

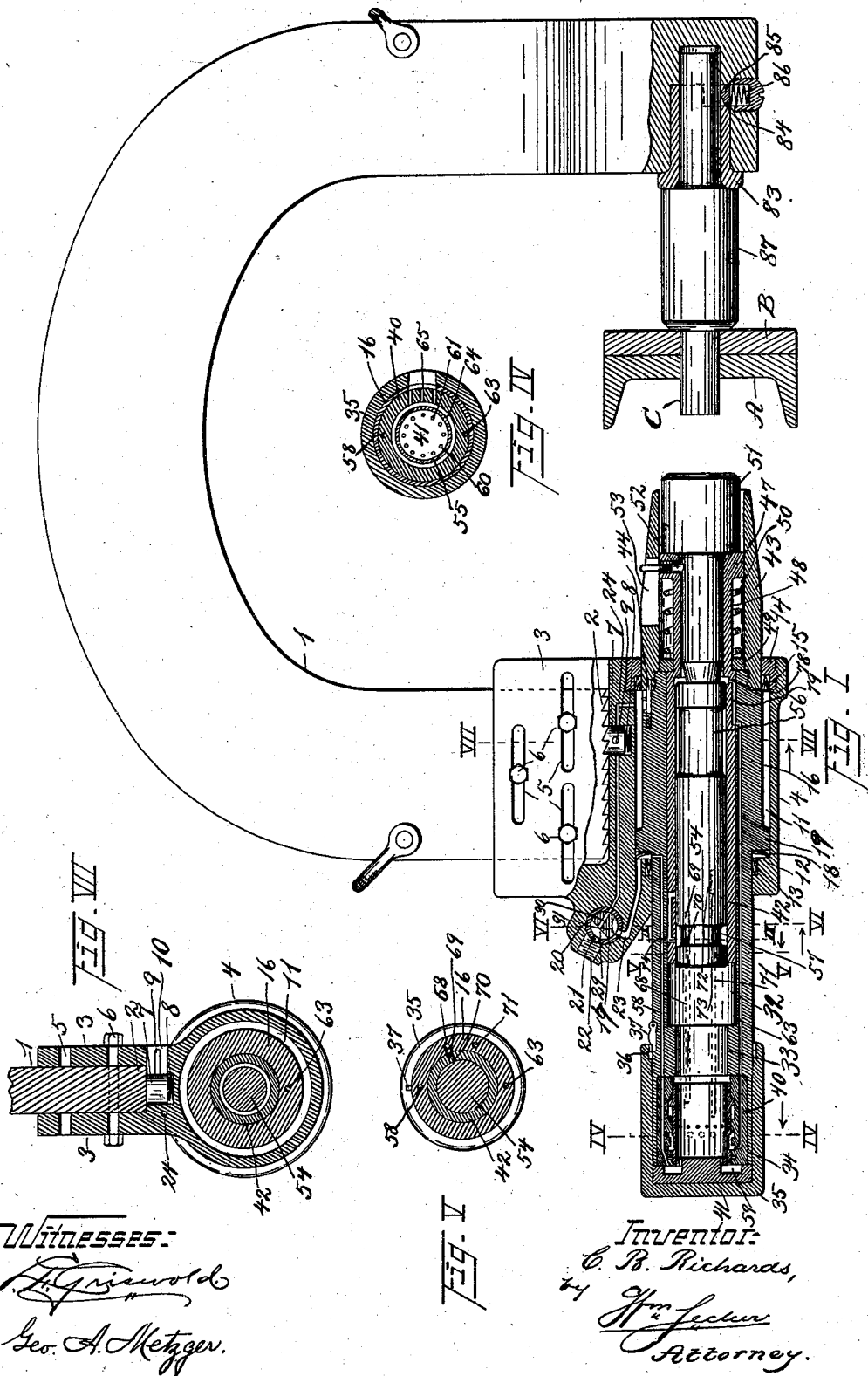
No. 695,415.

Patented Mar. 11, 1902.

C. B. RICHARDS.
PNEUMATIC RIVETER.
(Application filed Dec. 19, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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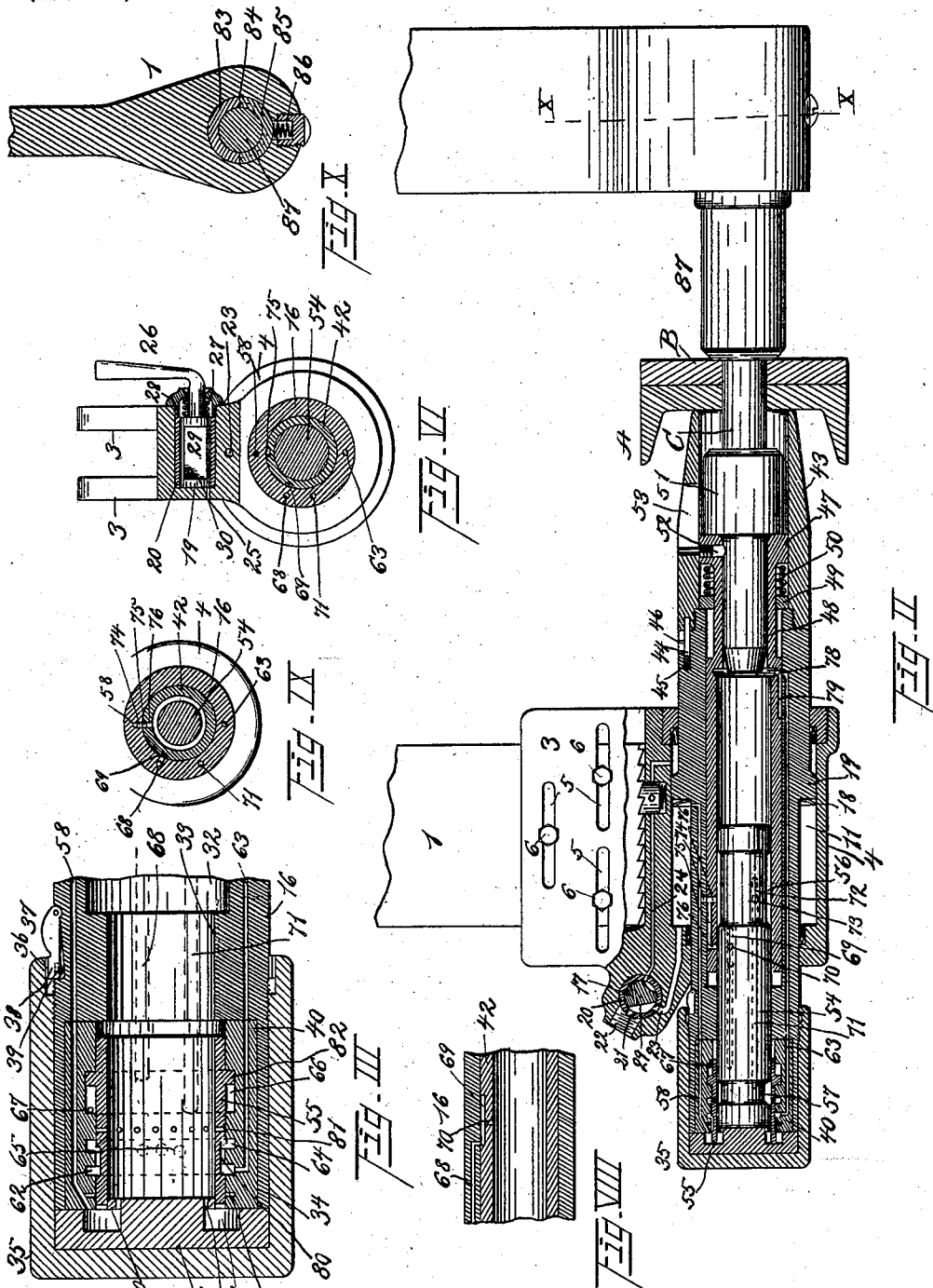
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Witnesses:

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by J. H. Fisher
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UNITED STATES PATENT OFFICE.

CHARLES B. RICHARDS, OF CLEVELAND, OHIO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE CLEVELAND PNEUMATIC TOOL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO, AND THE PHILADELPHIA PNEUMATIC TOOL COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PNEUMATIC RIVETER.

SPECIFICATION forming part of Letters Patent No. 695,415, dated March 11, 1902.

Application filed December 19, 1900. Serial No. 40,347. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. RICHARDS, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Pneumatic Riveters, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The annexed drawings and the following description set forth in detail one mechanical form embodying the invention, such detail construction being but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings, Figure I represents an axial section of my improved yoke-riveter, showing the parts in position before starting the operation of the riveter; Fig. II, an axial section of the riveter, showing the parts in position for operation and the yoke being broken and part of the same removed; Fig. III, an enlarged axial section of the rear end of the hammer; Fig. IV, a transverse section on the line IV IV in Fig. I and looking rearward; Fig. V, a similar section on the line V V in Fig. I looking rearward; Fig. VI, a section on the line VI VI in Fig. I looking forward; Fig. VII, a section on the line VII VII in Fig. I looking forward; Fig. VIII, a longitudinal sectional detail view of the barrel and barrel-tube, illustrating the live-air channel to the forward end of the valve-piston chamber and the recess and port communicating with said channel at the rear end of the barrel-tube; Fig. IX, a section on the line IX IX in Fig. I, and Fig. X a section on the line X X in Fig. II.

The yoke 1 of the riveter is of any suitable construction, being here illustrated as a flat arched metal plate or bar, but may be constructed in the form of an arched truss or in any other form suitable to the style of work in which the riveter is to be employed and to the amount of strength required. The lower

edge 2 of one leg of the yoke is formed with ratchet-teeth and is clamped between two lips 3, projecting from a cylinder 4. The lips are formed with longitudinal slots 5, through which pass clamping-bolts 6, which pass through holes in the yoke-leg, securing the cylinder to the same. A dog 7 engages the ratchet-teeth upon the edge of the yoke-leg and slides in a bore in the side of the cylinder between the lips. A spring 8 forces the dog into engagement with the ratchet-teeth, and a pin 9 projects from the dog and out through a slot 10 for the purpose of manipulating the dog. The cylinder has an axial bore 11, the rear end of which has an annular shoulder 12, internally rabbeted for a packing-ring 13, V-shaped in cross-section. The forward end of the cylinder has a similar internally-rabbeted annular shoulder formed by a ring 14, screwed into the end, and a similar packing-ring 15 is placed in the rabbet of said ring. A hammer-barrel 16 slides in the annular packed shoulders and has an annular piston 17, provided with a cup-packing 18, sliding in the cylinder-bore. A plug throttle-valve 19 fits in a valve-casing 20, transversely formed in a rearward projection from the cylinder to the rear of the lips, and said valve-casing has an inlet-opening 21 communicating with a socket 22, into which a hose or tube for the actuating fluid may be screwed or otherwise secured. A distributing-channel 23 extends from a port in the valve-casing to the rear end of the cylinder, and a distributing-channel 24 extends from a port in the valve-casing to the forward end of the cylinder. An exhaust-port 25 extends from one end of the valve-casing. The valve has a handle 26 for manipulating it and is held to its seat by a spring 27, bearing against the handle end and confined by a cap 28, screwed into the end of the valve-casing. The valve has a flat recess 29 in one side which does not extend completely to the ends of the valve, and said recess is of sufficient size to connect the inlet-opening and the rear distributing-port. A passage 30 extends from said recess through

the valve and may register with the forward distributing-port when the valve is turned to bring the recess out of connection with the forward distributing-port. A groove 31 or
 5 recess is formed in the side of the valve, extending the entire length of the same and may alternately register with the distributing-ports, registering with one port when live air is admitted to other port. Said recess is the exhaust-recess, as its end registers and communicates with the exhaust-port
 10 in the end of the valve-casing. When the flat live-air recess is turned to connect the inlet-port with the rear distributing-port, the live air will pass to the rear end of the cylinder and drive the hammer-barrel forward, the air in the forward end of the cylinder passing through the forward distributing-channel and exhaust-
 15 ing through the exhaust-recess and exhaust-port. When the valve is turned to bring the live-air passage in the valve to register with the forward distributing port and channel, the live air will pass through said channel and port to the forward end of the cylinder
 20 and force the hammer-barrel rearward, the air to the rear of the piston exhausting through the rear distributing channel and port and the exhaust-recess, which now registers with the forward port, and thence out at the exhaust
 25 at the end of the valve-casing. The hammer-barrel has a cylindrical bore 32, a narrow and short bore 33 near the rear end, and a wide bore 34 at the rear end. A cap-sleeve 35 is screwed over the rear end of the barrel and has internal ratchet-teeth 36 at its
 30 forward end engaged by a dog 37, pivoted in the hammer-barrel. Said dog consists of an arm pivoted at one end, formed with a bulge at its outer edge projecting beyond the recess in which the dog is pivoted, and a toothed
 35 end 38 engaging the ratchet-teeth. A spring 39 bears against the dog and holds it in engagement with the ratchet. The dog may be disengaged by pressing inward against its
 40 bulged edge. A tubular valve-block 40 is fitted within the large rear bore in the breech of the hammer-barrel, and a cap 41 bears against the rear end of said valve-block and of the hammer-barrel and is held in place by
 45 the cap-sleeve. A barrel-tube 42 slides within the bore of the barrel and has the same interior diameter as the narrow bore of the barrel. A nose-piece 43 is screwed upon the outer
 50 end of the barrel, and a bolt 44 slides in the wall of the barrel to engage a hole in the inner end of said nose-piece and hold the latter from turning. The bolt has a spring 45, which
 55 forces it into the hole, and has a pin 46 projecting and sliding in a slot in the barrel, by means of which pin the bolt may be withdrawn. The interior bore of the nose-piece is
 60 of a slightly-larger diameter than the bore of the barrel, and an annular enlargement 47 or head upon the outer end of a contracted tool-nose or tool-socket 48, formed at the outer end
 65 of the barrel-tube, slides in said bore. An annular stop is formed at the rear of the nose-

piece-bore by a ring 49, secured against the end of the barrel. A spring 50 is coiled around the contracted tool-socket and bears against
 70 the head of the same and against the annular shoulder 49, forcing the barrel-tube and tool-socket forward. The shank of a button-set 51 fits in the socket and is held by a spring-bolt 52, engaging a notch in the shank and
 75 sliding in the head of the tool-socket. The end of the spring-bolt projects into and has longitudinal play in a slot 53 in the nose-piece. The contracted tool-socket fits and slides in the annular shoulder. A plunger 54 slides
 80 within the barrel-tube, the contracted portion of the barrel-bore, and through a tubular valve 55 in the valve-block. Said plunger has a circumferential channel 56 at its forward end and a circumferential channel 57
 85 at its rear end. A live-air-inlet channel 58 has its inlet-opening through the wall of the hammer-barrel immediately to the rear of the piston upon the same and extends longitudinally through the wall of the barrel and
 90 valve-block to an annular channel 59 in the front face of the cap against the valve-block. Said channel has an overhanging flange 60 from the center of the cap, which flange has an annular series of holes 61. The tubular
 95 valve has a snug fit between the valve-block bore and said flange, so that it may cut off or open communication between the live-air channel and the annular port formed by the holes in the flange when moved rearward or
 100 forward, respectively, as shown in Figs. II and I. The interior of the valve-block has a narrow annular port 61 immediately at its rear end, which port communicates with the inlet-channel. Adjoining said annular port
 105 is an annular port 62, which communicates with the forward end of the barrel-bore by means of a distributing-channel 63, longitudinally extending through the wall of the valve-block and barrel from the annular port
 110 to near the forward end of the barrel. An annular port 64 adjoins said latter port and has one or more exhaust-openings 65 through the walls of the valve-block, barrel, and cap-sleeve. An annular chamber 66 is formed
 115 near the forward end of the valve-block and has two permanently-open ports 67, one at each end. A live-air-distributing channel 68 leads from the forward end of the chamber through the wall of the valve-block
 120 and barrel to a point toward the middle of the barrel, where it opens inward into the bore of the barrel. The barrel-tube is formed at that point with a longitudinal recess 69, which is of sufficient length to communicate
 125 with the port of said channel for the entire longitudinal play of the barrel-tube, and said recess has a port 70 at its middle which opens into the interior of the tube. A similar live-air-distributing channel 71 leads from
 130 the rear end of the chamber to a point forward of the terminal of the last-mentioned channel, and the barrel-tube has a longitudinal recess 72 similar to the recess 69, regis-

tering with the port of this latter channel and formed with a port 73 at its middle opening into the interior of the tube forward of the port 70. A port 74 opens into the barrel-bore from the live-air-supply channel, and a longitudinal recess 75 in the exterior of the barrel-tube registers with said port for the entire longitudinal play of the barrel-tube and has a port 76 at its rear end into the interior of the tube and registering with the rear port 70 and a port 77 at its forward end registering with the forward port 73. The barrel-tube has a port 78 at its forward end opening inward from the forward end of a longitudinal recess 79 in the exterior of the tube, which recess communicates for the entire longitudinal play of the barrel-tube with the port of the forward distributing-channel 63. The barrel-tube is kept from turning by means of the end of the spring-bolt, which holds the button-set and which slides in the slot 53 in the nosepiece, so that the longitudinal recesses in the exterior of the tube may be kept registering with their respective ports in the bore of the barrel. The tubular shell-valve 55 has play in the bore of the valve-block and has its interior bore of the same diameter as the narrow bore of the barrel and the bore of the barrel-tube. Said valve has an annular circumferential channel 80, which will connect the live-air port and the port to the forward distributing-channel when the valve is thrown rearward to cut off the channel in the valve-block cap and which will connect said latter port and the annular exhaust-port when the valve is thrown forward. The valve has an annular port through its middle formed by an annular series of holes 81, which may register with the exhaust-port of the valve-block when the valve is thrown rearward. An annular piston 82 is formed upon the valve to play within the annular piston-chamber 66 in the valve-block. A tool-socket 83 is secured in the other leg of the yoke directly opposite to the hammer, and the inner end of said tool-socket has a segmental portion cut away at 84, into which a correspondingly-shaped dog 85, having an angular inner edge, fits. Said dog is forced inward by a spring 86. A button-set 87 has its shank inserted into the socket and is prevented from dropping out of the same by the dog, which will be tilted and jam its edge against the shank, binding against the same if the button-set should start sliding outward. The faces of the button-sets are suitably recessed to correspond to the shape of the head of the rivet and of the head to be formed upon the rivet. The holder-on button-set cannot be removed from its socket by a straight pull upon the same, but can be removed by twisting it within the socket, and thus releasing it from the engagement of the angular edge of the segmental dog.

In practice the riveter is suitably supported or suspended to be brought to the work, and the yoke is brought in position to straddle the work, so as to bring the "holder-on" button-

set against the head of the rivet, as shown in Fig. I of the drawings, in which a channel-beam A and a plain bar B are disclosed as placed together face to face to be riveted together by a rivet C. The holder-on button-set is brought to bear against the head of the rivet, holding it in the rivet-holes, and air is admitted through the throttle-valve. As the air enters the cylinder it forces the hammer toward the rivet, acting against the rear face of the piston upon the hammer, and the nose-piece of the hammer will be forced against the face of the work, drawing the holder-on toward it and drawing and holding the rivet with its head close against the face of the beam. When the end of the rivet engages the button-set of the hammer, the button-set and the barrel-tube will be forced back against the spring. As air is admitted into the cylinder the air will pass from the latter through the inlet-channel and into the hammer, which will start operating, causing the reciprocating plunger to strike the end of the rivet, upsetting the same and forming the head. As the rivet is tightly held between the holder-on button-set and the beams clamped by the nose-piece of the hammer, the rivet cannot be driven back in its hole. As the end of the rivet becomes upset and the head is formed the hammer button-set and the barrel-tube will gradually move forward, following the longitudinal reduction of the rivet. The live air entering through the inlet-channel will pass to the rear of the hammer and will pass through the channel in the valve-block cap, and the perforations in the flange of the same back of the plunger driving the latter forward, as shown in Fig. I. When the plunger arrives at the forward end of the stroke, it strikes the shank of the button-set and upsets the rivet. At the end of the forward stroke of the plunger the rear channel in the same brings the rear live-air port in the rear portion of the barrel-tube and the rear port in the barrel-tube which communicates with the forward end of the valve-piston chamber into communication, causing the live air thus conducted to force the valve-piston and the valve rearward, closing the channel in the valve-block cap and bringing the annular channel in the valve to register with the annular inlet-port and the port communicating with the forward end of the barrel and barrel-tube, distributing the live air to that end to drive the plunger back. The rearward throw of the valve brings the annular exhaust-port in the same to register with the exhaust-port in the valve-block, so that the air behind the plunger may exhaust as the plunger moves back. As the exhaust-port of the valve is a distance from the end, the exhaust will be cut off before the plunger arrives at the end of its back stroke, so that the plunger will be cushioned by the air inclosed at the rear end of the hammer. When the plunger arrives at the end of its back stroke, the forward channel of the plunger will bring the forward live-air

port in the rear end of the barrel-tube and the forward port in the barrel-tube, which communicates with the rear end of the valve-piston chamber, into communication, causing the live air thus conducted to force the valve-piston and valve forward, opening the channel in the valve-block cap and bringing the port communicating with the forward end of the barrel and barrel-tube into communication through the annular channel in the valve with the exhaust-port. This will cause live-air inlet to the rear of the plunger and exhaust at the front of the same, driving the plunger forward to deliver its blow upon the button-set, and thus upon the rivet. When the rivet has been fully upset and headed, the throttle-valve is turned to connect the forward end of the cylinder to the live air and the rear end to the exhaust, when the hammer is moved back away from the work, and the riveter may be placed in position upon another rivet, when the operation is repeated. The slotted lips and the bolts passing through the slots and through the leg of the yoke, together with the ratchet-teeth and dog, admit of the cylinder being adjusted at a greater or less distance from the holder-on, according to the thickness of the work which is to be straddled by the riveter, this adjustment being auxiliary to the adjustment afforded by the hammer sliding in the cylinder. As the work is tightly clamped between the nose-piece of the hammer and the holder-on before the hammer begins to upset the rivet, the rivet will not be liable to be knocked out by the blows of the hammer, such as is liable to happen in greater or less degree if the button-set of the hammer were directly opposed to act upon the rivet without the specific means outside of the button-set for holding the holder-on tightly against the head of the rivet. The nosepiece bearing against the work around and at the side of the rivet acts as a support and guide for the hammer, which will be equally useful in a hand-riveter without the yoke, as in a yoke-riveter, and this construction is made possible by the telescoping feature of the hammer-barrel, which permits the plunger-cylinder, with the tool-socket and button-set, to be contracted when first placed against the rivet and to expand and elongate as the rivet is upset, while the tool is tightly and squarely held against the work. The nosepiece may be more or less reduced or cut away and shaped to suit the positions in which the riveter is to be employed and the surface of the work against which it is to bear to clamp the work between itself and the holder-on. The construction of the barrel-tube sliding in the barrel and having the longitudinal recesses which make permanent connections between the ports in the tube and the channels in the barrel provides for this telescopic contraction and expansion. The valve mechanism and the plunger are accessible without removing the hammer from the cylinder by removing the cap-sleeve,

which closes the breech of the barrel and retains the parts in position. The hammer may be removed from the cylinder by unscrewing the ring which forms the forward end of the cylinder and sliding the hammer out through the open end of the cylinder, the cap-sleeve having previously been removed. The barrel-sleeve and tool-socket are accessible by removing the nosepiece.

Other modes of applying the principle of my invention may be employed for the mode herein explained. Change may therefore be made as regards the mechanism thus disclosed, provided the principles of construction set forth respectively in the following claims are employed.

I therefore particularly point out and distinctly claim as my invention—

1. The combination of a suitably-supported cylinder having openings at both ends, a fluid-actuated hammer having a sliding fit in the end openings of said cylinder and having a piston around it fitted to slide in the cylinder, and means for controlling admission and exhaust of the actuating fluid into and out of said cylinder, substantially as set forth.

2. The combination of a suitably-supported cylinder, a fluid-actuated hammer within such cylinder and provided with a piston fitted to slide within the same, and means for admitting the actuating fluid into said cylinder at either side of the piston for moving the hammer in either direction, substantially as set forth.

3. The combination of a suitably-supported cylinder, a fluid-actuated hammer within such cylinder and provided with a piston fitted to slide within the same, means for admitting the actuating fluid into said cylinder at either side of the piston for moving the hammer in either direction, and a connection for the actuating fluid from behind the piston to the hammer for admitting such fluid to operate the hammer after the latter has been moved forward by admission of the fluid behind the piston, substantially as set forth.

4. The combination of a suitably-supported cylinder, a fluid-actuated hammer within said cylinder and provided with a piston fitted to slide within the same and having a passage for the actuating fluid opening into the cylinder behind the piston, and means for controlling the admission of the actuating fluid into the cylinder at either side of the piston for moving the hammer in either direction, substantially as set forth.

5. The combination of a suitably-supported cylinder, a fluid-actuated hammer within such cylinder and provided with a piston fitted to slide within the same and having a passage for the actuating fluid opening into the cylinder behind the piston, distributing-passages for the fluid to the ends of the cylinder, and a valve formed with live-air passages adapted to alternately register with either of said distributing-passages and exhaust-passage adapted to alternately register with the live-

air passages and with the distributing-passages, substantially as set forth.

6. The combination of a fluid-actuated hammer-barrel, a tool-socket having longitudinal telescoping movement in the outer end of said barrel, and a plunger reciprocating within said barrel, substantially as set forth.

7. The combination of a fluid-actuated hammer-barrel having distributing-ports, a tube having longitudinal telescoping movement within said barrel and having a tool-socket at its end and a distributing-port at said socket communicating with the corresponding distributing-port in the barrel, and a plunger reciprocating within said barrel and tube, substantially as set forth.

8. The combination with a fluid-actuated hammer-barrel having a distributing-port in its bore and a tube telescoping within said barrel and having a distributing-port and formed with a tool-socket at its outer end, one of said elements having a longitudinal recess formed at the distributing-port and registering with the other port to form communication between said ports at all parts of the telescoping play, of a plunger reciprocating within said barrel and tube, substantially as set forth.

9. The combination of a fluid-actuated hammer-barrel provided with a nosepiece at its outer end adapted to bear against the surface of the work to be acted upon, a tool-socket telescoping in the outer end of the barrel, and a plunger reciprocating in said barrel, substantially as set forth.

10. The combination of a fluid-actuated hammer-barrel provided with a nosepiece at its outer end adapted to bear against the surface of the work to be acted upon and having distributing-ports, a tube telescoping within said barrel and having a tool-socket at its end and a distributing-port at said socket communicating with the corresponding distributing-port in the barrel, and a plunger reciprocating within said barrel and tube, substantially as set forth.

11. The combination of a yoke, a cylinder on one leg of said yoke, a holder-on on the other leg of the yoke and opposed to the cylinder, a fluid-actuated hammer fitted to slide within the cylinder and provided with a nosepiece upon its end adapted to bear against the work in opposition to the holder-on, means for admitting the actuating fluid behind the hammer to slide the same forward in the cylinder, and a tool longitudinally movable within the outer end of the hammer-barrel, substantially as set forth.

12. The combination of a yoke, a cylinder on one leg of said yoke, a holder-on on the other leg of the yoke and opposed to the cylinder, a barrel fitted to slide within the cylinder and provided with a nosepiece upon its end adapted to bear against the work in opposition to the holder-on, means for admitting the actuating fluid behind the barrel to slide the same forward in the cylinder, a bar-

rel-tube telescoping within the barrel and provided with a tool-socket at its outer end, a plunger reciprocating within said barrel-tube, and means for distributing the actuating fluid to reciprocate said plunger, substantially as set forth.

13. The combination of a fluid-actuated hammer-barrel having distributing-ports for the actuating fluid, a tube telescoping within said barrel and having a tool-socket at its outer end and formed with distributing-ports having permanent connection to the ports in the barrel through longitudinal recesses registering with the ports for the entire play of the tube, a valve controlling the admission and exhaust through the distributing-ports and controlled by such fluid through distributing-ports in the tube and barrel, and a plunger reciprocating within the tube and barrel and provided with valve-controlling fluid-channels around it for admitting the actuating fluid to the valve and registering with ports for said fluid in the tube, substantially as set forth.

14. The combination of a hammer-barrel having an axial bore and provided with a live-air-inlet channel extending rearward in its wall and formed with a port opening into the bore near its middle, a distributing-channel in the wall and having a port near the outer end, and two rearwardly-extending valve-controlling channels having ports near the middle of the bore; a barrel-tube telescoping within the bore of the barrel and having a tool-socket at its outer end and provided with a port at its outer end opening into a longitudinal recess in the outer side registering with the distributing-port in the barrel, a longitudinal recess in its outer side registering with the inlet-port and having a port into the tube at each end, and ports registering with said latter ports and opening into longitudinal recesses in the outer side registering with the ports of the rearwardly-extending valve-controlling channels; a valve-chamber having all of the channels extending into it; a valve in said chamber controlling and controlled by said channels, and a plunger in the barrel-tube having two annular channels around it which will connect the live-air ports in the tube with the registering ports at the extremes of the throw of the plunger, substantially as set forth.

15. In a pneumatic hammer, the combination of a tubular valve-block having a live-air-inlet channel extending through its wall and opening at its rear end and formed with an annular live-air port near the rear end and communicating with the live-air channel and an adjoining annular distributing-port and with an annular exhaust-port and an annular piston-chamber having permanently open exhaust-ports at its ends and controlled inlet-ports, a cap against the rear end of the valve-block and formed with an annular inlet-channel and a flange around the center formed with an annular inlet-port, and

- a tubular valve having play within the chamber of the block and having its rear end sliding between the flange and the block into the annular channel in the cap and formed with an annular distributing-channel near its rear end and with an annular series of exhaust-holes at its middle and with a piston sliding in the piston-chamber, substantially as set forth.
- 10 16. In a pneumatic hammer, the combination of a tubular valve-block, a cap bearing against the end of said block and having an annular inlet-channel and an annular flange overhanging the channel from the center of the cap and formed with an annular port, and
15 a tubular valve having its end sliding between the bore of the valve-block and the flange into the channel, substantially as set forth.
- 20 17. The combination of a yoke having the edge of one leg formed with ratchet-teeth, a riveter-cylinder formed with longitudinally-slotted lips between which said leg fits, a dog engaging the ratchet-teeth and movable in
25 the bottom of the space between the lips, and fastening-bolts passed through the slots in the lips and the leg of the yoke, substantially as set forth.
18. The combination of a tool-socket having
30 a segmental slot, a segmental dog fitting in said slot and having an angular inner edge, a spring forcing said dog inward, and a tool having its shank inserted into the socket and engaged by the angular edge of the dog, sub-
35 stantially as set forth.
19. The combination of a casing, a yoke connected therewith, a pneumatic tool mounted in said casing and means operated by fluid-pressure for moving said tool toward and away from the work, substantially as set forth.
20. The combination of a cylinder, a hammer-barrel contained in said cylinder, a plunger in said barrel, and means for admitting fluid-pressure to opposite parts of said cylinder so as to move said barrel in either direction.
21. The combination of a cylinder, a barrel in said cylinder and having differential-pressure areas, a plunger in said barrel, and means for admitting fluid-pressure to said differential-pressure areas.
22. The combination of a cylinder, a barrel in said cylinder and having differential-pressure areas, a plunger in said barrel, and means for admitting and exhausting fluid-pressure to said differential-pressure areas.
23. The combination of a cylinder, a barrel within said cylinder provided with a piston on a suitable portion thereof, and means for admitting the actuating fluid into said cylinder at either side of said piston for moving the latter in either direction.
- In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 27th day of March, A. D. 1900.
- CHARLES B. RICHARDS.
- Witnesses:
WM. SECHER,
MARGARET F. SECHER.

It is hereby certified that one of the assignees in Letters Patent No. 695,415, granted March 11, 1902, upon the application of Charles B. Richards, of Cleveland, Ohio, for an improvement in "Pneumatic Riveters," should have been described and specified as *The Philadelphia Pneumatic Tool Company, of Philadelphia, Pennsylvania, a corporation of New Jersey*, instead of "The Philadelphia Pneumatic Tool Company, Philadelphia, a corporation of Pennsylvania, Pennsylvania;" and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of May, A. D., 1902.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.