2 Sheets—Sheet 1.

J. H. ALKER.

Machine for Bending Tubular Sockets.

No. 200,595. **Patented Feb. 26, 1878.**

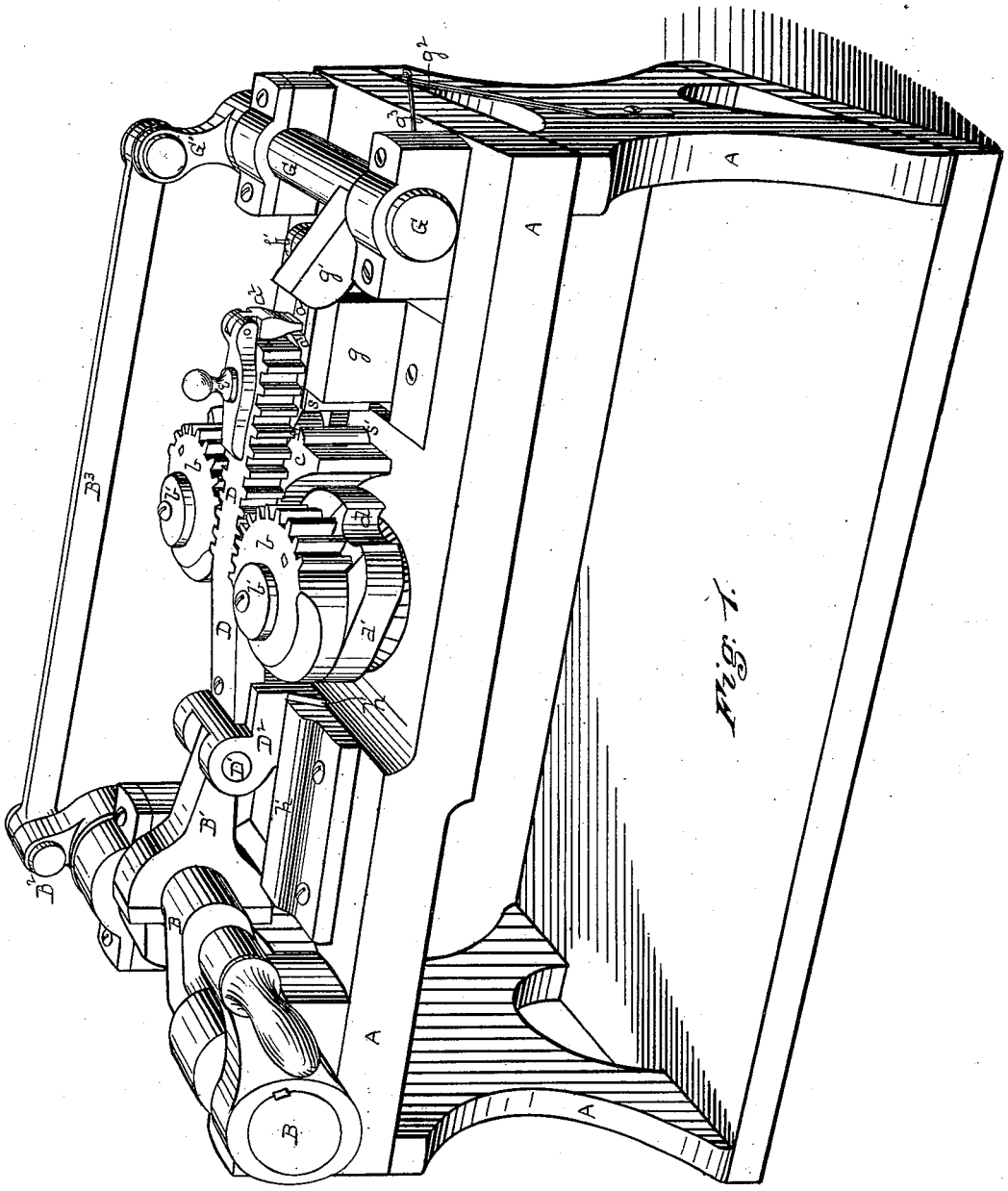

Fig. 1.

Witnesses
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Inventor John H. Alker.
By Attorney George H. Christy

2 Sheets—Sheet 2.

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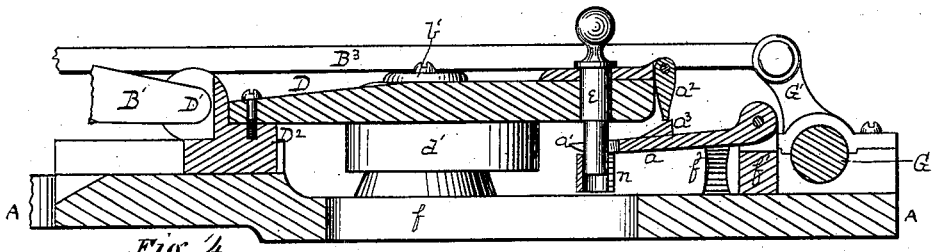

Fig. 4.

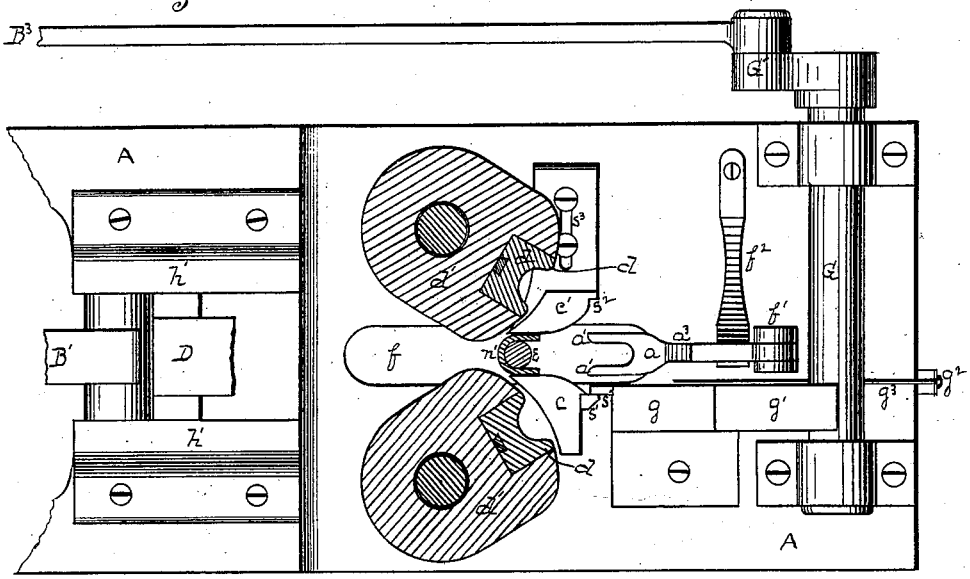

Fig. 2.

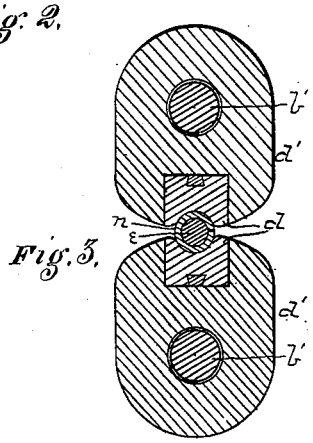

Fig. 3.

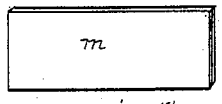

Fig. 5.

Fig. 6.

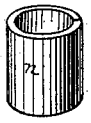

Fig. 7.

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN H. ALKER, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO JONES & LAUGHLINS, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR BENDING TUBULAR SOCKETS.

Specification forming part of Letters Patent No. **200,595**, dated February 26, 1878; application filed December 5, 1877.

To all whom it may concern:

Be it known that I, JOHN H. ALKER, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Machines for Bending Tubular Sockets; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—like letters indicating like parts—

Figure 1, Sheet 1, is a perspective view of my machine from the feeding side and contiguous end. Fig. 2, Sheet 2, shows a plan view of a portion of the operative devices and a horizontal sectional view of the mandrel and dies which complete the bend. Fig. 3 is a like view of the latter dies, the mandrel, and blank in the position they occupy at the completion of the bending operation. Fig. 4 shows a vertical longitudinal section of the principal operative parts of the machine. Fig. 5 shows a blank sheared off ready for bending, and Figs. 6 and 7 show the results of the first and second bending operations.

My improved bending-machine is designed for shearing and bending or shaping short tubular metallic articles, such as collars, rings, sockets, and thimbles, preparatory to welding and finishing, which latter operations are done on a separate machine and at a subsequent heat.

A frame-work of any suitable construction is shown at A, a cranked driving-shaft at B, and a connecting-rod at B^1. The latter is jointed at D^1 to a cross-head, D^2, which latter operates a reciprocating rack, D, which is toothed on both sides, and the teeth of this rack mesh into the segmental oscillatory gear-wheels *b b*, each mounted on an axial stem, *b'*. A pair of oscillating die-blocks, *d' d'*, each carrying a bending-die, *d*, having a U-shaped face, are made fast to the gear-wheels *b b*. The rack D is held in its proper line of motion by a rigid connection to the cross-head, D^2, and the latter is properly held and guided by a dovetailed slide, *h*, on its under face, working between and under the guides *h'*.

The shaft B, by an additional crank, B^2, and connecting-rod B^3, transmits an intermitting oscillatory motion through crank G^1 to a shaft, G, at the opposite end of the machine. This shaft carries and operates a cam, g^1, which latter gives an intermittingly forward stroke to a shear-block, *g*, such shear-block moving in slides or ways, and carrying on its forward end a shear, *s*. A counter-shear affixed to one, *c*, of a pair of formers, *c c'*, is represented at s^1. The reverse motion of the moving shear is imparted by a spring, g^2, and rod-connection g^3. A pair of formers (represented at *c c'*) have inner sloping converging walls, as more fully shown in Fig. 2. One of them, *c'*, is made with a shoulder, s^2, which acts as a stop or gage, against which the end of the bar comes in feeding, and thereby the length of the blank *m* is regulated before the shears cut it off. This former, with its stop, is adjustable by any suitable means, as indicated at s^3, so that the length of the blank may be varied at pleasure.

The forward end of the rack D carries a mandrel, *e*, the lower end of which is of the size and shape of the socket-eye, and which at the time of feed is forward, or to the right of the plane of feed. The bar then being fed in between the shears, the latter cut off the blank *m*, and the back-stroke of the rack begins. The lower projecting end of the mandrel *e* engages the blank at or about the middle of one side, and, carrying it back between the formers *c c'*, brings it to a U form, as shown at *n'* in Figs. 2 and 6. The same back-stroke of the rack also shifts the dies *d d* from the position shown in Fig. 1 to that shown in Fig. 2. A continuation of the same motion carries the blank *n'* past the rear ends of the formers *c c'*, and also brings the dies *d d* around, so that they shall encompass the blank laterally, and close in on the arms of the U-shaped blank, and bend them around the mandrel, as represented at *n*, Figs. 3 and 7, giving either a butt or lap joint, as may be preferred, provision having been made accordingly in the shearing operation; and, if desired, one die may be so shaped as to close in one arm of the U a little in advance of the other when a lap-joint is to be provided for. With the next forward stroke of the rack the gripe of the dies *d* will be released, and the blank *n* will fall off the

mandrel through a slit, *f*, in the frame of the machine, or it will otherwise be forced off by a forked stripper, *a*, which is pivoted to a post, f^1, and held up by a spring, f^2, in such position that with such next forward stroke of the rack the prongs a^1 will enter between the under side of the rack and the top end of the socket-blank, and force the latter downward off the mandrel, the mandrel passing into the crotch of the stripper-prongs a^1; but more perfectly to secure this stripping effect, I pivot an outwardly-swinging toe, a^2, to the end of the rack, and in such position that after the stripper-prongs a^1 have engaged the blank the toe a^2, operating on an incline, a^3, on the stripper *a*, will depress the stripper-prongs a^1, as indicated in Fig. 4, and so strip off the blank. When the rack D again moves back to bend another blank the toe a^2 swings outwardly over the incline a^3, so as not then to depress the stripper.

The described machine, by suitable changes in the form of the mandrel and dies, can be readily adapted to bending and shaping metallic rings to be welded onto shanks or stems of tools, so as to form shoulders or collars thereon; also, for shaping and bending chain-links and similar articles.

Where scarfed and lapped ends are required, the form or cutting stroke of the shears may be varied to accomplish such end, and these, as well as all other similar modifications of the devices described, are hereby included within the scope of my invention.

I am aware that shears, formers, bending-mandrels, and U-faced rotating bending-dies are not new, and that one combination of such devices is shown and described in patent to A. M. George, of February 27, 1855; hence I make no claim outside of the combinations hereinafter set forth, except that mechanical equivalents are included.

I claim herein as my invention—

1. A reciprocating toothed rack, D, for communicating an intermittent oscillatory motion in opposite directions, through gear-wheels *b b*, to a pair of U-faced bending-dies, *d d*, in combination with shears *s* s^1, formers *c* *c'*, and mandrel *e*, substantially as set forth.

2. The stripper *a*, having wedge-shaped prongs a^1, and an incline, a^3, in combination with the swinging toe a^2 attached to the rack, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN H. ALKER.

Witnesses:
J. J. McCORMICK,
CLAUDIUS L. PARKER.