

No. 687,134.

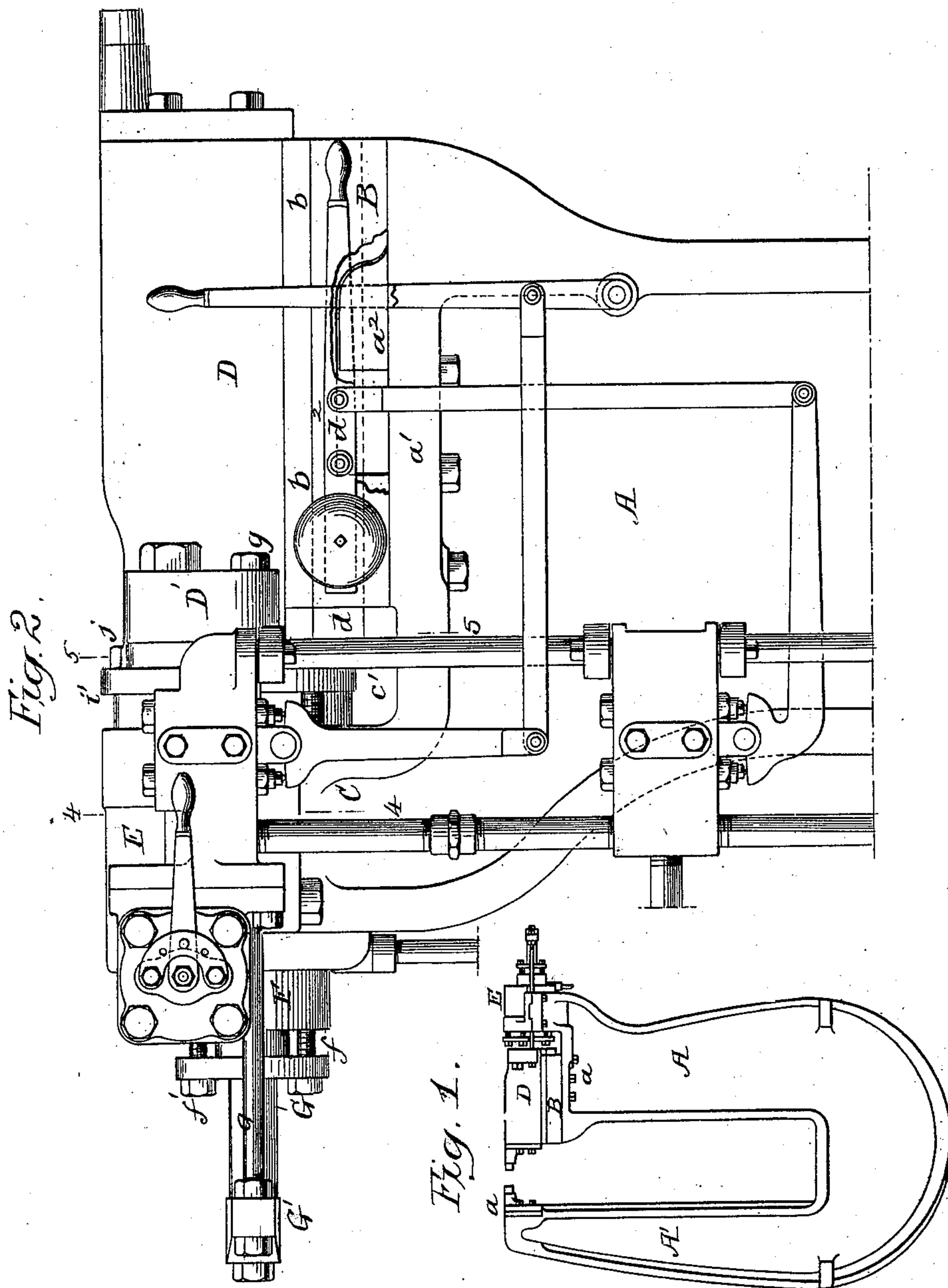
Patented Nov. 19, 1901.

W. H. DERBYSHIRE.
HYDRAULIC RIVETING MACHINE.

(Application filed July 26, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:-
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James C. Hayes.

Inventor:-
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by his Attorneys.
Howson & Howson

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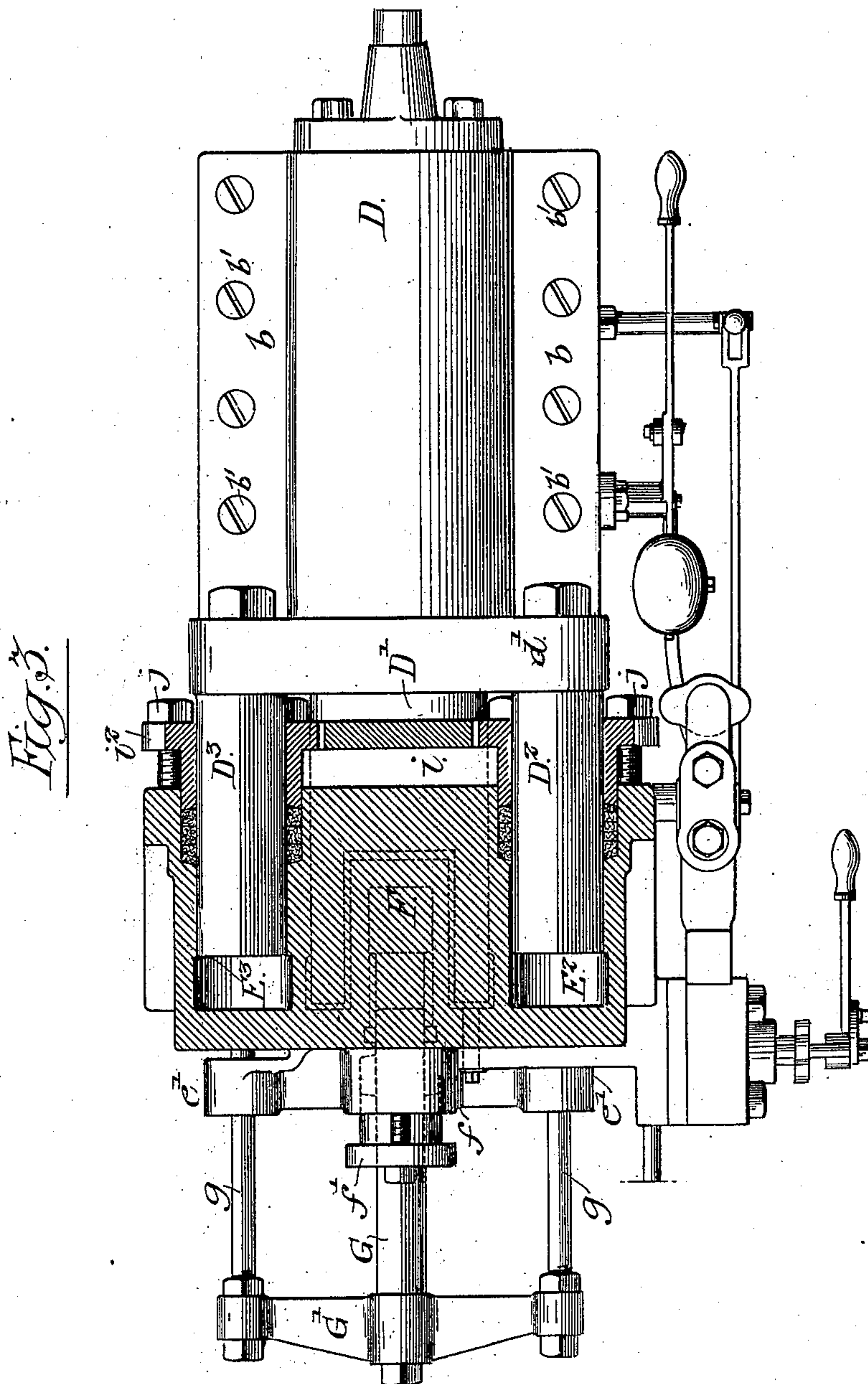
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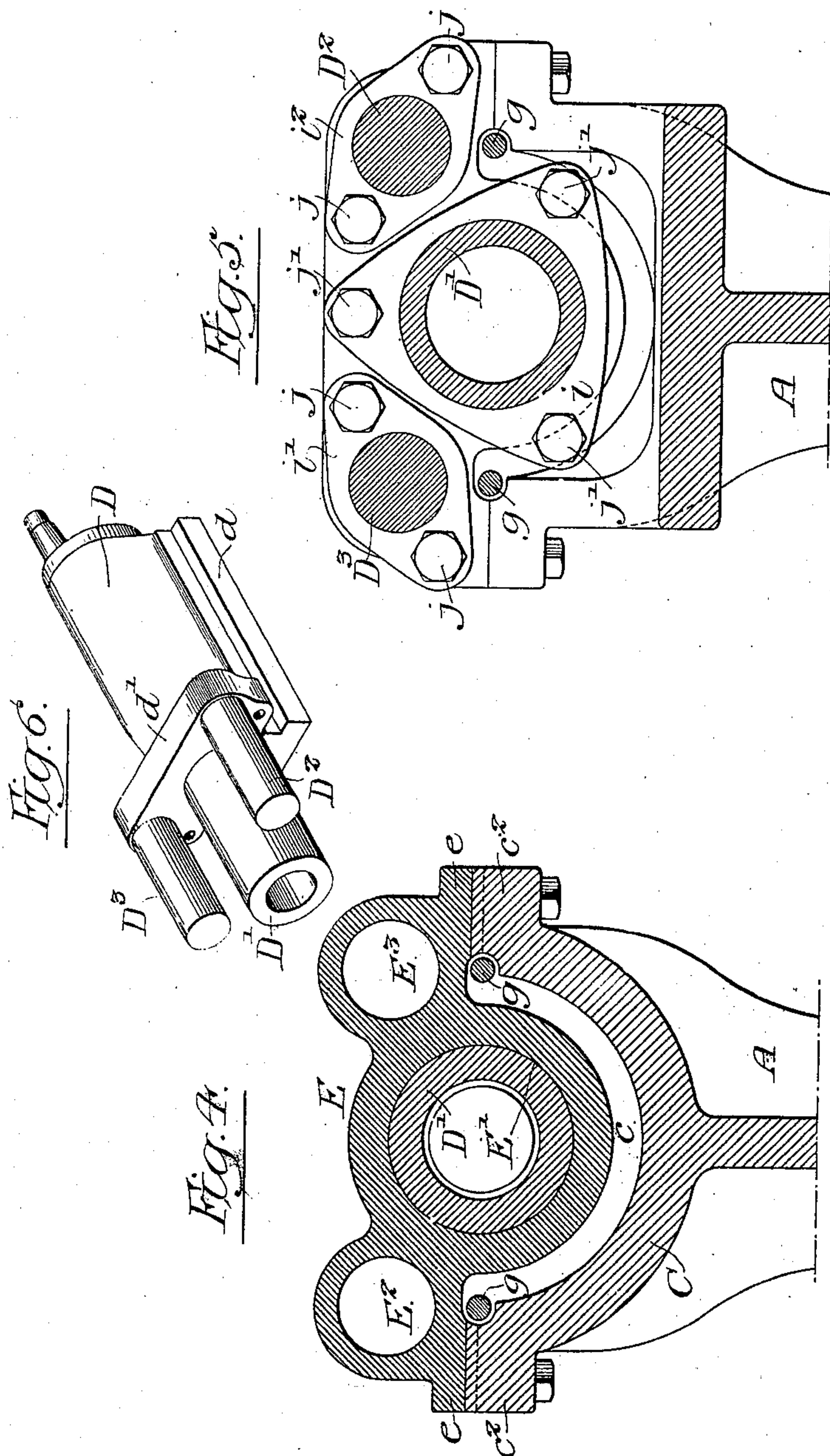
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

WILLIAM H. DERBYSHIRE, OF CHAMBERSBURG, PENNSYLVANIA.

HYDRAULIC RIVETING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 687,134, dated November 19, 1901.

Application filed July 26, 1899. Serial No. 725,174. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. DERBYSHIRE, a citizen of the United States, and a resident of Chambersburg, Pennsylvania, have
5 invented certain Improvements in Hydraulic Riveting-Machines, of which the following is a specification.

The object of my invention is to so construct a hydraulic riveting-machine that different pressures may be exerted on the riveting-head. This object I attain by arranging in the present instance three cylinders and providing the riveting-head with three plungers adapted to the cylinders, as fully
15 described hereinafter.

In the accompanying drawings, Figure 1 is a side view of sufficient of a hydraulic riveting-machine to illustrate my invention. Fig. 2 is an enlarged view of a portion of Fig. 1. Fig. 3 is a plan view of Fig. 2 with the two upper cylinders in section. Fig. 4 is a section on the line 4 4, Fig. 2. Fig. 5 is a section on the line 5 5, Fig. 2; and Fig. 6 is a detached perspective view of the riveting-head,
25 showing its plungers.

A is the frame of the riveter.

A' is the stake, carrying the fixed die *a*.

The upper end of the frame A has a seat *a'* for the base-plate B, on which the riveting-head D slides. The riveting-head has flanges *d* at each side, and plates *b* extend over the flanges and retain the riveting-head in position. Bolts *b'* pass through the plates *b* and B and into the frame A, thus rigidly securing the plates to the frame.
35

At the rear of the frame A is an extension C, formed as clearly shown in Fig. 4, having a recess *c*, in which rests the cylinder-casting E. Between the extension C and the base-plate B is a space *c'* of sufficient width to allow for the ready packing of the several cylinders from the outside without dismantling the machine. The cylinder-casting E has flanges *e*, which are bolted to the flanges *c*² on an extension C, thus securing the cylinder rigidly to the frame of the machine. The cylinder-casting has three cylinders E', E², and E³ formed therein. In the present instance the cylinder E' is a large cylinder, being twice the diameter of the cylinders E² E³. These
50 two cylinders are of the same diameter. Adapted to each of these cylinders, respec-

tively, are the plungers D', D², and D³ of the riveting-head D. It will be noticed in referring to Fig. 6 that the large plunger D' is hollow and is formed in this manner to allow it to pass the projecting portion of the return-cylinder F, also formed in the cylinder-casting E and shown by dotted lines in Fig. 3. A plunger G is adapted to this return-cylinder and passes through a stuffing-box *f* at the rear of the cylinder, and this stuffing-box is provided with a follower-ring *f'*, so arranged that access may be had to the packing from the rear of the machine. The plunger G is
60 connected to the cross-head G', which in turn is connected to the flange *d'* on the riveting-head D by rods *g g*, which are adapted to bearings *e'*, forming part of the cylinder-casting. The cylinder-casting as well as the frame of the machine is cut away to allow for the free movement of the rods *g g*, as clearly shown in Fig. 4.
70

Each of the cylinders is recessed at the forward end to form stuffing-boxes, and in these stuffing-boxes is arranged suitable packing, confined therein by flanged glands *i i' i²*, confined to the casting by bolts *j*. The flange of the central gland *i* is triangular in shape, and three bolts *j'* hold it in place, while the other glands *i' i²* for the small cylinders are formed somewhat in the shape of a diamond, with two bolts *j* confining them in position. Thus these rings will snugly fit the necessarily-limited space, yet any one or all
85 of the glands can be removed and the stuffing-boxes repacked.

In order to limit the movement of the riveting-head, I form on the casting A a projection *a²*, which extends through the base-plate B and into a recess *d²* in the under side of the riveting-head. If the riveting-head is moved too far in either direction, the end walls of the recess *d²* strike the projection *a²*, and thus the movement of the head is limited. By this means I get a very solid abutment without extra fitting.
95

Any suitable hydraulic valves may be used to direct the fluid into one, two, or three cylinders simultaneously, according to the work to be done by the riveter. If it is light work, then only the small cylinders need be used; if it is work requiring medium pressure, then the large cylinder is used, and if it is

work requiring heavy pressure then the three cylinders are used.

I do not in this application claim the combination in a riveting-machine of an arm 5 having two extensions, on one of which is carried a cylinder and on the other a riveting-head, with a plunger-section adapted to the cylinder and a recess or cavity in the cylinder, in which a packing is seated and 10 held in place by a removable ring located in the space between the two extensions of the arm, nor to such a construction in which a smaller cylinder with its operating-plunger is located within the larger cylinder on said 15 extension, as such constructions form the subject-matter of the first five claims of my Patent No. 656,097, granted August 14, 1900.

I have shown in the drawings suitable valve mechanism controlling the flow of 20 fluid to or from the cylinders. I have not described this mechanism in detail, as any suitable form of valve mechanism may be used.

I claim as my invention—

1. The combination in a riveting-machine, 25 of a frame, a casting mounted thereon having three cylinders in it, a slide on said frame having three pistons constructed to work in said cylinders, a stuffing-box in front of each cylinder, and a gland for each stuffing-box, 30 said glands being removable in a space between the cylinders and the slide, substantially as described.

2. The combination in a riveting-machine, of a frame, a cylinder-casting mounted on the 35 same, three cylinders formed in said casting, two of them being in a plane not passing through the long axis of the third cylinder, three plungers constructed to act in the cylinders, and a riveting head or slide con- 40 structed to carry said plungers and to be moved by them, substantially as described.

3. The combination in a riveting-machine, of a frame, a casting mounted thereon having 45 cylinders in it, a slide on said frame having pistons constructed to work in said cylinders, a stuffing-box in front of each cylinder and a gland for each stuffing-box, said glands for all the cylinders being removable in a space 50 between the cylinders and the slide, substantially as described.

4. The combination in a riveting-machine,

of a frame, a cylinder-casting mounted on the frame, three cylinders formed in said casting, two of them being above a horizontal plane 55 passing through the long axis of the other, three plungers adapted to the cylinders and carried by a riveting-head, stuffing-boxes and flanged glands therefor, the two upper glands being diamond-shaped and the lower gland 60 triangular, substantially as described.

5. The combination in a riveting-machine, of a frame, a cylinder-casting mounted on the frame, cylinders formed in the said casting, 65 two above a horizontal plane passing through the long axis of the third, spaces below the two upper cylinders, a slide with a cross-head having three pistons within the said cylinders, a rear cylinder-piston therefor, a cross-head to which the piston is secured, and 70 rods connecting the cross-head to the slide, said rods passing through the space below the upper cylinder, substantially as described.

6. The combination in a hydraulic riveting-machine, of a frame, a cylinder-casting on 75 said frame, four cylinders formed in said casting, three of said cylinders open at one end and forming the pressure-cylinders, the other cylinder open at the rear and forming the return-cylinder, a slide, plungers thereon entering the three pressure-cylinders, a piston 80 at the rear entering the return-cylinder, said piston being connected to the slide, substantially as described.

7. The combination in a hydraulic riveting-machine, of a frame, a cylinder-casting mount- 85 ed on said frame, and cylinders formed in said casting, with a slide having an integral cross-head from which project three plungers, one of these being a main plunger hollowed in the rear, a cylinder projecting into the main 90 cylinder, a return-piston in said cylinder, a cross-head and rods connecting said cross-head with the riveting-head, substantially as described.

In testimony whereof I have signed my 95 name to this specification in the presence of two subscribing witnesses.

WILLIAM H. DERBYSHIRE.

Witnesses:

G. W. ATHERTON,
NEWTON PHENIDE.