(No Model.) 2 Sheets—Sheet 1.

F. A. HADLEY & H. F. L. DANFORD.

TINSMITH'S BEADING MACHINE.

No. 535,539. Patented Mar. 12, 1895.

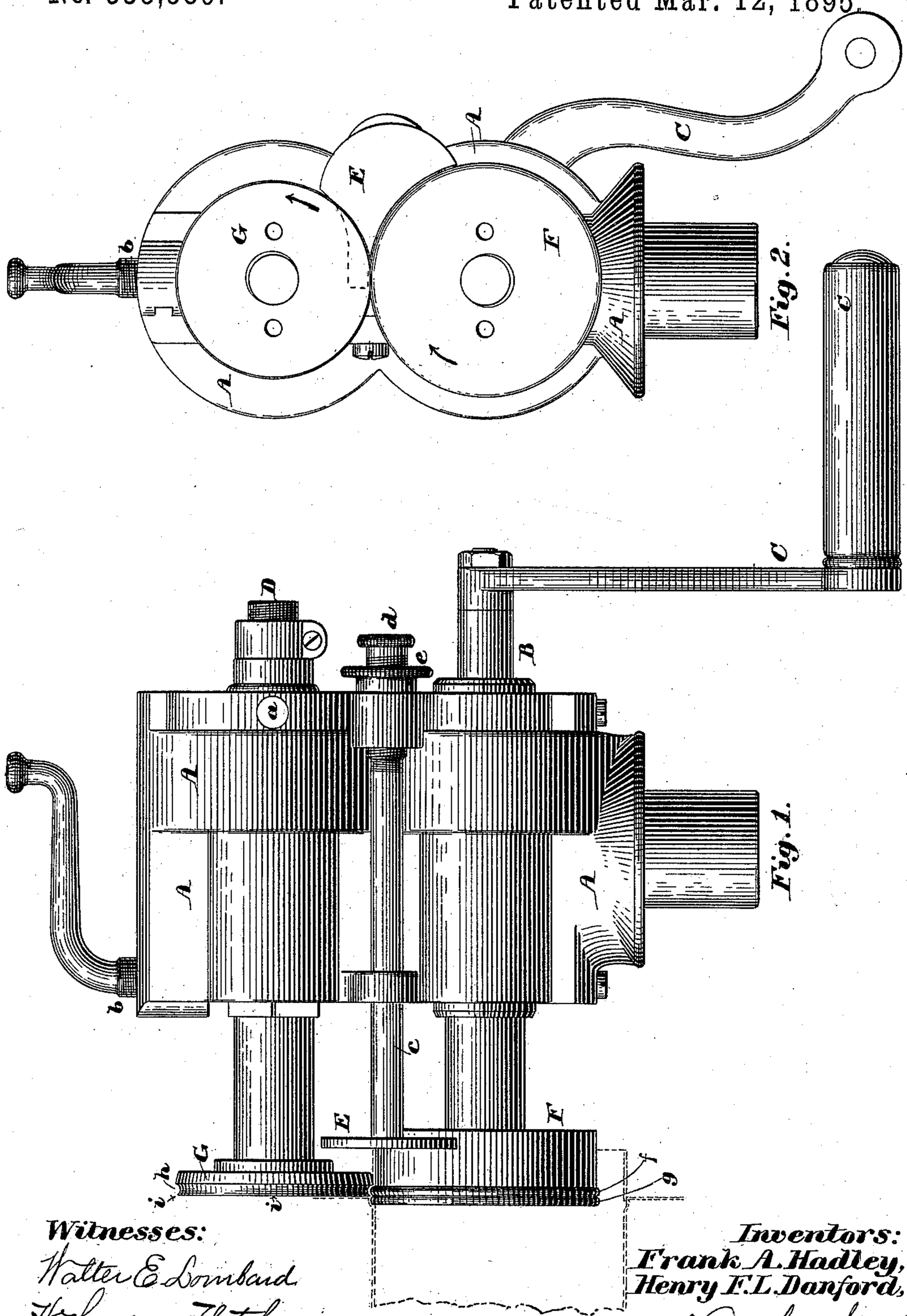

Fig. 2.

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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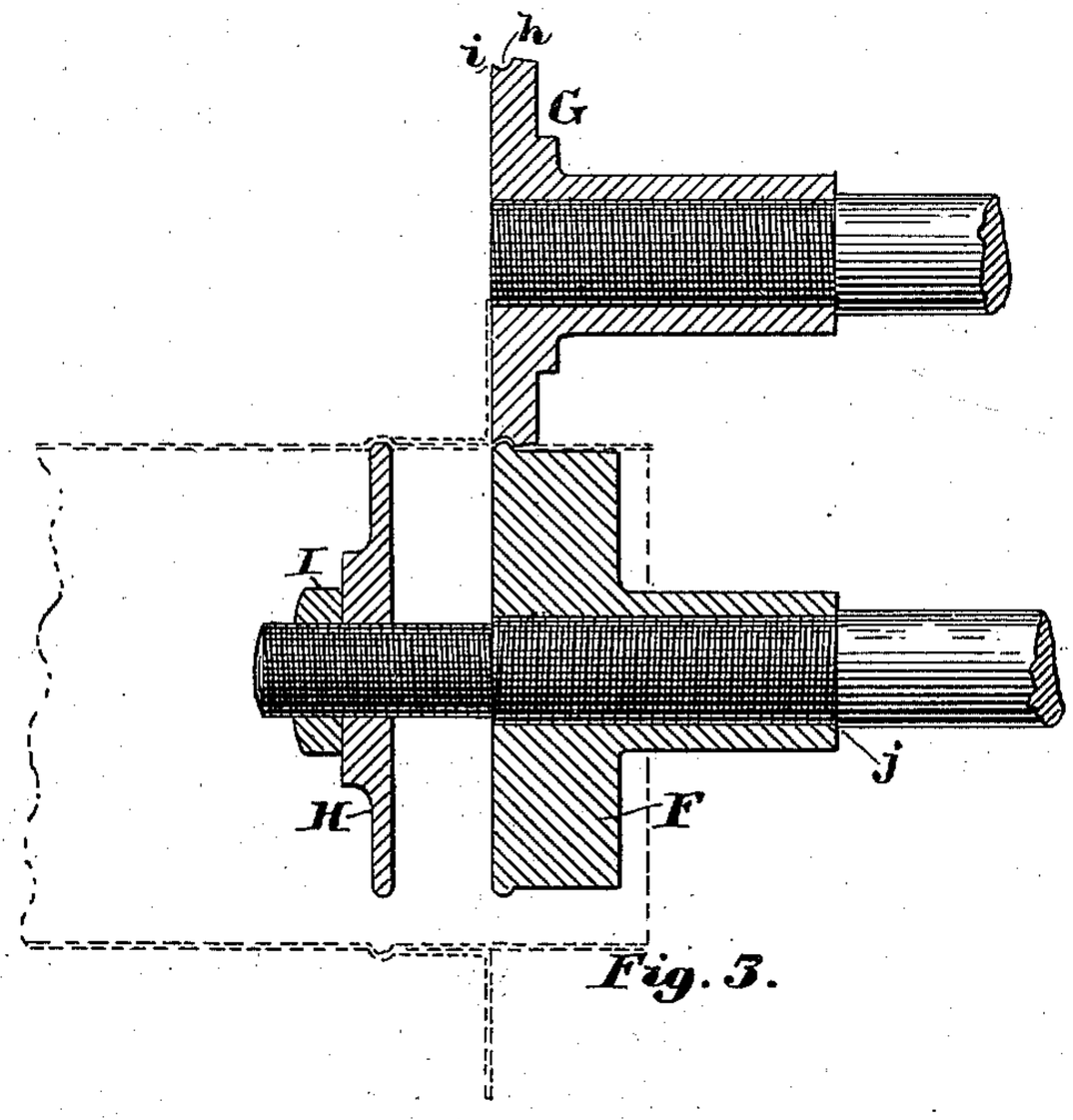

Fig. 3.

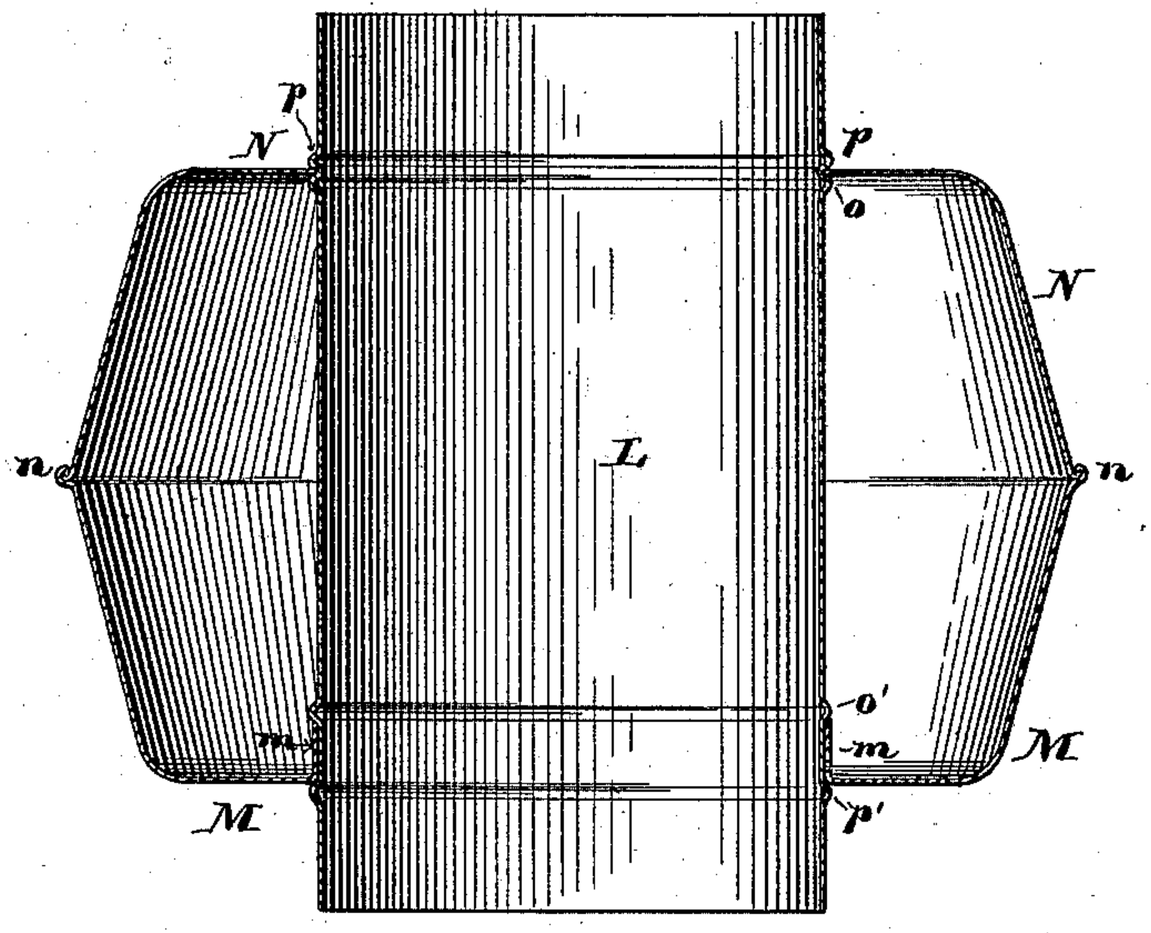

Fig. 4.

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UNITED STATES PATENT OFFICE.

FRANK A. HADLEY, OF MELROSE, AND HENRY F. L. DANFORD, OF MALDEN, MASSACHUSETTS.

TINSMITH'S BEADING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 535,539, dated March 12, 1895.

Application filed December 21, 1894. Serial No. 532,519. (No model.)

To all whom it may concern:

Be it known that we, FRANK A. HADLEY, of Melrose, and HENRY F. L. DANFORD, of Malden, in the county of Middlesex, State of Massachusetts, have invented certain new and useful Improvements in Tinsmiths' Beading-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

Our invention relates to tinsmiths' beading machines and has for its object the adaptation of such machines to the performing of certain special kinds of work hereinafter described and it consists in certain novel features of construction, arrangement and combination of parts, which will be readily understood by reference to the description of the accompanying drawings, and to the claims hereto appended and in which our invention is clearly pointed out.

In the manufacture of articles from sheet metal it often becomes necessary to apply an outwardly projecting annular flange of metal to a sheet metal tube or cylinder. To accomplish this, as heretofore practiced, a circumferential bead is formed upon the exterior of the cylinder at the desired distance from the end thereof to determine the location of said flange, and the flange is then slipped upon the end of said cylinder and into contact with said bead in which position it has to be secured by soldering. This soldering was liable to break away particularly when the flange was made of thin sheet metal and only came in contact with the cylinder at its thin edge. To overcome this objection we have invented the improved beading machine illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is an end elevation. Fig. 3 is a partial sectional elevation illustrating the construction of the bed roll adapted to use in securing in position on the cylinder flanges of considerable and different thicknesses, or that have bearings upon said cylinder of considerable lengths, and Fig. 4 is a central longitudinal section of a cylinder of sheet metal with an annular chamber surrounding the same all formed from sheet metal, and is shown in order to illustrate the use of our improved beading machine.

In the drawings A is the frame of the machine, in fixed bearings in which is mounted the shaft B having secured upon one end the crank C and within said casing a spur gear wheel not shown.

D is a shaft mounted in a bearing pivoted at *a* to said frame or casing, about which pivot said bearing and shaft may be moved to a limited extent by the screw *b*, to separate the beading rolls, to permit the insertion of the work, and close them again upon the work, said shaft D having secured thereon, within said casing, a spur gear which is engaged by the gear on the shaft B in a well known manner.

E is a gage mounted upon the rod *c* the opposite end of which is threaded to fit the interior of the sleeve *d* which in turn is threaded in a bearing in the frame A and has fitted thereon the check nut *e*, by which said gage may be adjusted to any desired distance from the operating portions of the beading rolls.

So far the machine illustrated is of well known construction and not of our invention and therefore no more detailed description of the parts hereinbefore named need be given here.

The shaft B has secured upon the end thereof opposite to the crank C the bed roll F having formed upon its periphery the two annular beads *f* and *g* in close proximity to each other, and having their outer edges substantially semi-circular in cross section as shown.

The shaft D has secured upon its front end the roll or disk G having formed thereon a nearly semi-circular circumferential groove *h* so arranged thereon as to receive and fit upon the bead *f* on the roll F when said disk G is depressed to its lowermost position by the action of the screw *b*, and so that the front outer corner of said disk shall present a sharp or nearly knife edge *i* having a diameter slightly less than the diameter of said disk G on the opposite side of said groove *h* which will enter the sharp angular groove between said beads *f* and *g* when said disk is depressed as above stated.

It is necessary that the knife edge *i* should have a diameter slightly less than the diameter of that portion of the disk G which is

upon the inside of the groove *h*, for the reason that otherwise there would be danger of the metal being cut thereby, and the bead *p* when formed would not be in close contact with the flange N, and would not hold said flange firmly in place on the cylinder L. (See Fig. 4.)

Both beads *f* and *g* may form integral parts of the bed roll F as shown in Fig. 1, or the bead *g* may be formed upon the edge of a separate disk H and secured to the shaft B so as to be adjustable thereon to a greater or less distance from the bead *f* according to the thickness of the flange to be secured upon the sheet metal cylinder L, see Fig. 4, or the length of bearing it has thereon. In this case the shaft B is extended beyond the outer face of the roll F, with a reduced diameter and has formed on said extension a right hand screw thread to fit a correspondingly threaded hole in the disk H and has fitted thereto outside of said disk the check-nut I by which said disk H may be firmly clamped in the proper adjusted position, and the bed roll F is fitted to a left hand male screw thread formed upon said shaft B and is screwed up hard against a shoulder *j*, while the disk G is similarly secured upon the shaft D but by a right hand thread. By this arrangement of the threads for securing the roll F and disks G and H to the shafts B and D, the resistance to the passage of the work between said roll and disks, the shaft being always revolved in the directions indicated by the arrows on Fig. 2, will tend to clamp said roll and disks more firmly to said shafts.

In Fig. 4 is represented a sheet metal cylinder L surrounding which is an annular chamber formed by the two annular rings of sheet metal M and N each struck up into the form of a flaring cup with a hole through its bottom corresponding to the exterior diameter of the cylinder L, one of said cup like rings having a short cylindrical flange *m* struck up around the opening in its bottom of such an interior diameter as to accurately fit the exterior diameter of said cylinder.

The ring N is inverted and has a bearing upon the cylinder L only equal to the thickness of the metal of which said ring is made, said two rings being united at *n* as shown.

To properly unite the rings M and N to the cylinder L by our improved machine the operation is as follows:

The cylinder L is formed in any well known manner and then by the use of the ordinary and well known beading machines now in use the beads *o* and *o'* are formed around said cylinder at the proper distances from the ends thereof. The ring N is then slipped upon the upper end of said cylinder and pressed against the bead *o*, when the upper end of said cylinder is placed between the roll F and the disk G, with the beads *f* and *g* in the positions shown in Fig. 1, whether made in one piece or separate, and the disk G is pressed down upon the material of said cylinder with its outer flat face in close proximity to the portion of the ring N which is at right angles to the periphery of said cylinder, when if the shafts B and D be revolved in the directions indicated by the arrows on Fig. 2 the bead *p* will be formed just outside of said ring N and in close contact therewith and that portion of the cylinder between the beads *o* and *p* will be slightly expanded and pressed into close contact with the inner edge of said ring thus firmly clamping said ring in position on said cylinder so that it cannot be moved endwise of, or circumferentially about, said cylinder, and very little soldering will be required to render the joint air or liquid tight and there will be no tendency to break away from said soldering.

When the bead *p* is being formed the edge of the bead *g* on the roll F rolls in the groove formed in the interior of the cylinder A when the bead *o* is thrown out.

If a ring or flange of considerably greater thickness or having the cylindrical flange *m* thereon is to be secured to a cylinder as illustrated by the ring M it becomes necessary that the disk H having the bead *g* formed on its edge should be adjusted to a distance from the bead *f* on the roll F equal to the desired distance between the bead *o'*, already formed in the cylinder L, and the bead *p'* to be formed therein, when the ring M being placed in position on the cylinder L with the edge of the cylindrical flange *m* in contact with the bead *o'* formed on the cylinder and the projecting portion of the cylinder is passed over the roll F with its axis parallel with the axial line of the shaft B but eccentric thereto with its upper side portion resting upon the beads *f* and *g* and the disk G is pressed down upon said cylinder by the screw *b* so as to grip the metal of said cylinder between the roll F and disk G, and the shafts B and D be revolved as before the bead *p'* will be thrown out around said cylinder and firmly clamp said ring between the beads *o'* and *p'* as shown.

The roll F and disk G may be secured to their respective shafts by being screwed thereon as shown in Fig. 3, or in any other suitable manner, and the crank C may be secured upon either of the shafts B or D without affecting the principles of our invention.

What we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a tinsmith's beading machine the combination of two rotary shafts geared together and means for raising and lowering one of said shafts; a work support secured upon one of said shafts and provided with two circumferential beads or rounded edged projections; and a disk or roll secured upon the other of said shafts and having a circumferential groove having a cross section to conform to and arranged to engage with the rounded edge of the inner one of said beads, and forming at its outer peripheral corner a knife edge to enter the space between said two beads.

2. In a tinsmith's beading machine the combination with a cylinder supporting bed roll having two circumferential beads or rounded projecting surfaces, the outer one of which is adapted to enter the hollow of a previously formed bead of said cylinder; of a co-operating roll or disk having a circumferential groove to fit the inner one of said beads and forming an annular knife edge at its outer end of a diameter somewhat less than the diameter of said roll or disk on the inner side of said groove.

3. In a tinsmith's beading machine, the combination with two rotary shafts and means for revolving said shafts in unison, of a work support made in two parts, each provided with a circumferential bead or round edged projection, and mounted upon one of said shafts one part being fixed thereon and the other adjustable lengthwise thereof; and a disk or roll secured in a fixed position to said other shaft, and having formed thereon a circumferential groove contiguous to the front face of said disk or roll and forming with said front flat face an acute angle or a knife like circular edge.

4. The combination of the shafts B and D; the roll F provided with the circumferential bead *f* contiguous to its front end face and secured in a fixed position on said shaft B; the disk H having a rounded peripheral edge and screwed upon the threaded front end portion of said shaft B; the check-nut I; the disk G provided with the circumferential groove *h*, and the peripheral knife edge *i* having a diameter less than the diameter of said disk at the other side of said groove; and means for revolving said shafts in unison.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 19th day of December, A. D. 1894.

FRANK A. HADLEY.
HENRY F. L. DANFORD.

Witnesses:
N. C. LOMBARD,
WALTER E. LOMBARD.