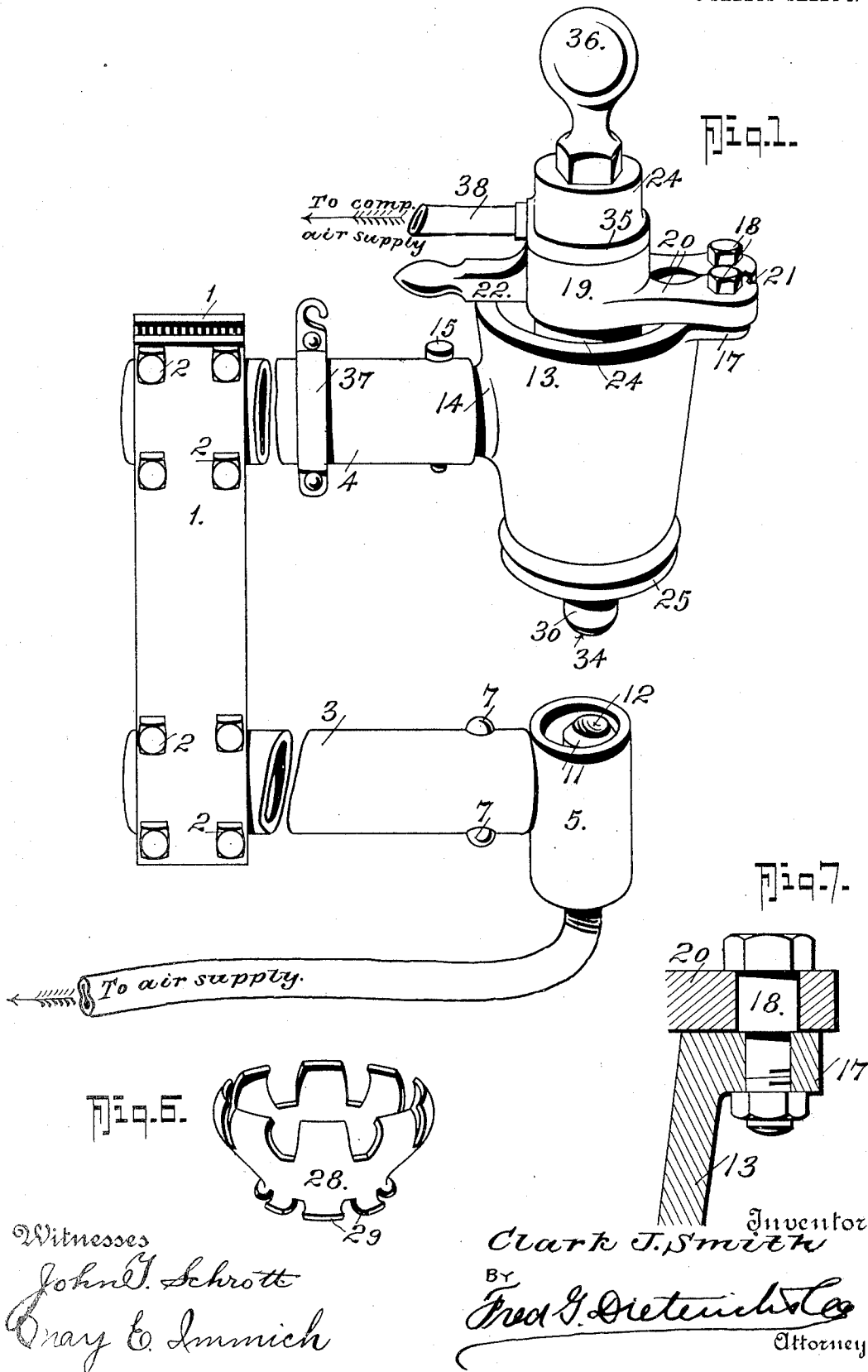


C. J. SMITH.
RIVETING AND CALKING MACHINE.
APPLICATION FILED OCT. 19, 1910.

1,003,012.

Patented Sept. 12, 1911.

3 SHEETS-SHEET 1.



Witnesses
John J. Schrott
Gray E. Immich

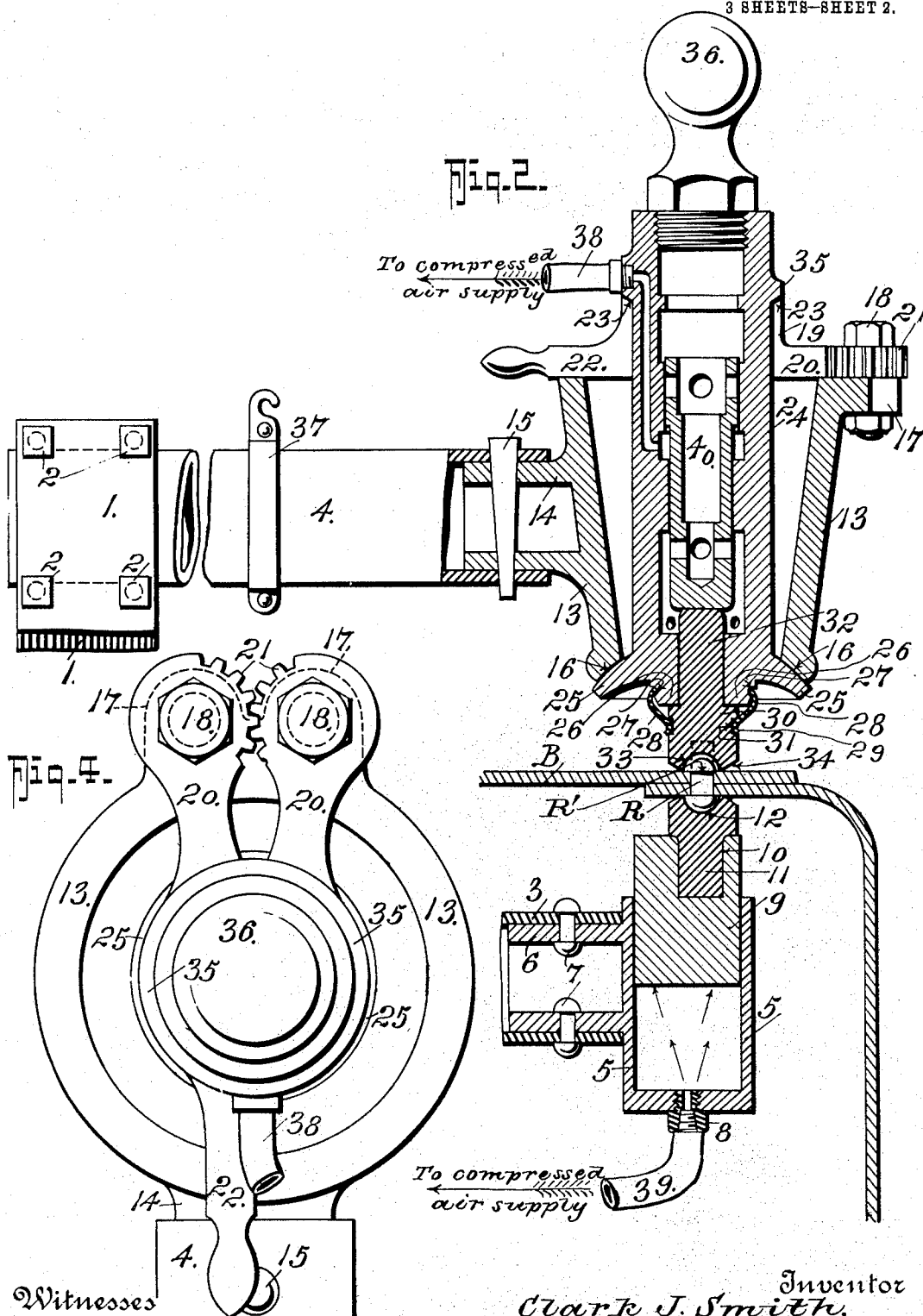
Inventor
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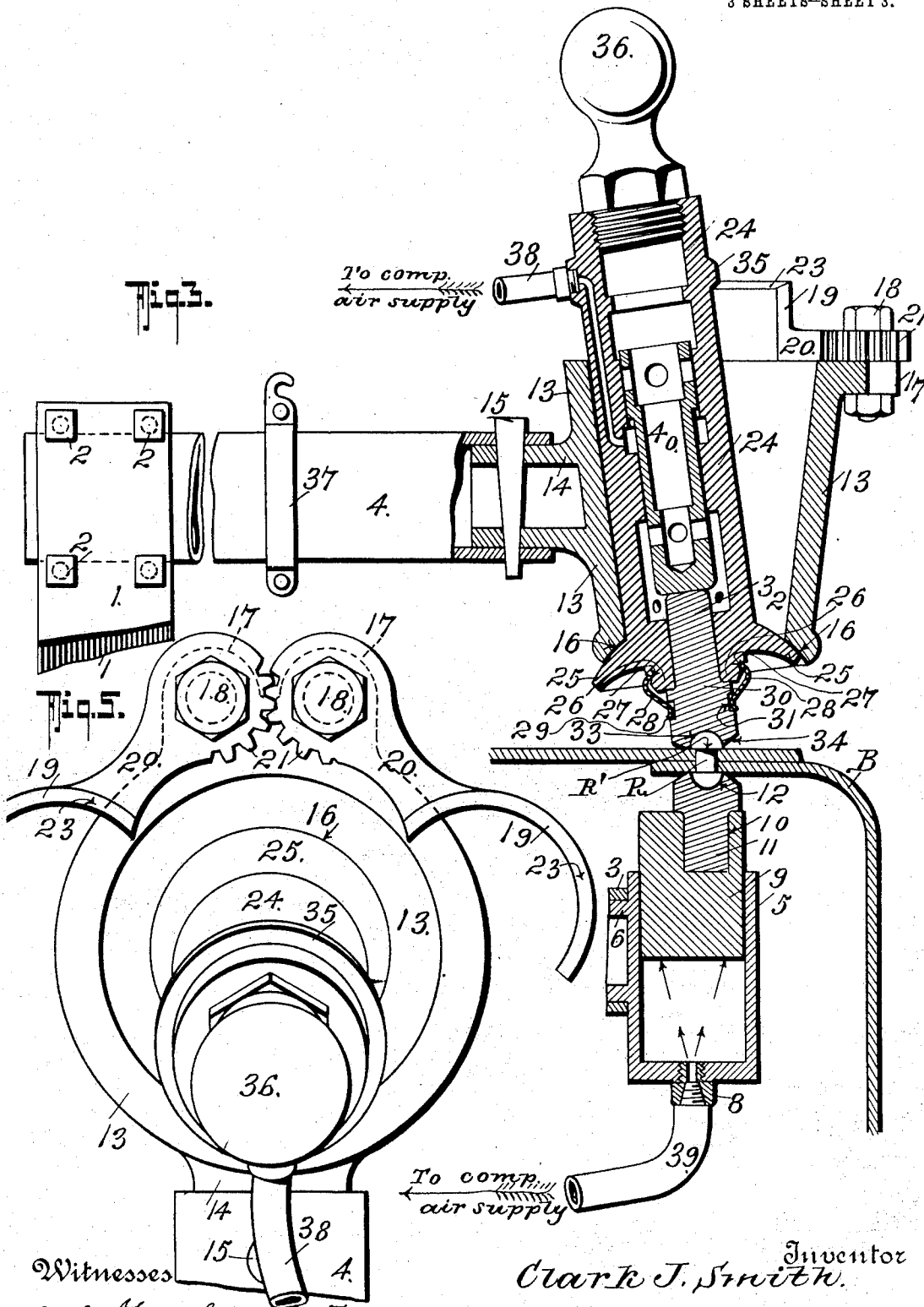
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

CLARK J. SMITH, OF OTTUMWA, IOWA, ASSIGNOR TO THE HARDSOGG WONDER DRILL COMPANY, OF OTTUMWA, IOWA.

RIVETING AND CALKING MACHINE.

1,003,012.

Specification of Letters Patent. Patented Sept. 12, 1911.

Application filed October 19, 1910. Serial No. 587,883.

To all whom it may concern:

Be it known that I, CLARK J. SMITH, residing at Ottumwa, in the county of Wapello and State of Iowa, have invented a new and Improved Riveting and Calking Machine, of which the following is a specification.

My invention is an improved machine that is particularly designed for use in riveting and calking boiler plates and the like, and which generically includes a supporting frame composed of an arm that may be projected into the boiler and carries an anvil die and its holder; a second arm that is connected to the first arm to lie parallel thereto, the second arm carrying a retaining hammer casing of frusto-conical form to which the riveting hammer engine projects, a clamp provided for holding the engine centrally in the retaining casing during the rivet upsetting operation, which clamp may be moved to release the engine so it may be given a gyratory movement in the casing to cause the rivet set or die to be driven to effect a tight calking of the rivet head.

In its more subordinate nature, the invention includes those novel details of construction, combination and arrangement of parts, all of which will be first fully described, then be specifically pointed out in the appended claims, and illustrated in the accompanying drawings, in which:—

Figure 1, is a perspective view of my invention. Fig. 2, is an enlarged central vertical longitudinal section of the same in use, parts being broken away. Fig. 3, is a similar view, the clamp being released and the hammer engine being swung away to its calking position. Fig. 4, is a top plan view of the machine, the parts being shown in the position shown in Fig. 2. Fig. 5, is a view similar to Fig. 4, the parts being in the position shown in Fig. 3. Fig. 6, is a detail perspective view of the retainer that holds the rivet set or die in place on the engine. Fig. 7, is a detail section showing one of the pivots for the clamping device.

Referring now to the accompanying drawings, in which like letters and numerals of reference indicate like parts in all of the figures, 1—1 designates a pair of plates which are bolted together by two sets of bolts 2 and between which the lower and upper pipes 3—4 respectively are clamped.

5 designates a tubular casing or cup in which a block 9 is mounted for longitudinal movement under the influence of pneumatic pressure, or its equivalent, the casing or cup 5 having an extension 6 to enter one end of the pipe 3 and it is riveted to such pipe by rivets 7, as shown in the drawings.

8 designates the inlet to the cup 5 through which the working agent that forces the block upwardly, is admitted.

The block 9 forms a die holder and is apertured at 10 to receive the shank of the die 11 whose head is cupped at 12 to conform to the contour of the head of the rivet R which joins the plates of the boiler B.

13 designates a retaining hammer casing of frusto-conical form, the end of lesser diameter being at the bottom and provided with a concaved seat 16. The casing 13 also has a tubular extension 14 to enter the pipe 4 to which it is pinned at 15, as indicated. The casing 13 at its upper end has a bracket-like extension 17 to receive the pivot bolts 18 on which the clamp sections 19 are mounted.

The clamp which serves to retain the engine 24 in its central position during the upsetting action on the rivet, is composed of a pair of half clamp members 19 each having a body 20 apertured to receive the pivots 18, the body 20 where the pivots 18 pass through being rounded and provided with toothed portions 21 to intermesh with one another so that the movement of one of the sections 19 by its handle extension 22 will effect a similar movement in the other section 19 to open or close the clamping device according as the handle 22 is moved in one direction, or the other.

The clamping device has its portion 19 upwardly projected and provided with a coniform seat 23 that coöperates with the correspondingly formed shoulder 35 of the hammer engine casing.

The hammer engine 24 may be of any approved construction, preferably, however, that shown in the drawings, and the casing of the engine is provided at its lower end with a spherical segment 25 that engages the concaved seat 16, the curvature of the seat 16 and the corresponding face of the segment 25 being struck from the center of curvature R' of the upset head of the rivet R, or in other words, being curved on the same center as is the cup 33 of the die

30 that forms said rivet head. The casing of the hammer engine is also provided at its lower end with an extension 26 having an annular groove 27 to receive the upper fingers of the gripper 28 whose lower fingers 29 enter the groove 31 on the head of the die 30. The die 30 has a shank 32 to project into the engine 24 and be impacted by its hammer piston, as clearly shown in the drawings, and as is usual in the art. The die 30 has its end face surrounding the cup portion 33, of coniform or beveled formation as at 34 for a purpose hereinafter more clearly understood.

The engine casing 24 is adapted to swing on the center R' when the clamp 19 is released to lie in engagement with the inner wall of the casing 13, as shown in Fig. 3 of the drawings, so that the casing may be rotated on the center R' in a gyratory manner to effect the calking action, as will be better understood later. The casing 24 is adapted to be moved by a handle 36 secured in its upper end.

The device is adapted to be suspended from an overhead crane, not shown, through the medium of an adjustable clamp 37 on the pipe 4, the clamp 37 being shiftable along the pipe to the center of balance of the device as a whole, so as to maintain the pipes 3-4 as nearly horizontal as practicable.

The working agent, which may be compressed air, steam or other suitable motive fluid, is admitted to the engine 24 through a feed pipe 38, as clearly shown in the drawings.

In operation the pipe 3 with its carried parts is projected into the boiler to engage the head of the rivet R, as shown in Fig. 2, while the die 30 is brought into engagement with the end of the rivet R to be upset, it being understood that the plunger block 9 permits bringing the parts in position, and it is itself held in place by the working agent that enters through the pipe 39.

The clamp sections 19 are closed onto the casing 24 and when working agent is admitted to the pipe 38 the hammer 40 is set into reciprocation in the usual manner to impact the die member 30 and cause it to upset the end of the rivet R until the parts assume the position shown in Fig. 2 of the drawings, after which the clamp 19 is released, the casing 24 is turned until it lies in contact with the inner wall of the casing after which a rotary motion is imparted to the engine 24 while it lies in contact with the casing 13, as shown in Fig. 3 of the drawings, thereby calking the rivet and insuring a tight joint.

From the foregoing description taken in connection with the accompanying drawings, it is thought the complete construc-

tion, operation and advantages of my invention will be readily understood by those skilled in the art to which the invention appertains.

What I claim is:

1. In an apparatus of the class described, a support including a pair of arms, an anvil mechanism carried by one of said arms and an upsetting and calking mechanism carried by the other arm, each of said mechanisms including rivet engaging dies, said upsetting and calking mechanism also including a hammer engine retaining casing, a hammer engine movably mounted in said casing, means for rigidly holding said engine in the axial line of said casing at times, said engine having a die receiving portion for one of said dies.

2. In an apparatus of the class described, a support including a pair of arms, an anvil mechanism carried by one of said arms and an upsetting and calking mechanism carried by the other arm, each of said mechanisms including rivet engaging dies, said upsetting and calking mechanism also including a hammer engine retaining casing, a hammer engine gyratorially movable in said casing, releasable means for rigidly holding said engine in the axial line of said casing, said engine having a die receiving portion for one of said dies.

3. In an apparatus of the class described, a support, a hollow casing having an internal chamber of frusto-conical form and provided at one end with a concaved seat, a releasable clamping mechanism mounted on the other end of said hollow casing, a hammer engine mounted within said hollow casing and having a portion to be gripped by said clamping mechanism, said hammer engine also having a portion provided with a convexed surface to engage said concaved seat whereby said engine will be rigidly held in position in said hollow casing when said clamping mechanism is in engagement with said engine, said engine including a die receiving portion, and means for retaining a die in said die receiving portion.

4. In an apparatus of the class described, a support, a hollow casing having an internal chamber of frusto-conical form and provided at one end with a concaved seat, a releasable clamping mechanism mounted on the other end of said hollow casing, a hammer engine mounted within said hollow casing and having a portion to be gripped by said clamping mechanism, said hammer engine also having a portion provided with a convexed surface to engage said concaved seat whereby said engine will be rigidly held in position in said hollow casing when said clamping mechanism is in engagement with said engine, said engine including a die receiving portion, means for retaining a die in said die receiving portion, a die in

said die receiving portion retained by said retaining means, said die having a rivet engaging recess in its outer end, and said concaved seat being curved on an arc having
5 as its center the center of curvature of said die recess.

5. In an apparatus of the class described, a support having a pair of arms, a cup like member carried by one arm, a block mounted
10 in said cup like member, means for admitting fluid under pressure to said cup-like member to force said block upwardly, said block having a die receiving aperture, a die held in said aperture, a hammer retaining
15 casing carried by said other arm, said hammer retaining casing being hollow and having the inner wall of frusto-conical form, a hammer engine mounted in said retaining casing, means carried by said retaining casing
20 ing for releasably engaging said engine to hold it in a definite position, said engine having a die receiving portion and a die held in said die receiving portion to cooperate with said first mentioned die.

25 6. In an apparatus of the class described, a support having a pair of arms, a cup like member carried by the one arm, a block mounted in said cup-like member, means for admitting fluid under pressure to said cup-
30 like member to force said block upwardly, said block having a die receiving aperture, a die held in said aperture, a hammer retaining casing carried by said other arm, said hammer retaining casing being hollow and
35 having the inner wall of frusto-conical form, a hammer engine mounted in said retaining casing, means carried by said retaining casing for releasably engaging said engine to hold it in a definite position, said
40 engine having a die receiving portion and a die held in said die receiving portion to cooperate with said first mentioned die; and means for releasing said engine holding means to permit said engine to be swung
45 over into engagement with the inner wall of said retaining casing.

7. In an apparatus of the class described, a support having a pair of arms, a cup-like member carried by the one arm, a block

mounted in said cup-like member, means for
50 admitting fluid under pressure to said cup-like member to force said block upwardly, said block having a die receiving aperture, a die held in said aperture, a hammer retaining casing carried by said other arm, said
55 hammer retaining casing being hollow and having an inner wall of frusto-conical form, a hammer engine mounted in said retaining casing, means carried by said retaining casing for engaging said engine to hold
60 it in a definite position, said engine having a die receiving portion and a die held in said die receiving portion to cooperate with said first mentioned die, said engine holding means including a seat on said retaining
65 casing to engage a part of said engine at one end, and a releasable clamping device on said retaining casing to engage said engine near its other end.

8. In an apparatus of the kind described,
70 a support having a pair of arms, a cup-like member carried by the one arm, a block mounted in said cup-like member, means for admitting fluid under pressure to said cup-like member to force said block up-
75 wardly, said block having a die receiving aperture, a die held in said aperture, a hammer retaining casing carried by said other arm, said hammer retaining casing being hollow and having an inner wall of frusto-
80 conical form, a hammer engine mounted in said retaining casing, means carried by said retaining casing for releasably engaging said engine to hold it in a definite position, said engine having a die receiving portion, a
85 die held in said die receiving portion to cooperate with said first mentioned die, an engine clamping device including a pair of half clamp sections pivoted to said retaining casing and having interengaged gear
90 portions whereby when one of said sections is moved on its pivot the other section will be correspondingly moved.

CLARK J. SMITH.

Witnesses:

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J. F. ADAMS.