G. FITCH & P. SHAFFER.

Machines for Forging Metallic Sockets.

No. 134,045. Patented Dec. 17, 1872.

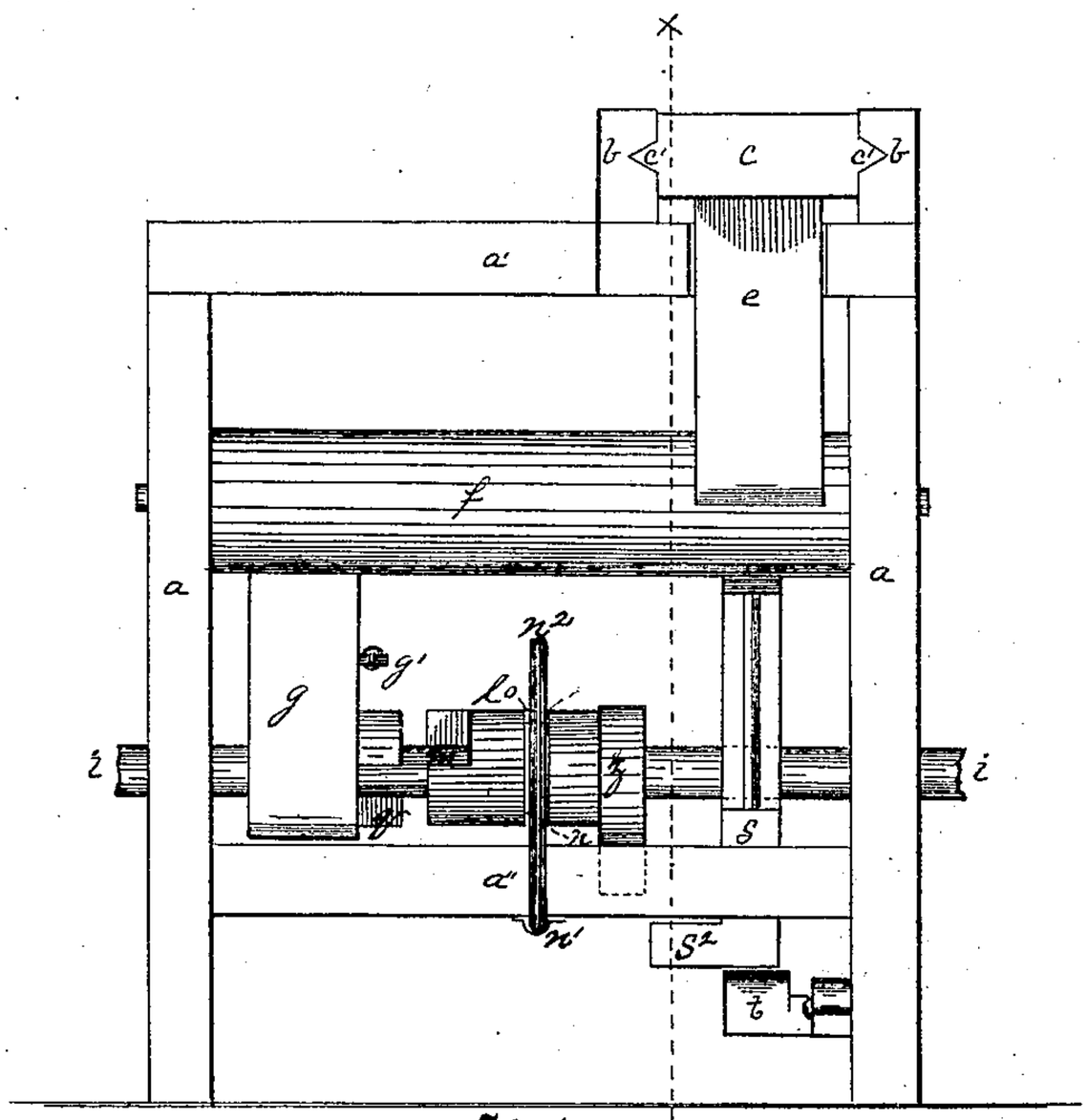

Fig. 1.

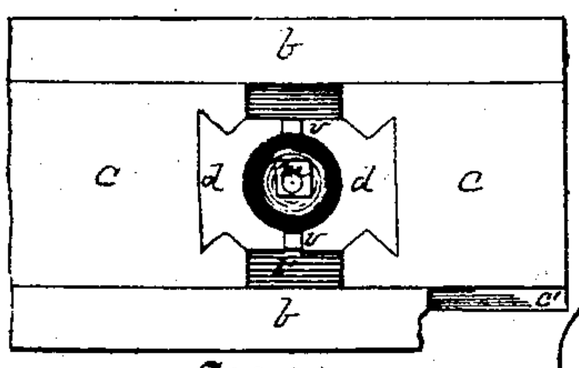

Fig. 4.

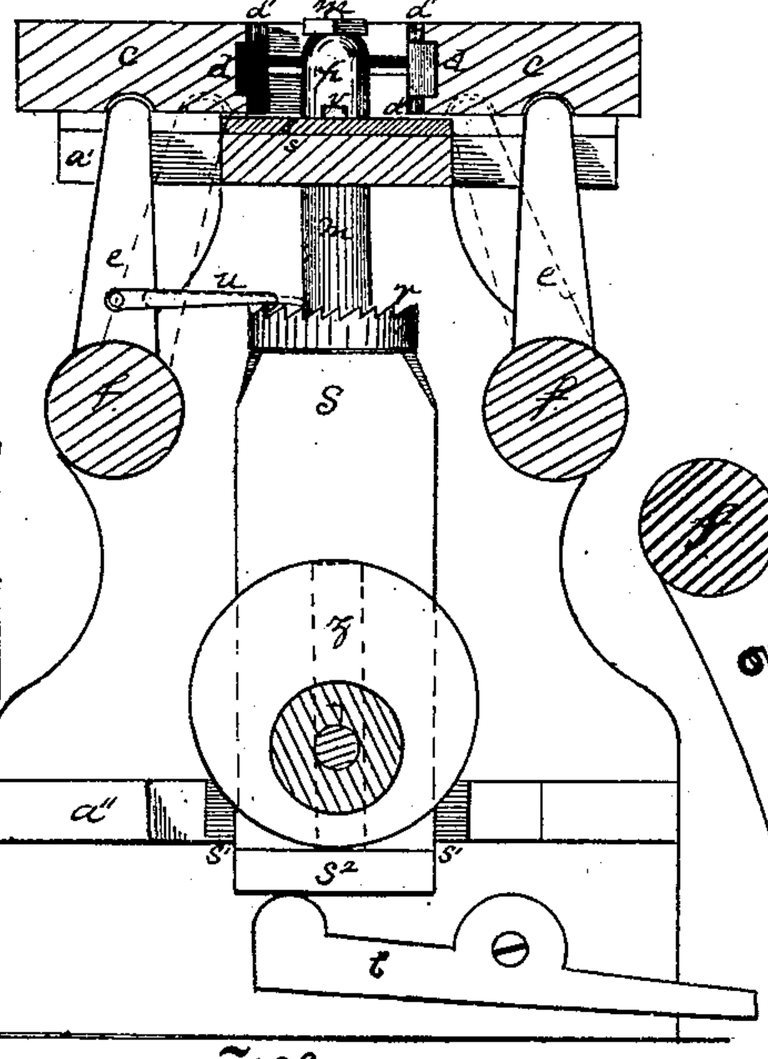

Fig. 2.

Fig. 6.

Fig. 5

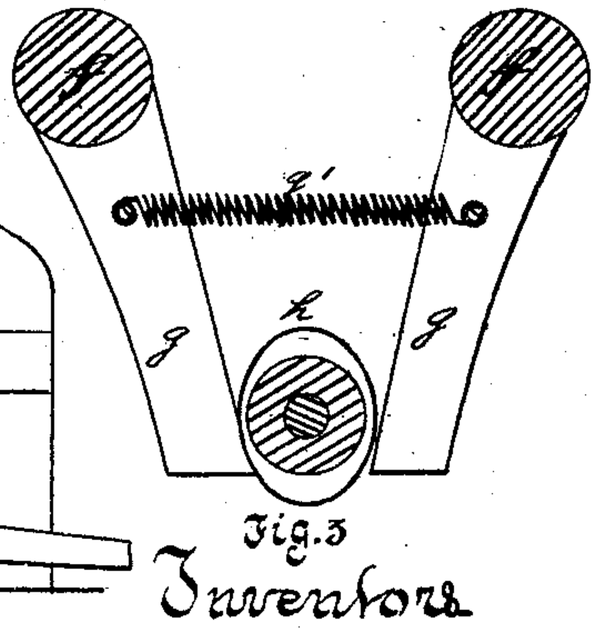

Fig. 3

Witnesses.
R. Wirshall
James D. Kay

Inventors
George Fitch
Peter Shaffer
by Bakewell Christy & Kerr
their Attys

UNITED STATES PATENT OFFICE.

GEORGE FITCH AND PETER SHAFFER, OF ETNA, ASSIGNORS TO THEMSELVES AND JACOB BECK, OF SHARPSBURG, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR FORGING METALLIC SOCKETS.

Specification forming part of Letters Patent No. **131,045**, dated December 17, 1872.

To all whom it may concern:

Be it known that we, GEORGE FITCH and PETER SHAFFER, of Etna, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of Metallic Sockets; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a side elevation of our improved machine for forming and welding metallic sockets; Fig. 2 is a vertical section through the line *x x*, Fig. 1; Fig. 3 is a sectional view of the device for producing a reciprocating motion, detached; Fig. 4 is a plan view of the dies and mandrel detached; Fig. 5 is a view of a socket as it comes from the machine; and Fig. 6 is a view of the socket as used in connecting tubes.

Our invention consists in the construction of a machine for welding and forming metallic sockets for gas and water pipes or tubes, and for other purposes, upon a rotating mandrel, by means of a pair of properly-shaped dies operating in connection therewith, as hereinafter described and claimed.

Heretofore sockets for pipes and other purposes have been forged by hand, and consequently the operation has been slow and expensive.

In a frame consisting of the side pieces *a a* and top and bottom pieces *a' a''* we place the operative parts of our machine. Upon one end of the top piece *a'* is a pair of guides, *b b*, which have grooves in their inner faces. The slides *c c*, having dies *d d* set in their inner ends and tongues *c' c'* entering the grooves in guides *b b*, operate in the guides with a reciprocating motion. The slides *c c* are actuated by the vibrating arms *e e*, which project upward from the shafts *f f* into the sockets in the under sides of the slides. Projecting downward from the other end of each of the shafts *f f*, which are journaled in the sides *a a*, is an arm, *g*, which arms are connected with each other by the spiral spring *g'*. Standing between the lower ends of the arms *g g*, and hung on the shaft *i*, is a double eccentric or cam, *h*. The ends of the shaft *i* extend out beyond the sides *a a*, and it is operated by power, applied in any convenient or easy way. On the shaft *i* is a sliding hub or collar, *l*, which is attached to the shaft by the bead *m* on the shaft extending into the hub *l*. The hub is moved along the shaft by a forked arm, *n*, which, extending up from the rod n^1, enters the groove *o*, and to which a vibratory motion is communicated by the crank n^2. By moving the crank n^2 in the proper direction, the hub is thrown into gear with the double cam *h*, with which it is connected by the clutch *q*. The cam *h*, being thus rigidly attached to the shaft *i*, is turned with it when it is in motion, and thereby communicates a vibratory motion to the arms *g g* and through the shafts *f f* to the arms *e e*, which, as before said, move the slides *c c*. Projecting upward through the top plate *b'*, midway between the operative faces of the dies *d d*, is a round or circular mandrel, *p*, which is set on a spindle, *m*, the lower end of which runs down below the plate *b'*, and is there connected with the pinion *r*. The pinion *r* is pivoted on the upper end of the upright piece *s*, which has a vertical motion in the guides *s' s'*, communicated to it by the treadle *t*. By means of this treadle the mandrel *p* is raised through the plate *a'* to a level with or opposite to the operative faces of the dies *d d*. Attached to one of the vibrating arms *e* is a hook, *u*, which extends inward to the pinion *r*, and which, when the mandrel *p* is raised and the machine is in operation, at every vibration of the arm *e* catches on one of the teeth of the pinion and turns the mandrel *p* a part of a revolution. In this way the mandrel is caused to revolve or rotate intermittently, whenever the machine is in operation, at the backward stroke or movement of the slides *c c*. The operative faces of the dies *d d* are bounded at the top and bottom by the flanges *d' d'*, and at the sides of the mandrel *p* are two projections, *v v*, the height of which is equal to the height of the lower flange *d'*.

The operation is as follows: The blanks for forming the sockets are cut off and bent to a circular or nearly circular shape on a separate machine, and are heated, in a proper furnace, to a welding heat. The workman then places his foot upon the treadle, raises the mandrel *p*, and places a heated blank upon it. The revolving center-shaft *i* is then connected with

the double cam *h* by means of the hub *l*, as described, and the machine is in operation. The vibrating arms *e e* cause the dies *d* to administer a series of blows to the heated blank, which is turned partially around by the rotating, between each stroke, of the dies. This causes the ends to be welded together, and the blanks to be swaged into shape. When the blank is finished, the hub *l* is thrown out of gear with the double cam *h*, and is moved to the other side of the machine, so as to bring the eccentric *z* over the shoulder s^2 on the lower end of the upright *s*. The revolution of the shaft *i* causes the cam *z* to turn against the shoulder s^2, force down the upright *s*, thereby withdrawing the mandrel from the finished blank or socket, which is then removed by a pair of tongs, leaving the machine free for another operation. The dies *d d* are removable, as is also the mandrel *p*, so that other dies and mandrels may be interchanged therefor, in order that sockets of several different sizes may be made on one machine. By attaching the slides *c c* rigidly to the arms *e e* the guides may be dispensed with, but the operation of the machine is not so true or satisfactory. After the sockets have been formed, as described, they are tapped, and are then ready for use. The projections *v v* sustain the blank above the lower flanges in the dies *d d* so that it shall enter the concavities in the faces of the dies.

Other well-known devices may be used for rotating the mandrel *p* and for operating the side dies instead of those herein described.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The mandrel *p*, intermittently rotating and stationary, in combination with side dies operating toward and from such mandrel, substantially as described.

2. The arrangement of slides *c c*, arms *e e*, hook *u*, and rachet-pinion *r*, whereby the spindle *m* is rotated at the same time the dies are retracted, and is stationary at the forward stroke of the dies, substantially as set forth.

3. The sliding hub *l*, carrying an eccentric, *z*, and movable on its shaft, so as at one end to interlock with the clutch *q* and operate the dies, and when shifted in the opposite direction to engage the shoulder s^2 and withdraw the mandrel from the blank, substantially as set forth.

In testimony whereof, we, the said GEORGE FITCH and PETER SHAFFER, have hereunto set our hands.

GEORGE FITCH.
PETER SHAFFER.

Witnesses:
A. S. NICHOLSON,
JAMES I. KAY.