in place of the pawl and ratchet here described without essentially changing the character of my invention.

After the straight seams have been riveted
55 the set-screws J may be loosened and the collars I moved backward, so as to release the pipe, and by turning the suspending-yoke C' backward the end of the bar A will be left free, and the pipe-section, slipping over the
60 outer collar and the end of the bar, may be taken off. Another pipe-section is placed upon the bar, the yoke C swung into place to support the bar, which thus forms the anvil upon which the rivets are headed, and the work
65 will go on.

By this mechanism pipe-sections may be very rapidly riveted up with the least amount

of handling, and by means of the movable or traveling hydraulic cylinder, with its plunger and the automatic mechanism for advancing 70 it, the work is very rapidly completed.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The horizontal riveting bar or anvil 75 having its ends suspended beneath the track or frame, in combination with the traveling riveting-plunger, substantially as herein described.

2. The horizontal riveting bar or anvil hav- 80 ing one end fixed or suspended, as shown, in combination with a swinging supporting link or yoke at the opposite end, substantially as herein described.

3. The horizontal riveting bar or anvil hav- 85 ing one end suspended in fixed supports and the other with the swinging or movable support, in combination with the notched or grooved collars, with the set-screws, whereby the pipe-section is held in position for riveting, 90 substantially as herein described.

4. The collars fitting the riveting bar or anvil and having the grooves or notches in which the end rivets of the pipe section fit, and the supplemental groove through which 95 fixed pins upon the bar extend and by which the movement of the section is regulated for riveting double seams, substantially as herein described.

5. The horizontal riveting bar or anvil with 100 its holding-collars, and the frame beneath which the bar is supported, in combination with the hydraulic cylinder, the vertically-moving plunger, the water-supply pipes, and the three-way cock or valve whereby the pis- 105 tons and riveting-plunger are actuated, substantially as herein described.

6. The horizontal riveting bar or anvil with its fixed and swinging supports, and the pipe- 110 holding collars, in combination with the hydraulic cylinder and riveting-plunger, the traveling carriage from which the cylinder is suspended, and the feed mechanism whereby the carriage and cylinder are advanced a dis- 115 tance equal to that between the rivet-holes in the pipe, substantially as herein described.

7. The hydraulic riveting-cylinder sup- 120 ported from the traveling carriage upon the main frame, the pipes supplying water to the pistons within the cylinder, and the three-way cock or valve whereby the supply is admitted and discharged, in combination with the swinging lever by which the cock or valve is opened and closed, and the feed mechanism is actuated simultaneously with the movement 125 of the valve by the same lever, substantially as herein described.

In witness whereof I have hereunto set my hand.

GEORGE CUMMING.

Witnesses:

S. H. NOURSE,
H. C. LEE.