

STOVE-PIPE ELBOW-MACHINE.

Patented June 13, 1876.

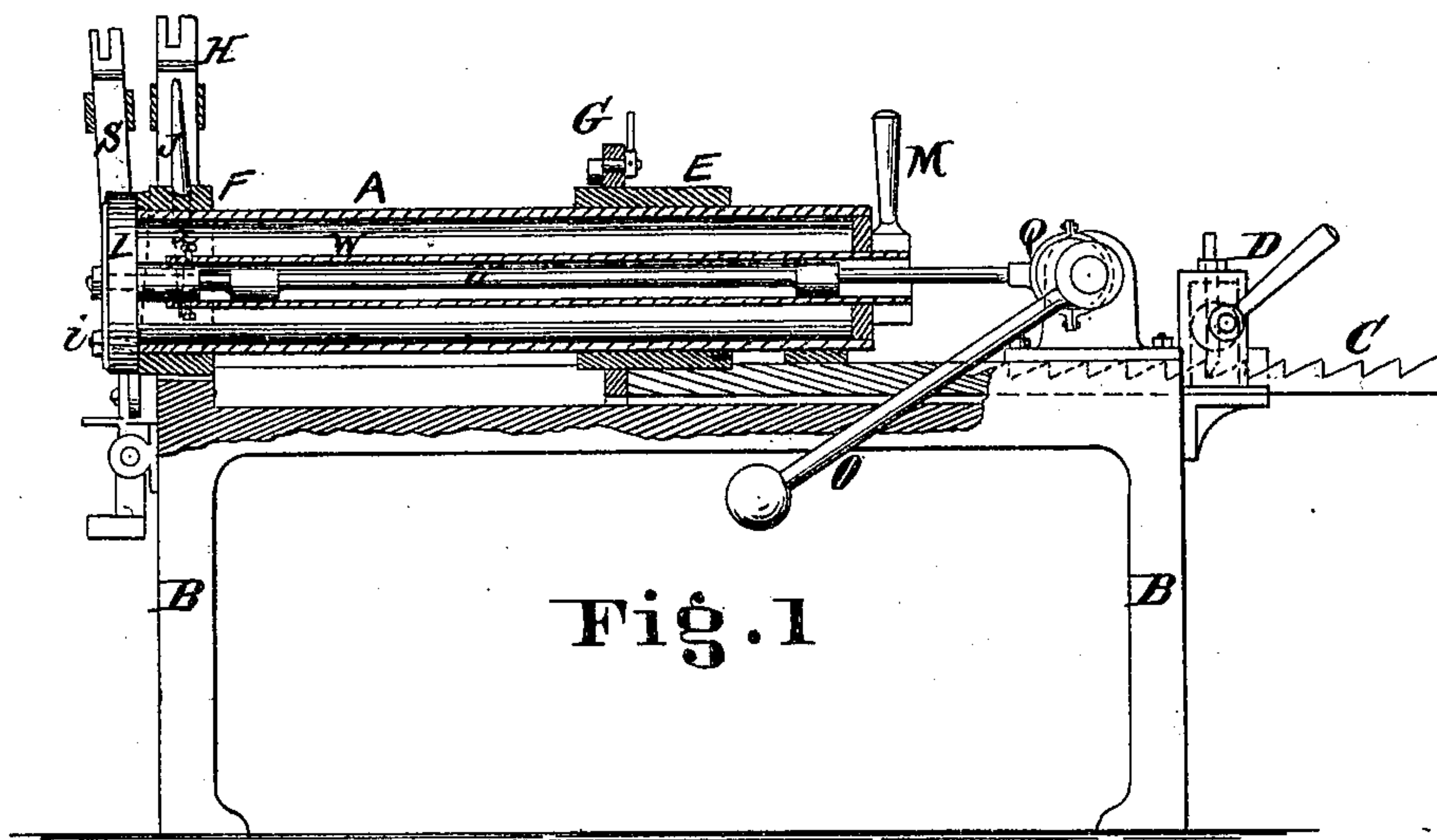


Fig. 2

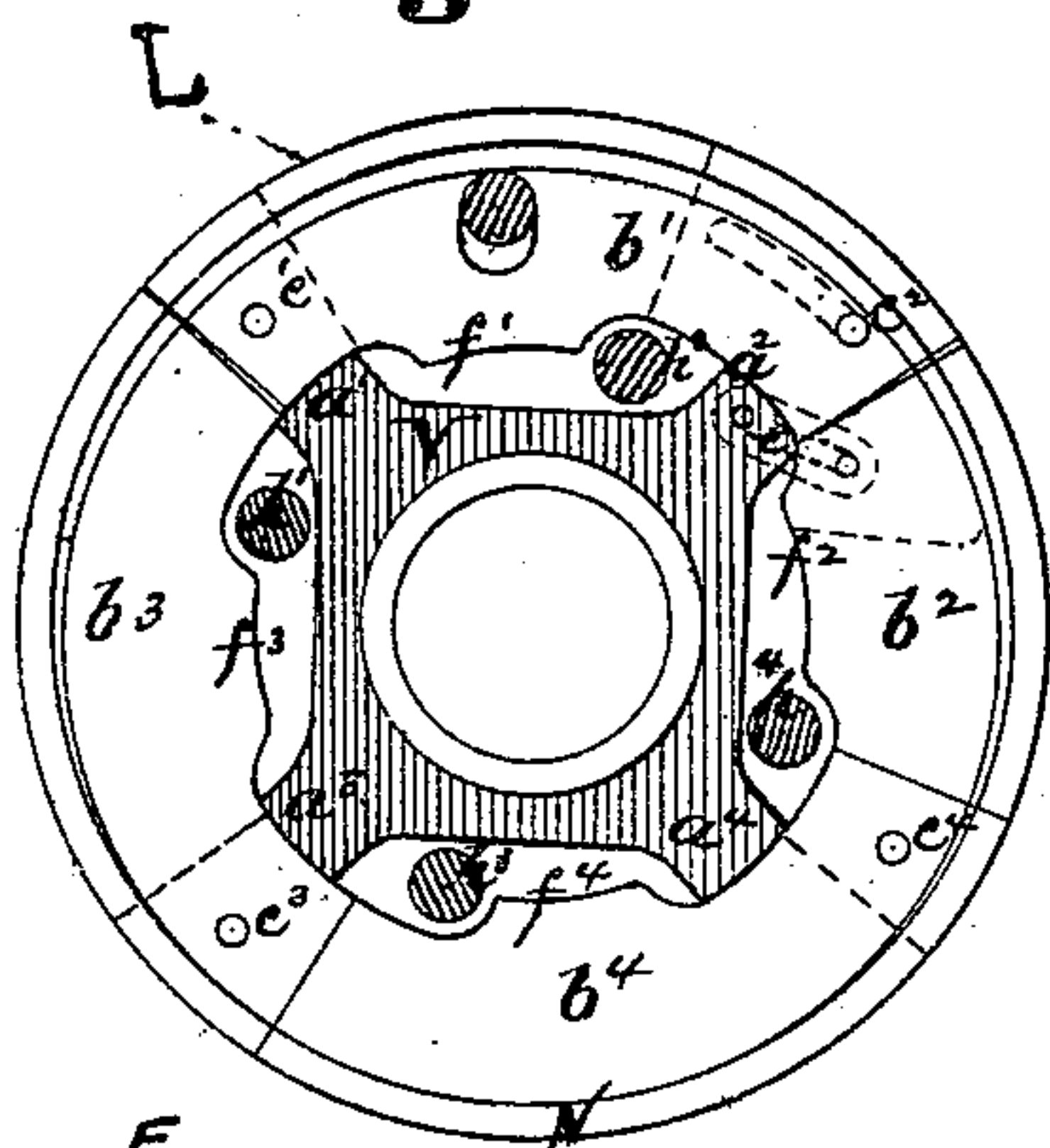


Fig. 3

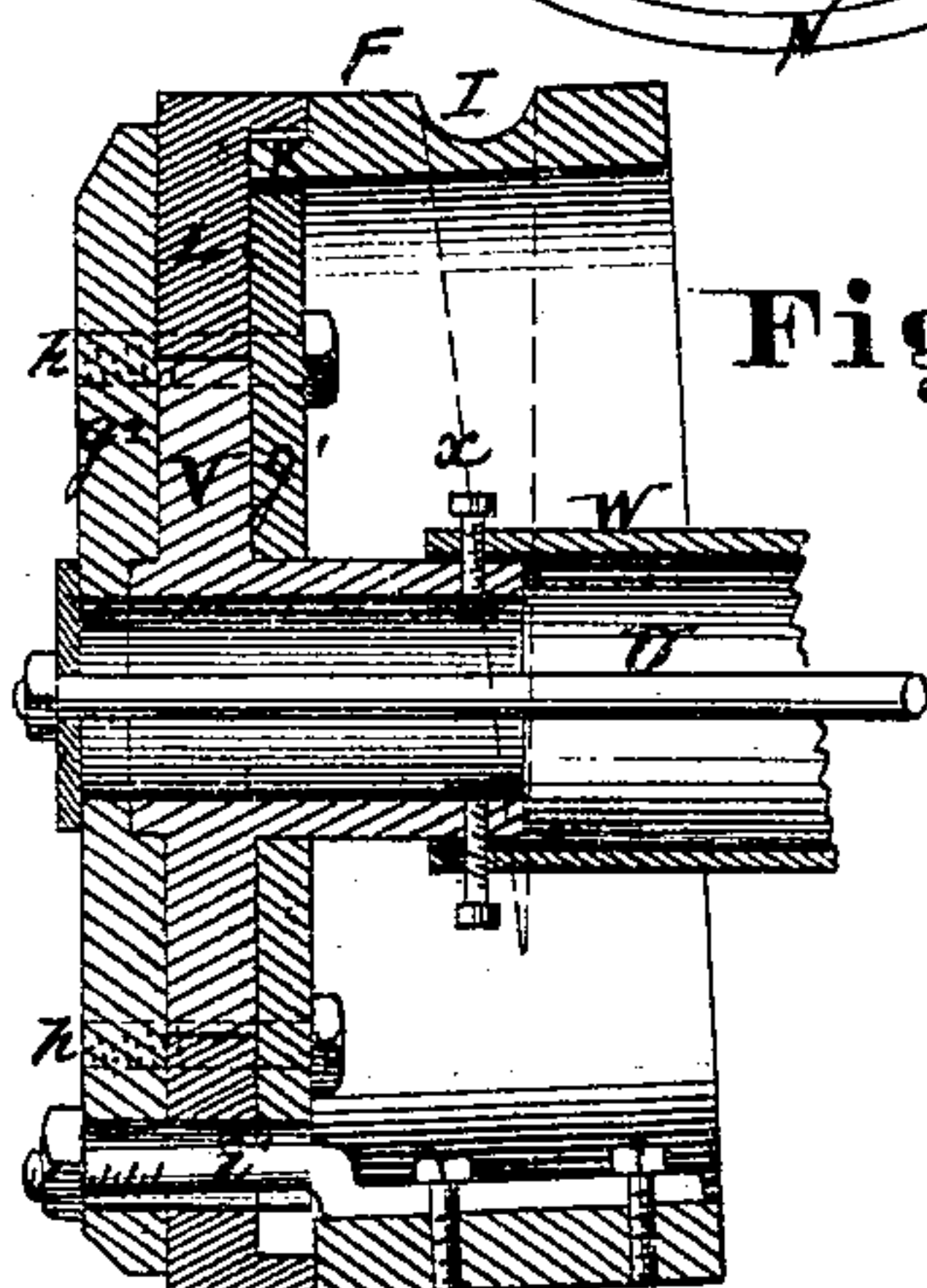
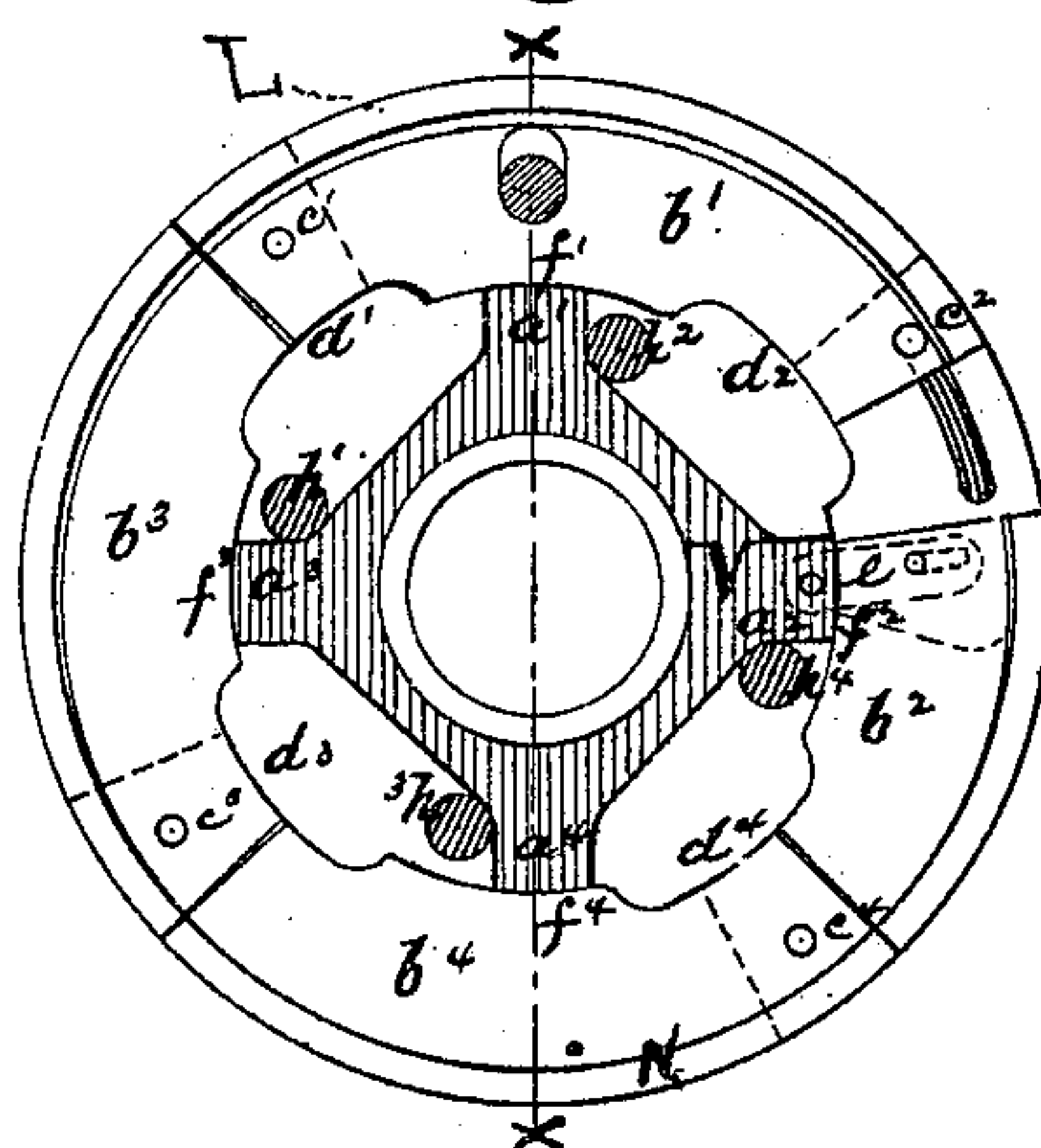


Fig. 4

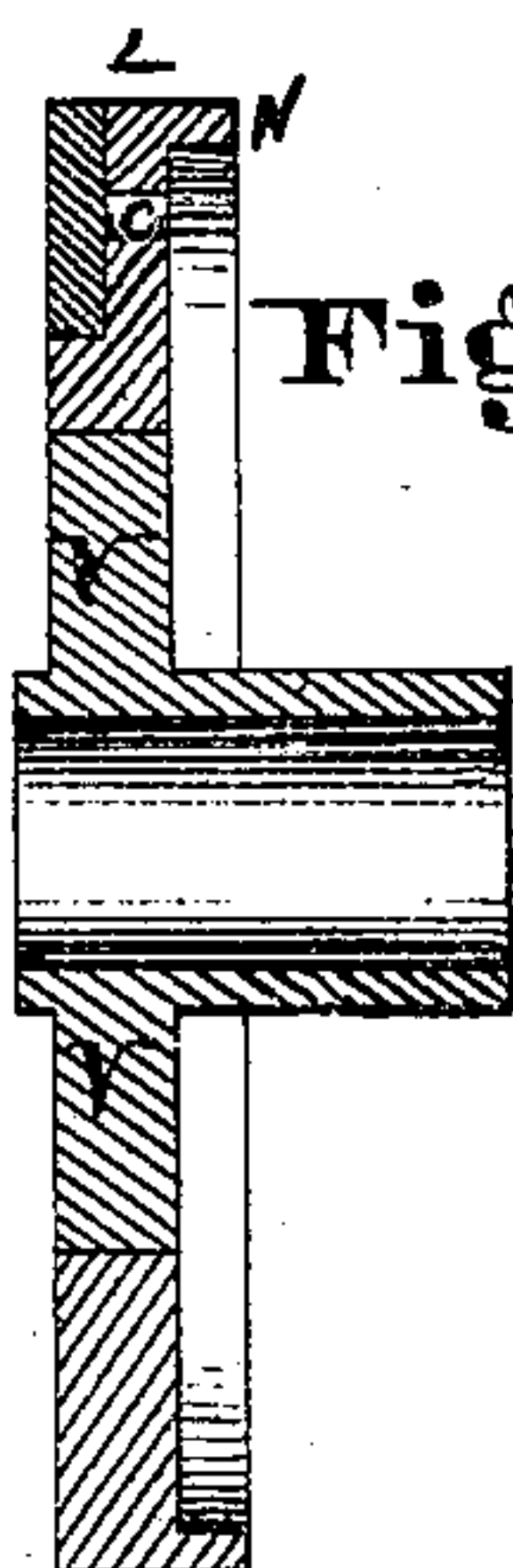


Fig. 5

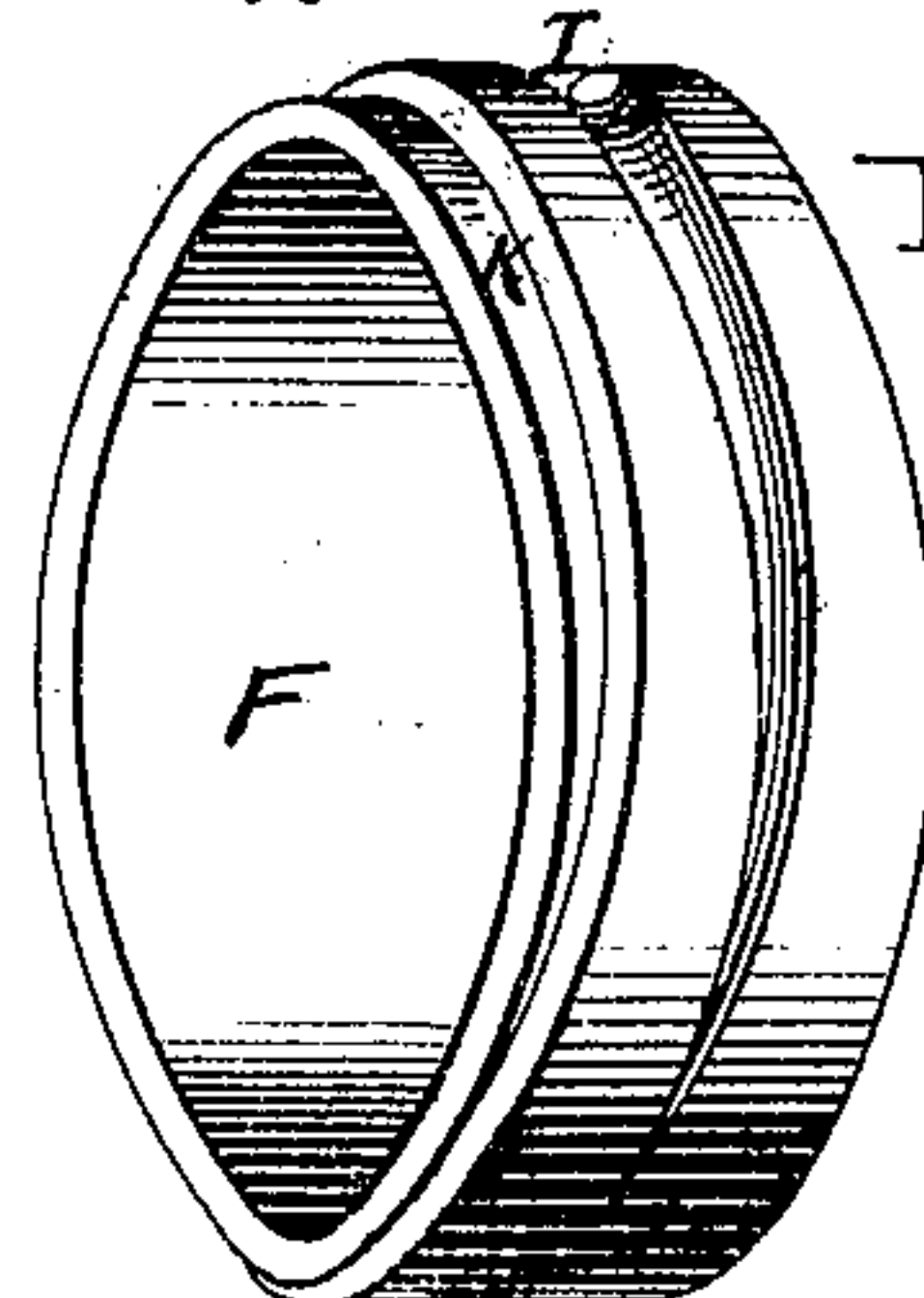


Fig. 6

Attest
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Henry Fisher
Inventor
Henry Miller and Atty.
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UNITED STATES PATENT OFFICE.

HENRY FISHER, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF HIS RIGHT
TO JOHN M. JOHANNIGMAN, OF SAME PLACE.

IMPROVEMENT IN STOVE-PIPE-ELBOW MACHINES.

Specification forming part of Letters Patent No. 178,519, dated June 13, 1876; application filed
October 14, 1875.

To all whom it may concern:

Be it known that I, HENRY FISHER, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Sheet-Metal-Elbow Machines, of which the following is a specification:

This invention relates to a machine of that class for forming sheet-metal elbows in which the surplus metal is taken up by a series of inward crimps, which are afterward folded over and pressed down, leaving a smooth finish on the interior as well as the exterior of the elbow.

My invention consists in the peculiar construction of an oscillating expansible head, that is perfectly rigid at all points around its periphery, whether it be expanded or contracted, and at the same time approximating a complete circle in both positions by expanding equally around its circumference; also, in the shape of the collar to which the head is attached, and from a fixed point on which it oscillates when folding over the metal.

In the annexed drawings, Figure 1 is a longitudinal sectional elevation of a machine with my invention applied thereto. Fig. 2 is a plan of the expansible oscillating head with the inner collar removed, showing the head as it appears when contracted. Fig. 3 is a plan of the same with the head expanded. Fig. 4 is a sectional elevation through line xx of Fig. 3, showing the head expanded and laid over the end of the collar above referred to. Fig. 5 is a section through one of the joints of the expansible ring. Fig. 6 is a perspective view of the collar with the mandrel removed.

In the machine, as represented in Fig. 1, a hollow mandrel, A, is mounted on shears B. A rack, C, slides in ways on shears B, the rack being secured to sleeve E, and is controlled by the pawl attachment D. The pipe to be bent is passed over the head L, collar F, and sleeve E, the seam of the pipe being left unfastened, for the purpose presently to be explained. The collar F and sleeve E being of the same diameter as the inside of said pipe, the pipe can be firmly held at any desired point by the cam-lever G, when it will be ready to feed up to the crimper. In the collar F is

formed a semicircular concavity, I, gradually diminishing in size, and extending about three-fourths around the circumference of the collar, where it terminates, as shown in Fig. 6. On the clamps H a male part, J, is made to fit into said concavity, when the clamps are closed and held tightly together, and by this means an inward tuck is made in that part of the pipe covering the groove. The pipe is then moved forward by the rack C until it reaches that part of the collar F indicated by the letter K, the pipe being sprung apart at the seam in order to unlock it from the groove J, when the head L is expanded by turning the lever M, which controls the cam V, by means of a hollow shaft, W, connected with the head L, at x , in such a manner as to allow the head to oscillate while it is being moved over the collar F by the lever O, eccentric Q, and rod U.

When the head L is expanded, as before described, the clamps S are locked together, tightly clutching the periphery of the head and relieving it from strain. The rim N of the head L is then brought in contact with the aforesaid tuck, and moved forward over that part of the collar F indicated by the letter K, carrying with it the tuck, and completely folding it over. The operation of crimping and folding over is repeated until the pipe has received the desired curve.

In the expansible head L the cam V is represented as having four points, $a^1 a^2 a^3 a^4$, acting upon the expansible ring, which is also represented in four segments, $b^1 b^2 b^3 b^4$, although it is obvious in both cases this number might be changed without affecting the working utility of the ring. These segments are jointed to each other at $c^1 c^2 c^3 c^4$ in such a manner as to allow of a free expansion. The pin joining the segments b^2 and b^4 works in a slot in segment b^2 , which permits the ring to expand. The cam V is connected to the said ring by a strap from segment b^2 to point a^2 . The strap e is fitted with a slot at one end, in which the pin that connects it with the segment aforesaid moves while the ring is expanded or contracted. When the ring is contracted the points $a^1 a^2 a^3 a^4$ of the cam V are moved into the spaces $d^1 d^2 d^3 d^4$, as shown in Fig. 2, and when the ring is expanded the

points $a^1 a^2 a^3 a^4$ are bearing upon the four protruding points $f^1 f^2 f^3 f^4$ —one on each of the segments above referred to. The expansible ring and cam V work in a groove made by the two washers $g^1 g^2$, which are held together by the screws $h^1 h^2 h^3 h^4$, the expansible head being attached to the collar F by means of the screw i , on which it is free to oscillate.

The folding over of the metal is accomplished by the expansible head L, which takes hold of the crimp and carries it with it, the clamp S keeping the pipe from expanding.

The pipe, being creased before it is riveted, will spring apart when the crease is being removed from the groove in which it was made.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the ring F, having groove I and former K, with clamps H J, substantially as and for the purpose specified.

2. The oscillating expansible head, constructed with cam V, having impinging points $a^1 a^2 a^3 a^4$, connected segments $b^1 b^2 b^3 b^4$, recesses $d^1 d^2 d^3 d^4$, and projections $f^1 f^2 f^3 f^4$, with the rim N of the head fitting over the collar F at K, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 25th day of September, 1875.

HENRY FISHER.

Witnesses:

JOHN M. FISHER,
HENRY MILLWARD.