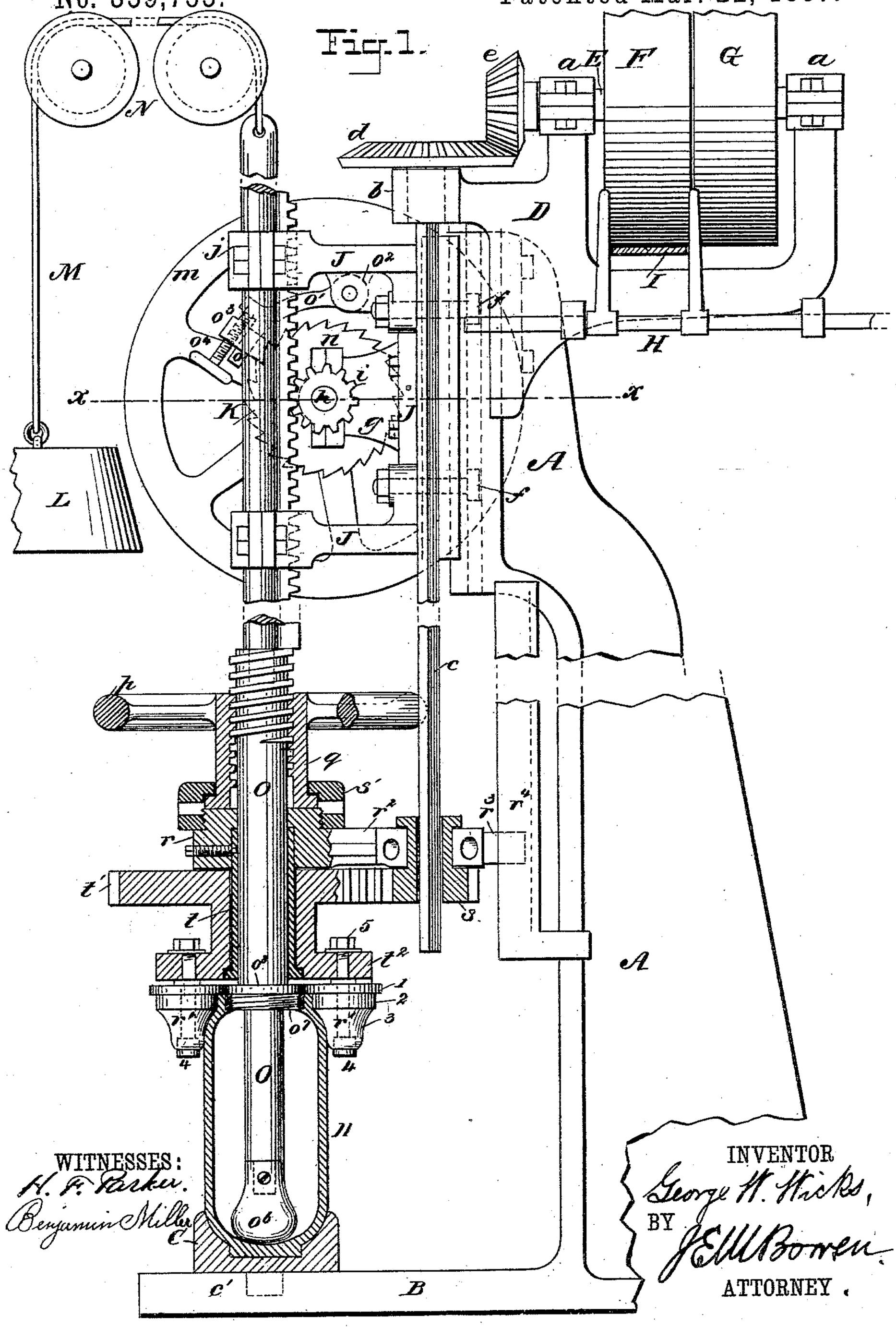
(No Model.) 2 Sheets—Sheet 1.

G. W. WICKS.

MACHINE FOR FORMING PLUMBERS' TRAPS.

No. 359,755. Patented Mar. 22, 1887.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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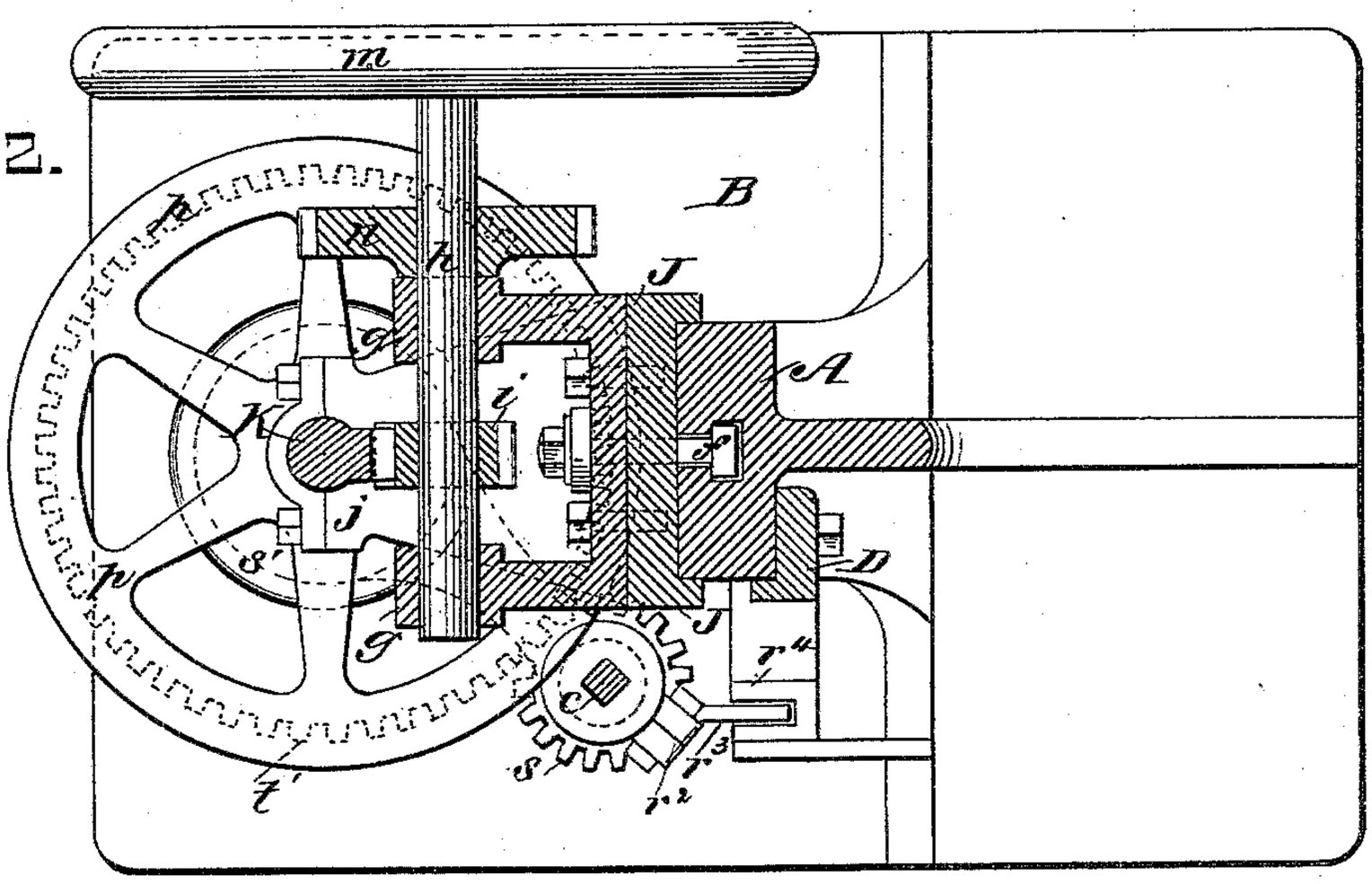
Fig. 2.



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MACHINE FOR FORMING PLUMBERS' TRAPS.

SPECIFICATION forming part of Letters Patent No. 359,755, dated March 22, 1887.

Application filed August 11, 1886. Serial No. 210,658. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. WICKS, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Apparatus for Manufacturing Plumbers' Traps, of which the following is a specification.

This invention has reference to mechanism for producing what are known as "plumbers' traps," and particularly that type of trap which comprises an elongated cylindrical vessel having a contracted mouth provided with a female screw-threaded nut adapted to receive a screw-threaded cap. Traps of this description have their body portion of soft metal and the cap and screw-threaded nut within the neck of brass. Ordinarily the soft-metal body is fashioned by hand with the tools adapted for giving shape to soft-metal hollow bodies. When thus made, the traps are expensive, and, because of the solder joints which they embody, oftentimes unreliable for the purposes intended.

I have filed in the United States Patent Office applications for patents setting forth mechanism for casting the trap-body, and modes and means for finishing the surface of the casting and rendering the same free from porosity.

The object of the present invention is to devise an apparatus whereby the mouth of the cast and compressed trap-body may be fashioned into a suitably-contracted neck and the female nut, or nut and washer, secured therein; and the invention accordingly consists in an apparatus of peculiar construction adapted to perform the functions in question by cold pressure without the interposition of heat.

The novel features and combinations for which protection is desired in this instance are specified in the claims at the end of this specification.

In the accompanying drawings, which form part of this description, and in which like features are indicated by like letters, Figure 1 is a side elevation, partly in section, of my apparatus for finishing the incomplete cast trap-body, showing a finished trap in the position in which it has been operated upon by the neck-shaping mechanism; and Fig. 2 is a cross-section through the line *x x* of Fig. 1.

Referring to the drawings, the letter A indicates the cast-iron frame of the machine, which preferably is of the form shown in Fig. 1, and is provided with a lateral extension, B, at its base, which has a depression therein for the reception of the projection *c'* on the bottom of the cast-iron die C. The die C has its interior so shaped as to conform exactly to the exterior of the bottom of the cast trap-body, in order to furnish a substantial rest therefor during the process of finishing the mouth of the trap.

The top of the frame A is provided with a bracket, D, which furnishes bearings for the journal E, which carries the pulleys F G, through the intervention of which and suitable belting power is communicated to the apparatus. The pulley F is fast upon the shaft E, while the pulley G is loose thereon.

H is a shipper, which operates in the usual manner to start or stop the apparatus by shipping the belt I from one pulley to the other, in an obvious manner.

The shaft E is journaled at *a a*, and has rigidly affixed to its projecting end the pinion *e*, which meshes with the bevel-wheel *d*, the hub of the latter being seated and adapted to turn in the projection *b* on the bearing D.

J is a sliding head, which is secured to the upper part of the frame A in an adjustable manner by the bolts *f*. The outer portion of the head J is provided with guides *j* for the rack-bar K, which may move up and down therethrough.

The letter *h* indicates a shaft journaled in boxes *g*, and carrying at one of its ends the hand-wheel *m*. Mounted upon the shaft *h*, between the journal-boxes *g g*, is a pinion, *i*, adapted to mesh with the teeth of the rack-bar K. By this means the rack and mechanism carried thereby may be raised or lowered independently of the means by which the apparatus is driven.

L is a counterbalance-weight, which enables the operating mechanism depending from the lower end of the rack-bar K, which is caused to travel downward by operating the hand-wheel *m*, as explained, to be easily elevated when it is desired to raise the same away from contact with the trap that has been operated upon. The weight L is secured to the rack-

bar K by a chain or cord, M, passing over pulleys N.

The letter *n* represents a ratchet-wheel rigidly mounted on the shaft *h* between the hand-wheel *m* and the journal-box nearest said wheel, and *o* represents a pawl arrangement, which comprises a curved arm, *o'*, pivoted to a projection, o^2, on the sliding head J, and a block, o^3, and screw o^4, which passes through said block o^3 and through a boss on curved arm *o'*. By this construction the pawl can be quickly adjusted to drop into the required tooth of the ratchet-wheel *n*. The object of ratchet-wheel *n* and its pawl arrangement is for the purpose of locking the hand-wheel *m* rigidly in position when a trap-body is being operated upon, so that the mechanism carried by the rack-bar K will be held steadily in the required position, and not be permitted to rise while the neck of the trap is being fashioned.

O represents a cast-iron follower, which is secured to the rack-bar K in the manner shown, or in any suitable manner. The upper end of follower O is screw-threaded, as shown. The lower end of follower O is provided with a detachable foot, o^6, having a curved bottom conforming to the curvature of the interior of the bottom of the trap, but sufficiently small to enable its withdrawal from the trap when the mouth of the latter has been perfected. The purpose of foot o^6 is to assist in maintaining the trap-body firmly in an upright position while undergoing operation by the mouth-shaping mechanism. The foot o^6 is made detachable, in order that several lengths of the same may be employed, and thus enable the follower to be lengthened or shortened, according to the depth of trap to be operated upon.

At a proper position on the follower, intermediate between its foot and upper end, there is formed a cylindrical enlargement, o^7, above which is a collar of greater diameter, o^8. The enlargement o^7 is somewhat less in diameter than the diameter of the mouth of the trap will measure when perfected. The circumference of enlargement o^7 is provided with screw-threads, which enable the brass female screw-threaded ring which is to be secured in the mouth of the trap to be firmly held in place while the process of compressing the trap's mouth thereupon is being performed. The metallic washer which I propose to secure in the mouth of the trap above the screw-threaded nut may be slipped onto the enlargement o^7 previous to screwing the nut thereon.

The letter *t* indicates a brass bushing fitted upon the follower O and keyed to the hub *r*. This bushing receives the gear-wheel *t'* and the plate t^2, which latter carries the rollers *r'*, the said bushing *t* furnishing a bearing for the gear-wheel and plate, as is apparent from the drawings. The hub *r* is provided with an arm, r^2, which carries the pinion *s*, which meshes with the gear-wheel *t'*.

The letter *q* indicates a sleeve screw-threaded internally, provided with the hand-wheel *p*, and fitting upon the screw-threaded top of the follower O. The nut *s'* is provided with an interior shoulder, which rests upon the flange at the lower end of the sleeve *q*, and the lower end of said nut *s'* screws onto the upper portion of the hub *r*, thereby being firmly secured to the hub. The lower end of the brass bushing *t* and the interior of the hub *r* are provided with shoulders, which serve as bearings, respectively, for the gear-wheel *t'* and hub *r*.

By the above-described mechanism the mouth-shaping rollers are capable of being elevated or lowered independently of the mechanism by which the rollers are revolved, (and independently of the mechanism by which the follower O and rack-bar K are elevated and lowered,) as it is plain that by turning the hand-wheel *p* in the proper direction the sleeve *q*, hub *r*, and its arm and attached pinion, with the gear-wheel *t'*, bushing *t*, and the rollers, are raised or lowered upon the follower O.

The pinion *s* is supported and guided by the projection r^3, extending from the hub of the pinion into a slot in the brace r^4, secured to the frame of the machine.

The rod *c* is square in cross-section, is secured in the hub of the bevel-wheel *d*, and passes through a square hole in the hub of the pinion *s*. By this means the pinion *s* may slide up and down on the rod *c* in the operation of raising or lowering the roller mechanism through the instrumentality of the hand-wheel *p*, and when the shaft E is caused to revolve the rod *c*, being fast in the hub of the bevel-wheel *d*, also revolves, and as the hole in the pinion *s* is square said pinion necessarily revolves with the rod *c*, and consequently causes the gear-wheel *t'*, with which the pinion *s* meshes, and which carries the series of rollers, to revolve likewise.

Five (more or less) of the rollers *r'* may be employed, and their function is to give shape to the mouth of the trap and compress the lead around the female screw-threaded nut and metallic washer. The rollers *r'* are so shaped upon their surface as to give the required finish and form to the neck of the trap. At the top of the roller is the flange 1, of a width sufficient to overlap the top edge of the trap, and its surface 2, just below the flange 1, is cylindrical and perpendicular, to properly shape the exterior of the neck of the trap, while below the perpendicular portion 2 the roller is curved inwardly, as at 3, to properly shape the shoulders of the trap below its neck. The rollers are secured to the flange t^2, Fig. 1, by means of headed spindles 4 and nuts 5. By this means the rollers may be accurately adjusted upon the plate t^2, and rendered capable of revolution independently of one another.

The manner of using this mechanism is as follows: The trap-body 11, as it comes from the casting or drawing mechanism in its incompleted form, is placed in the die C, the rack-bar K being elevated by the hand-wheel *m*, so as to carry the foot o^6 of the follower O above the upper end of the trap-body. In

lowering the follower into the trap, which is done through the instrumentality of the hand-wheel *m*, the rollers are elevated by means of the hand-wheel *p*, in order that when the foot of the follower is firmly seated in the bottom of the trap the rollers are away from contact with the trap's mouth. In this position the pawl mechanism *o* is adjusted so as to become locked in the ratchet-wheel *n*, thereby holding the wheel *m* rigidly, and consequently insuring the maintaining of the foot of the follower in a stationary position within the trap. As thus adjusted, the enlargement 7 of the follower O occupies a position directly on a line with the neck of the trap-body, and the collar o^8 above the enlargement o^7 occupies a position with its lower surface in about the same plane as the top surface of the mouth of the trap. As a preliminary operation, before the follower O is lowered into the trap-body its screw-threaded enlargement o^7 is supplied with a female screw-threaded nut and metallic washer, (when the latter is to be used in conjunction with the nut,) which is done by slipping the washer over the enlargement and screwing the nut onto said enlargement. Thus equipped, the follower is lowered into the trap-body in the manner already explained, and through the medium of the shipper power is applied to revolve the rod *c*, and with it the pinion *s* and gear-wheel *t'*, with the series of revoluble rollers attached to the flange of its hub. As the rollers revolve around the follower O they are slowly fed downward by means of the hand-wheel *p*, and coming in contact with the mouth of the trap-body 11, they begin to revolve upon their own axis as they move bodily around the said trap. The speed of the downward movement of the rollers is under the control of the operator.

By the described shape of the rollers r' the desired conformation is given to the neck of the trap, and at the same time the lead of the trap's mouth is firmly compressed upon the nut and washer located upon the enlargement o^7 of the follower O. By the flanges 1 of the rollers r' the top edge of the trap's mouth is smoothed and compressed during the revolution of the roller mechanism.

When the desired finish has been produced upon the mouth of the trap, which requires but a few seconds, the hand-wheel *p* is turned in the reverse direction, with the effect of elevating the rollers away from the trap's mouth, and the pawl arrangement being released, through the medium of hand-wheel *m*, the follower O is quickly lifted with the trap sufficiently high to permit the trap to be unscrewed and replaced by another trap-body for treatment. These manipulations may be performed without stopping the revolution of the rollers, as is obvious.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The trap-supporting die C, having curved side walls and a flat bottom, substantially as set forth.

2. The frame A, provided with a lateral foot, B, having a depression, combined with the die C, having a central projection on its bottom, and the follower O and means for raising and lowering the latter, substantially as set forth.

3. The frame A and sliding head J, having guides *j j*, combined with the rack-bar K and means for operating the latter, and the follower O, substantially as set forth.

4. The follower O, provided with the detachable foot o^6, substantially as set forth.

5. The follower O, having a screw-threaded enlargement, o^7, and a curved foot-piece, substantially as set forth.

6. In combination with the follower O, provided with the bushing *t*, the flange t^2, a set of shaping-rollers, as r', and gearing for operating the same, substantially as set forth.

7. The follower O, provided with the bushing *t*, in combination with a series of shaping-rollers revolubly connected to the flange t^2, and gearing for operating the same, substantially as set forth.

8. A series of shaping-rollers, as r', each provided with a flange at its top, a perpendicular cylindrical surface below said flange, and an inwardly-curved surface below said perpendicular portion, substantially as set forth.

9. The follower O, provided with the gear-wheel and series of shaping-rollers, as shown, combined with the pinion *s*, square rod *c*, and means for revolving said rod, substantially as set forth.

10. The follower O and series of rollers, as r', combined with the hub *r*, sleeve *q*, and hand-wheel *p*, substantially as set forth.

11. The follower O, screw-threaded at its upper end, flange t^2, and the rollers r', combined with the hub *r*, having an arm, r^2, nut s', sleeve *q*, and wheel *p*, substantially as set forth.

12. The follower and its foot o^6, combined with the rack-bar K, pawl-and-ratchet arrangement *n*, and hand-wheel *m*, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 19th day of July, A. D. 1886.

GEO. W. WICKS.

Witnesses:
J. E. M. BOWEN,
HUGO KOELKER.