

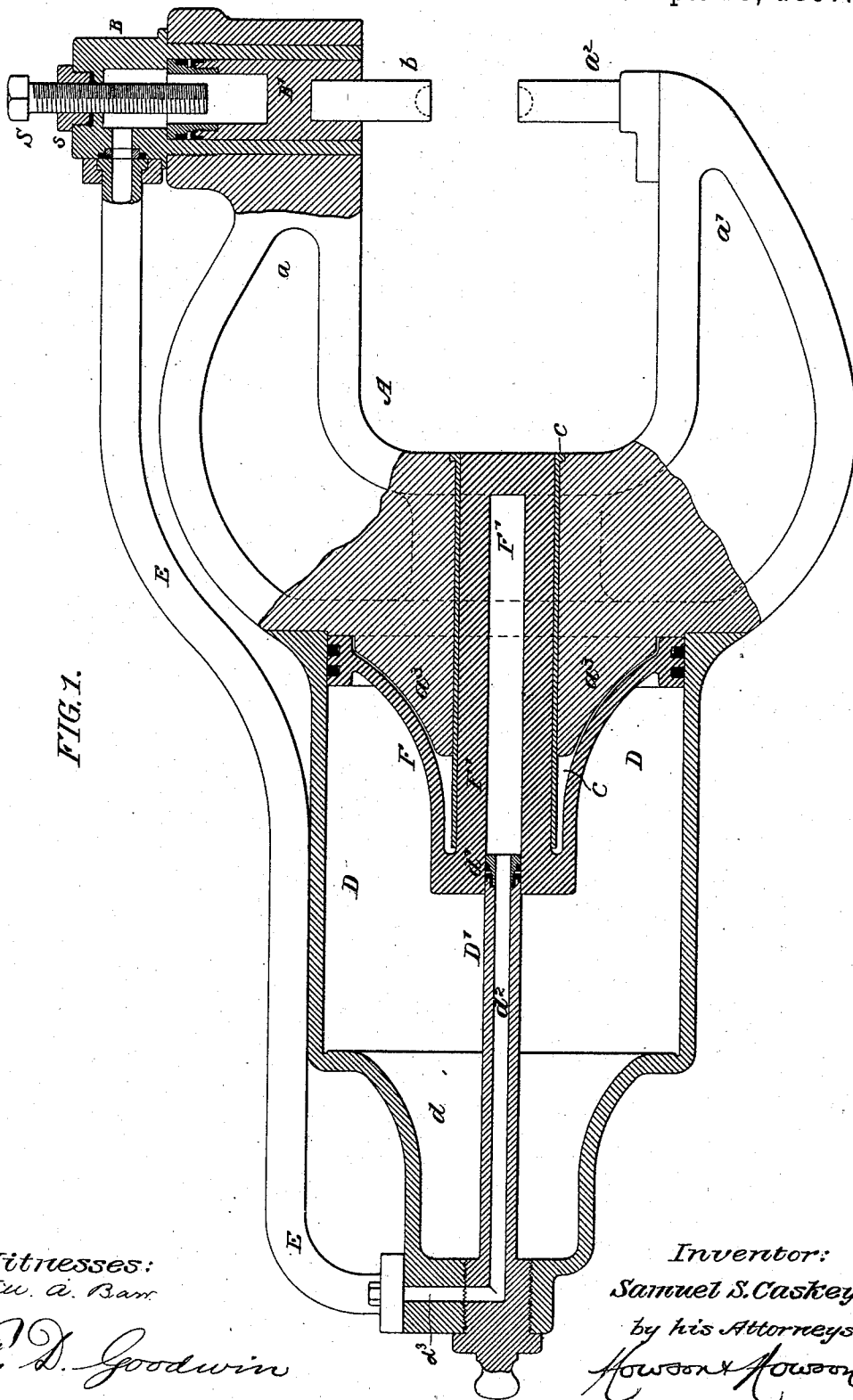
(No Model.)

4 Sheets—Sheet 1.

S. S. CASKEY.
RIVETING MACHINE.

No. 580,771.

Patented Apr. 13, 1897.



Witnesses:
H. A. Barr

C. D. Goodwin

Inventor:
Samuel S. Caskey
by his Attorneys

Howson & Howson

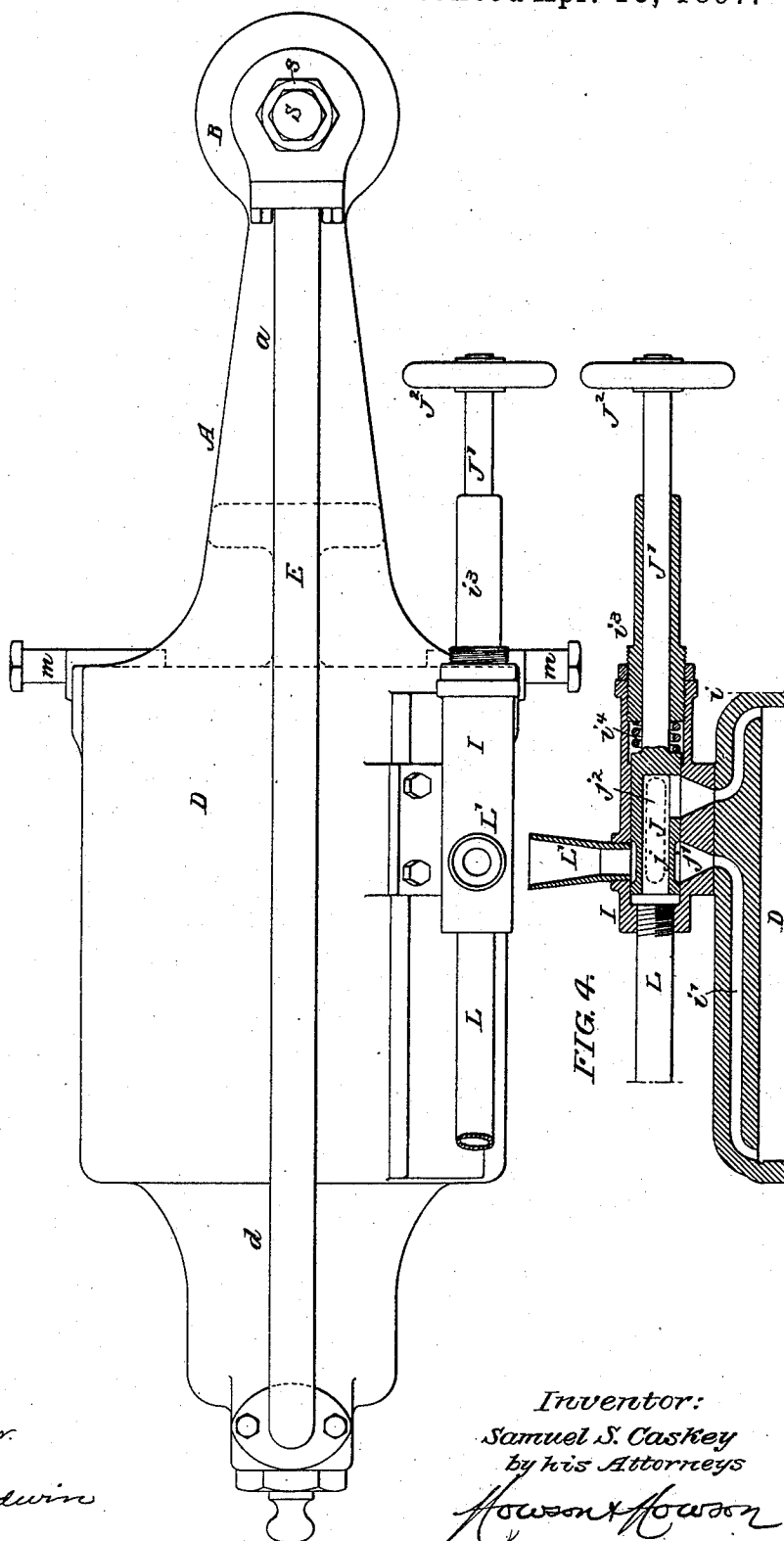
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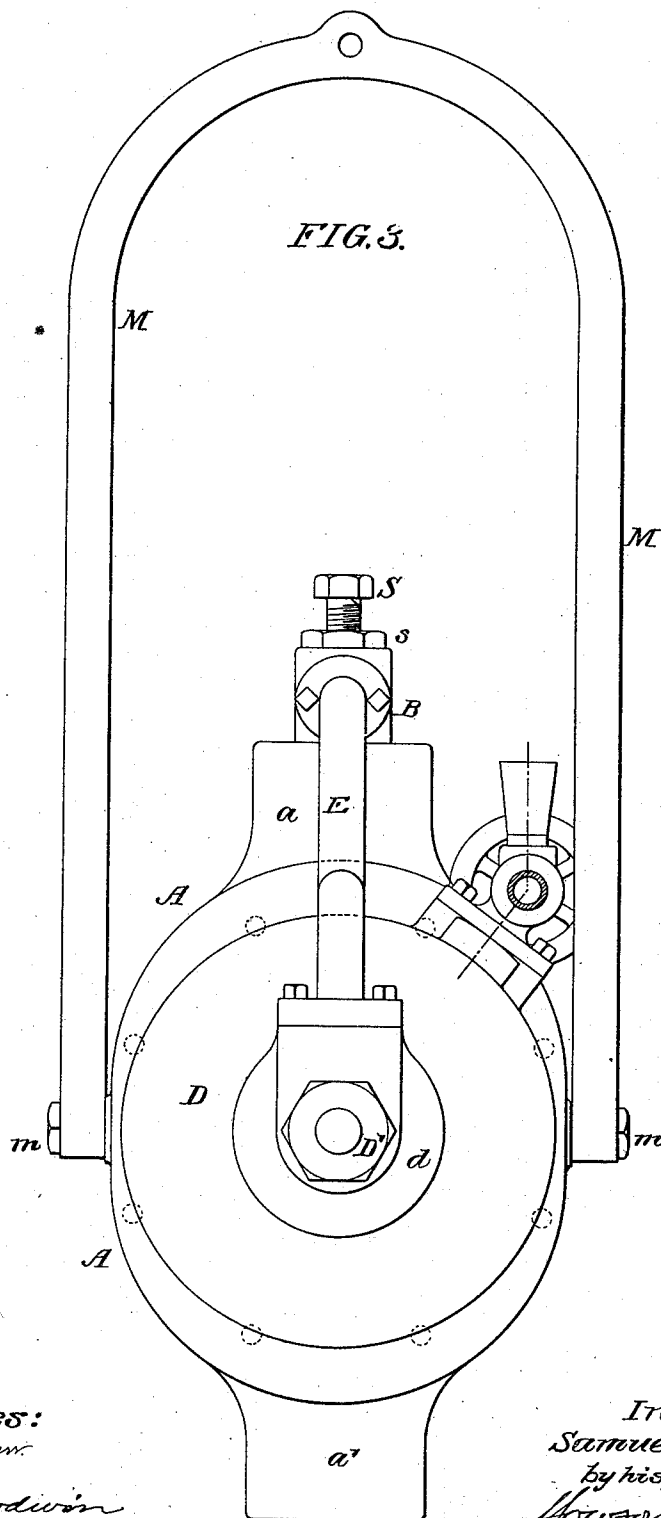
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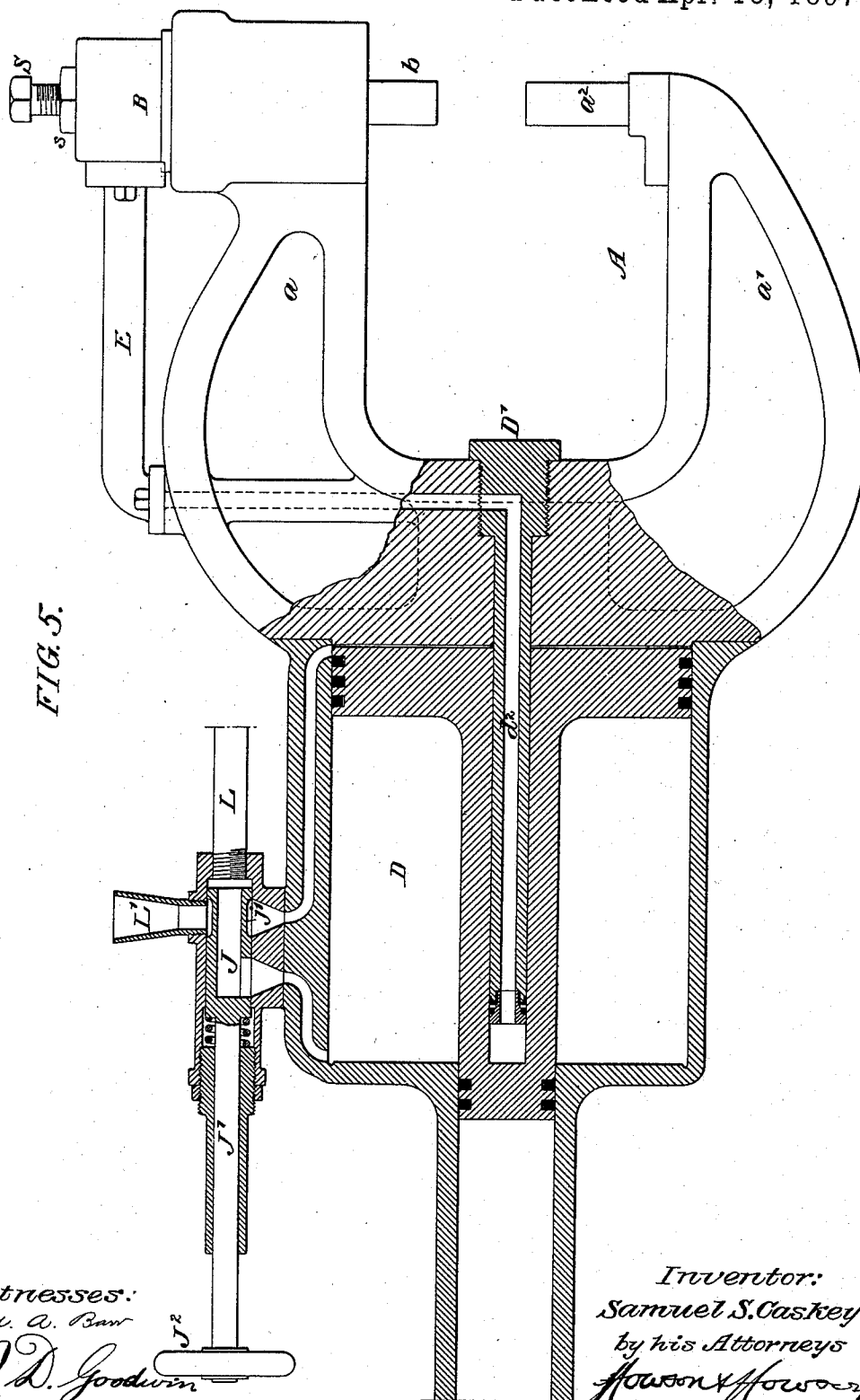
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UNITED STATES PATENT OFFICE.

SAMUEL S. CASKEY, OF PHILADELPHIA, PENNSYLVANIA.

RIVETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 580,771, dated April 13, 1897.

Application filed July 23, 1896. Serial No. 600,305. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. CASKEY, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Riveting-Machines, of which the following is a specification.

My invention relates to a machine especially adapted for riveting, but which may be adapted to punching and shearing by substituting for the rivets punching-dies or shear-blades.

The object of my invention is to so design the machine that it will be simple in construction and effective in its work and can be readily taken apart for repairs and which will use the operating fluid economically.

In the accompanying drawings, Figure 1 is a side view, partly in section, illustrating my improved riveting-machine. Fig. 2 is a plan view. Fig. 3 is a rear view. Fig. 4 is a sectional view through the valve and casing, and Fig. 5 is a view of a modification.

A in the present instance is a yoke-frame made in a single casting having two arms $a a'$, and on the lower arm a' is a block a^2 , shaped to correspond to the head of the rivet. Screwed into the arm a in the present instance is a cylinder B, in which is a plunger B', having at one end a die or dolly b , adapted to form the rivet. On the opposite end of the plunger is suitable packing to prevent the fluid leaking past the plunger.

Secured to the rear of the yoke-frame is a cylinder D, having an extension d , preferably shaped as shown in the accompanying drawings, and D' is a fixed plunger screwed into the rear of the cylinder-casing. This plunger has packing d' at its inner end and has a passage d^2 communicating with the passage d^3 in the casing, which communicates in turn with the passage in the tubular connection E, which is coupled to the cylinder B.

F is a piston, preferably of the shape shown, its rim being provided with suitable packing, so as to fit snugly within the cylinder. This piston has a center projection forming a cylinder F', which is adapted to a bushing c in the frame A. This frame has an extension a^3 projecting into the cylinder D, as shown in Fig. 1, so as to give full bearing to the bushing c . The piston-cylinder is closed at one end, and the fixed plunger D' is adapted

to this piston-cylinder, as shown. The object of this construction is to transmit the pressure exerted upon the piston through the liquid contained within the piston-cylinder, passage in the plunger, the tube, and the cylinder B to the plunger B'.

Any form of valve mechanism may be used, but I prefer the one which I will now proceed to describe.

I is the valve-chamber, in which is a valve J of the cylindrical type. This valve has a central inlet-passage j , an exhaust-channel j' , and a passage j^2 .

$i i'$ are passages leading from the ends of the cylinder D to the ports of the valve-chamber I.

L is an inlet-pipe, and L' the exhaust communicating with the valve-chamber, as shown in Fig. 4.

When the valve is in the position shown in Fig. 4, air under pressure is admitted to the forward end of the cylinder D and exhausted from the rear end. When it is turned one-quarter, the two ends of the cylinder D communicate and the inlet and exhaust pipes are closed to the cylinder D, so as to allow the air in the forward end of the cylinder, after it has actuated the piston, to flow into the rear end of the cylinder through the passage i' , so as to return the piston to its normal position at the forward end of the cylinder. This is accomplished owing to the fact that the area of the rear of the piston acted upon by the air is greater than that at the front.

The valve J has a spindle J' and a hand-wheel J². The valve has preferably a slight taper and is held in place by a screw-plug j^3 , between which and the valve is a spring j^4 . The pressure of air against the valve tends to counteract the pressure of the spring and to allow the valve to be readily turned; but the spring will always tend to keep the valve to its seat.

The machine is suspended from a yoke-frame M, attached to trunnions $m m$ on each side of the frame, as clearly shown in Fig. 3, although it may be supported by a suitable base when used in the fixed position and in some instances, when made in the smaller sizes, may be held in the hand.

The spindle D' can be removed from the cylinder for the replacement of the packing-

rings when necessary without dismantling the machine, so that the tight joint is always insured between the piston and the fixed spindle.

- 5 The position of rest of the plunger B' is regulated by a screw S, which is adapted to a screw-plug s in the end of the cylinder B, and between this screw-plug and a flange on the cylinder is a packing-ring, so as to keep
10 this joint always tight.

By simply adjusting the screw S the fluid in the cylinder B is displaced, and this screw can be utilized also to take up lost motion owing to leakage that may occur.

- 15 It will be seen that a machine built according to my invention can be operated by compressed air, steam, or other fluid under pressure, and I prefer to use in the cylinder B' and passages and in the cylinder of the piston
20 a liquid, such as oil and tallow or glycerin.

- By constructing the cylinder and its piston in the manner shown I am enabled to use the compressed air, by which I prefer to operate the device, in the most economical manner,
25 as the air which is used to move the plunger forward to compress the rivet is allowed to flow into the opposite end of the cylinder, so that the pressure at both ends of the cylinder is equalized, but the piston will be moved
30 back to its normal position, owing to the difference in area.

- In some instances the fixed spindle D', instead of being secured to the rear of the cylinder, may be secured to the frame, as shown
35 in Fig. 5, and the short connection made between it and the cylinder B without departing from the main features of my invention.

I claim as my invention—

1. The combination of the frame, its cylinder, a plunger adapted to the cylinder having a riveting-die, a tube for liquid, a compression-cylinder adapted to receive fluid under pressure, a piston in said cylinder and a cylinder carried by the piston and connected
40 with the tube, the area of the back of the piston being greater than the front, a valve having a communicating passage so that the air after compressing a rivet will pass into the opposite end of the cylinder so that the pis-

ton and the plunger will be moved back to the normal position, substantially as described.

2. The combination of a frame A, its cylinder B, a plunger B', a cylinder D at the back of the yoke-frame, a fixed plunger D' extending into the cylinder, a piston having a cylinder adapted to an opening in the frame and to the fixed plunger, said piston-cylinder communicating with the cylinder B through a passage, said passage containing liquid so that on the movement of the piston within its cylinder the plunger will be operated through the medium of the liquid, substantially as described.

3. The combination of the frame, the cylinder B, its piston B', a cylinder D secured to the rear of the frame and having a reduced extension, a plunger screwed into said extension and projecting into the cylinder and having a passage, a pipe forming communication between said passage and the cylinder B, a piston adapted to the cylinder D and having a central cylinder adapted to an opening in the frame and to the fixed plunger and communicating with the passage in the plunger, with valve mechanism controlling the flow of fluid into the cylinder D, substantially as described.

4. The combination of the yoke-frame having two arms a a' and a rear extension a^3 , a cylinder on the arm a , a plunger in said cylinder, a cylinder D secured to the rear of the frame and inclosing the extension a^3 , an opening in the extension, a piston F adapted to the cylinder and having a cylinder adapted to the opening in the extension, a hollow fixed plunger secured to the rear of the cylinder D and a tube communicating with the plunger and the cylinder B, and valve mechanism for controlling the movement of the piston F, substantially as described.

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

SAMUEL S. CASKEY.

Witnesses:

WILL. A. BARR,
JOS. H. KLEIN.