No. 841,388.

PATENTED JAN. 15, 1907.

J. GAPP.

PIPE EXPANDING TOOL.

APPLICATION FILED JAN. 23, 1906.

2 SHEETS—SHEET 1.

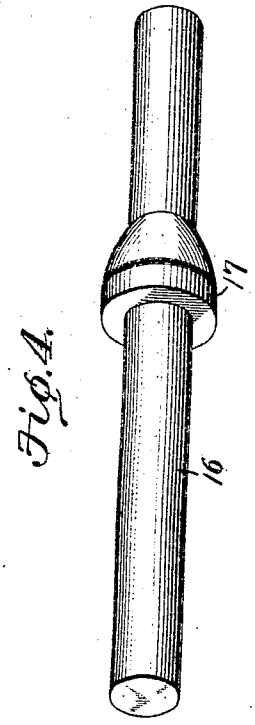


Fig. 4.

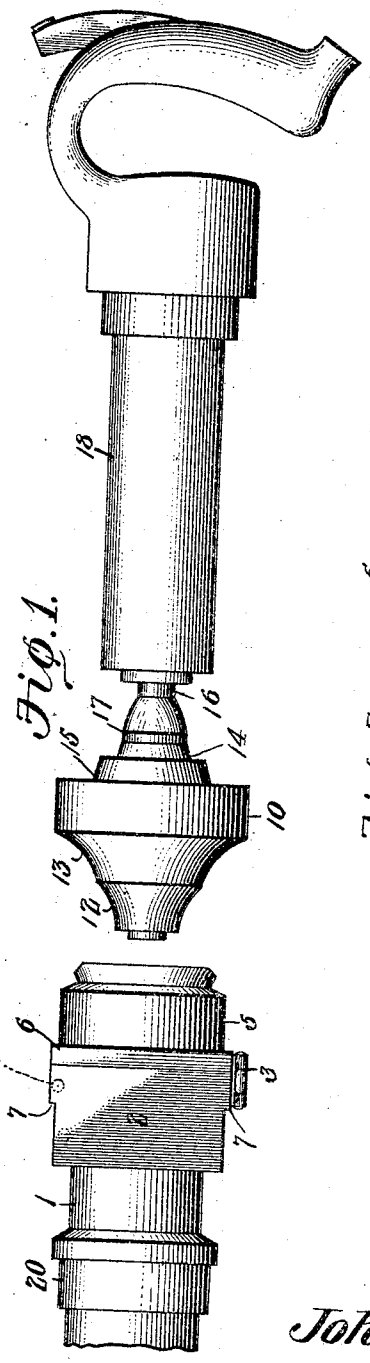


Fig. 1.

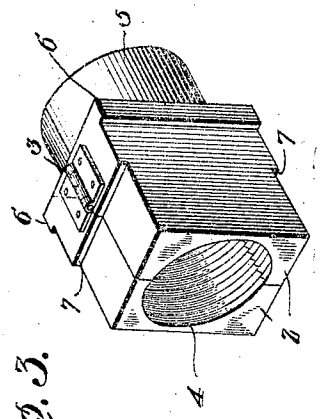


Fig. 3.

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No. 841,388. PATENTED JAN. 15, 1907.

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PIPE EXPANDING TOOL.

APPLICATION FILED JAN. 23, 1903.

2 SHEETS—SHEET 2.

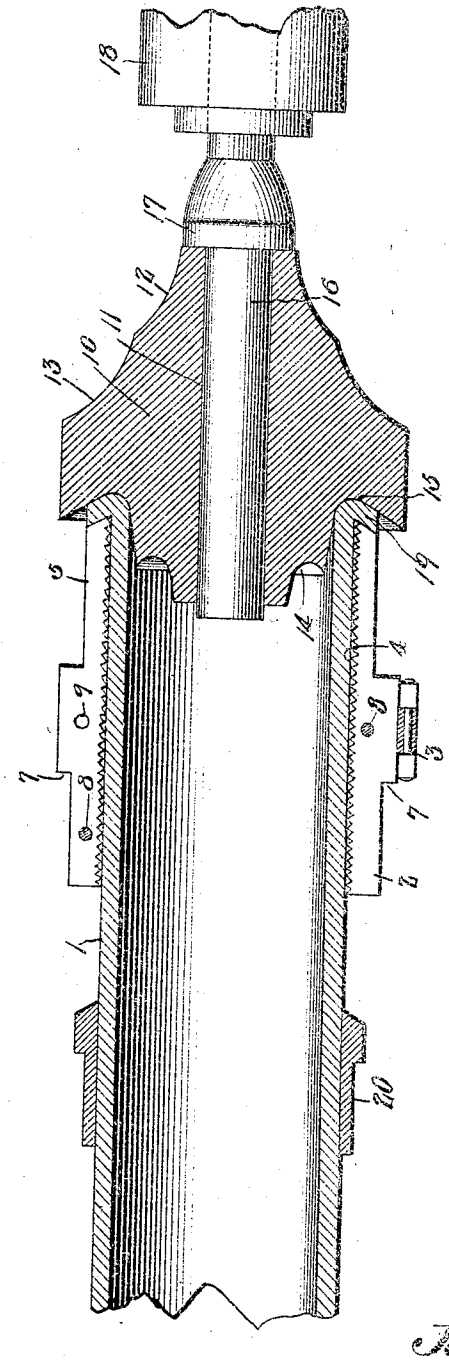


Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN GAPP, OF SCRANTON, PENNSYLVANIA.

PIPE-EXPANDING TOOL.

No. 841,388. Specification of Letters Patent. Patented Jan. 15, 1907.

Application filed January 23, 1906. Serial No. 297,497.

To all whom it may concern:

Be it known that I, JOHN GAPP, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented a new and useful Pipe-Expanding Tool, of which the following is a specification.

The object of the present invention is to provide an improved tool for expanding and beading or forming annular seats upon hard metallic tubes of copper, iron, steel, and the like, and is particularly designed for use in connection with a pneumatic hammer.

The tool includes a clamp member for holding the pipe to be upset and a plunger member to be carried by a pneumatic hammer for contact with a pipe to bend or upset the latter around the core portion of the clamp. It is proposed to have the plunger member reversible, one end being formed for starting the upsetting of the pipe and the other end arranged to complete the bead or flange.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of a tool of the present invention in position for upsetting a pipe. Fig. 2 is an enlarged detail sectional view in the final stage of operation of the tool. Fig. 3 is a detail perspective view of the work-holder. Fig. 4 is a detail perspective view of the stem for the support of the plunger.

Similar numerals of reference designate corresponding parts in all of the figures of the drawings.

For the support of the work, which is a pipe 1, there is provided an appropriate clamp to embrace the pipe, said clamp including duplicate members 2, which are preferably rectangular and hinged, as at 3. The meeting faces of the clamp members are provided with semicylindrical grooves 4, which register when the clamp members are closed and form a work-receiving seat or passage. The forward end of each clamp member is provided with a semicylindrical flange 5, the two flanges coöperating to form a tube constituting a continuation of the bore or passage of the clamp member. Each clamp member is provided at its forward end with a shoulder 6 flush with its front end and extending across that face of the member which is opposite the groove 4. The other two faces of each clamp member are provided with transverse shoulders 7, which are wider than the shoulders 6, the hinge 3 being located upon the adjacent shoulders 7 of the two clamp members.

Preparatory to upsetting the end of the pipe said pipe is received within the clamp or work-holder, and then the latter is held in a vise, (not shown,) the edges of the vise engaging back of one or the other of the sets of shoulders 6 and 7, so as to prevent endwise displacement of the work-holder through the vise. When assembling the work and the work-holder, care should be taken to have that end of the pipe which is to be upset project a suitable distance in front of the members 5, which constitute the core around which the end of the pipe is to be upset. By preference the meeting edges of the clamp members have dowel-pins 8 to engage sockets 9 in the respective opposite edges of the holder.

The plunger consists of a solid body 10, which is tapered or substantially conical in opposite directions from its middle and is pierced by a central longitudinal cylindrical bore or passage 11, open at opposite ends. One end portion of the body is provided with a stepped series of concaved conical portions progressing in diameter from the end of the body to the middle thereof, two such portions being shown at 12 and 13. It will of course be understood that a greater number of conical portions may be employed, if desired. The other end of the body is provided with a stepped series of annular shoulders 14 and 15, progressing in diameter inwardly from the adjacent end of the body, the radial faces of the shoulders being concaved.

Removably associated with the plunger is a cylindrical stem 16, which is of a size to have a working fit within the bore 11 of the body and provided substantially midway of its ends with an annular enlargement 17, constituting a shoulder or abutment.

In practice, the work having been placed in the work-holder and the latter secured in a vise, as hereinbefore described, the body of the plunger and the stem are assembled with the concaved shouldered end against the shoulder 17, the other end portion of the stem being received within a chuck of any

approved or conventional form of pneumatic hammer 18. The hammer and the plunger are then moved up to the work, so as to project one of the conical portions 12 or 13 within the outer end of the pipe. The hammer is then set in operation and the plunger driven against the projecting end of the pipe, so as to upset or bend outwardly that portion of the pipe which projects in front of the core portion 5 of the work-holder. The hammer is then withdrawn from the work, the plunger-head 10 reversed upon the stem 16, and then returned to the work, with the terminal upset end of the pipe within one or the other of the concaved shoulders 14 and 15 of the plunger, whereupon the hammer is again set in operation and the pipe completely upset around the forward edge of the core 5, so as to give the desired shape to the bead or flange 19, which is thus formed upon the pipe.

It will now be understood that the plunger-head and the stem are separable in order that the head may be reversed upon the stem to complete the upsetting of the pipe, which was started by the other end of the head, whereby one tool starts and also completes the upsetting operation. When the purpose of the bead or flange 19 is to hold a collar upon the pipe, such collar, as shown at 20, is placed upon the pipe and slid back of the work-holder. After the flange or bead has been formed and the pipe removed from the work-holder the collar is slid forwardly until stopped by the bead or flange 19, wherefore the collar will be held in place for use in coupling the pipe to another pipe, for instance, as shown in my Patent No. 769,896, issued September 13, 1904.

Having thus described the invention, what is claimed is—

1. A tool of the class described including a stem having one end formed for engagement with a pneumatic hammer and provided intermediate of its ends with a shoulder, a plunger-head reversible upon the other end portion of the stem with its opposite ends provided with working faces of different characters for successive engagement with the work, the shoulder on the stem constituting an abutment for engagement with the head to drive the latter under the action of the hammer.

2. A pipe-expanding tool including a stem having a shoulder intermediate of its ends, one end of said stem forming a reciprocatory drive member, and a tube-upsetting plunger-head reversibly carried by the other end of the stem for engagement with the shoulder, the opposite ends of the plunger-head having working faces of different character for successive engagement with the work.

3. A pipe-expanding tool of the class described, comprising a drive-stem arranged to receive reciprocatory movement, and a reversible plunger-head carried thereby and provided at its opposite ends with working faces for upsetting the ends of a tube, the working face of one end of the head differing from that of the other end of the head.

4. A tool of the class described comprising a stem, and a reversible head having an opening receiving the stem, one end of the head having a working face, and the other end of the head having a working face of different character.

5. A tool of the class described having a reversible plunger-head, one end of the head having a tapered working face, and the other end of the head having an annular shoulder with its radial working face provided with an annular groove.

6. A tool of the class described comprising a reversible head having one end portion provided with a stepped series of conical portions, and the other end of the head being provided with a stepped series of annular shoulders having their radial working faces provided with annular grooves.

7. A tool of the class described comprising in combination a plunger-head having a work-face, and a work-holder provided at its forward end with a tubular core around which the work is to be upset, and provided in rear of the core with a shoulder for engagement with a vise.

8. A tool of the class described comprising in combination an upsetting-plunger, and a work-holder including hinged members having corresponding semicylindrical grooves constituting a work-receiving seat, the front ends of the members having semicylindrical flanges constituting a core around which the work is to be upset, and the members being provided in rear of the core with shoulders for engagement by a vise.

9. A tool of the class described comprising a stem, and a tubular expanding plunger-head reversibly embracing the stem, one end of the head having a working face, and the other end of the head having a working face differing from the first-mentioned face.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN GAPP.

Witnesses:
FRED W. NICHOLSON,
FREDERICK C. EHRHARDT.