

(No Model.)

M. D. CONVERSE.
NAIL EXTRACTOR.

No. 432,019.

Patented July 15, 1890.

FIG. 1.

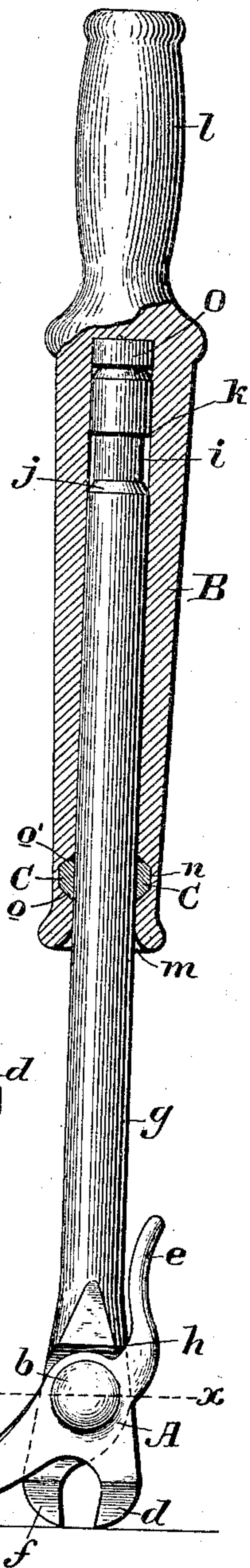


FIG. 7.

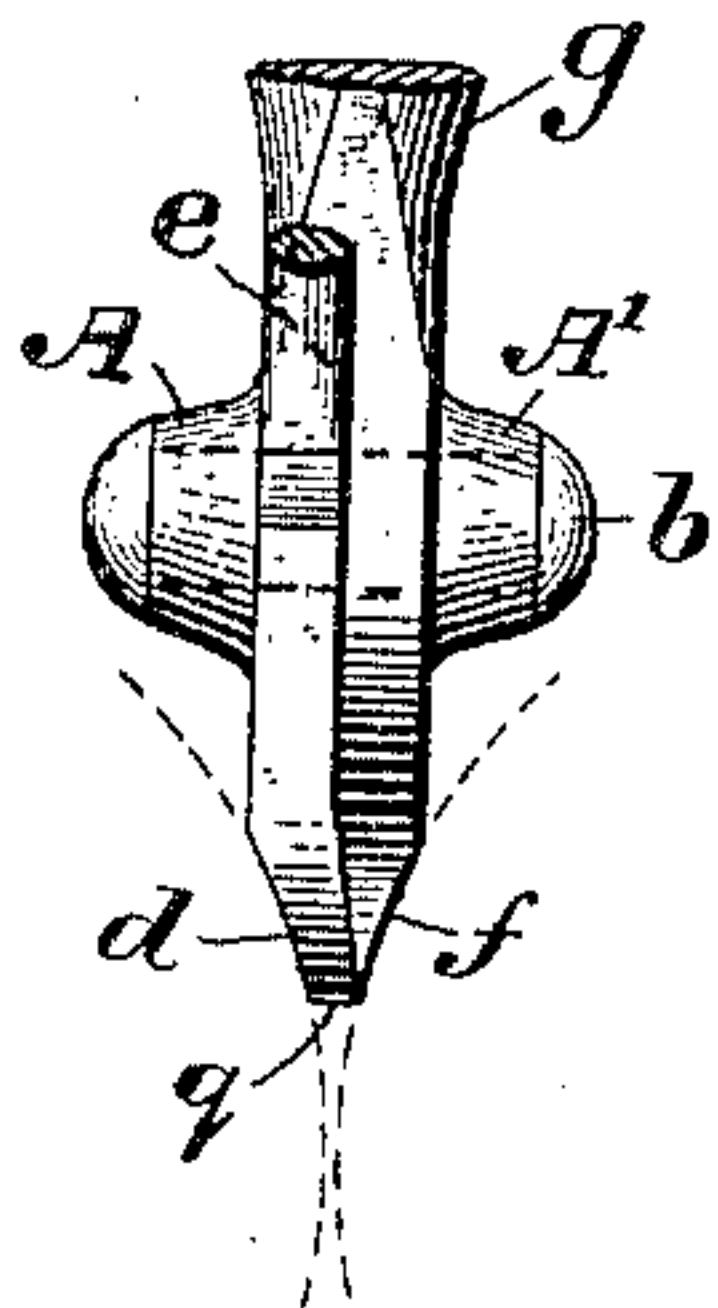


FIG. 2.

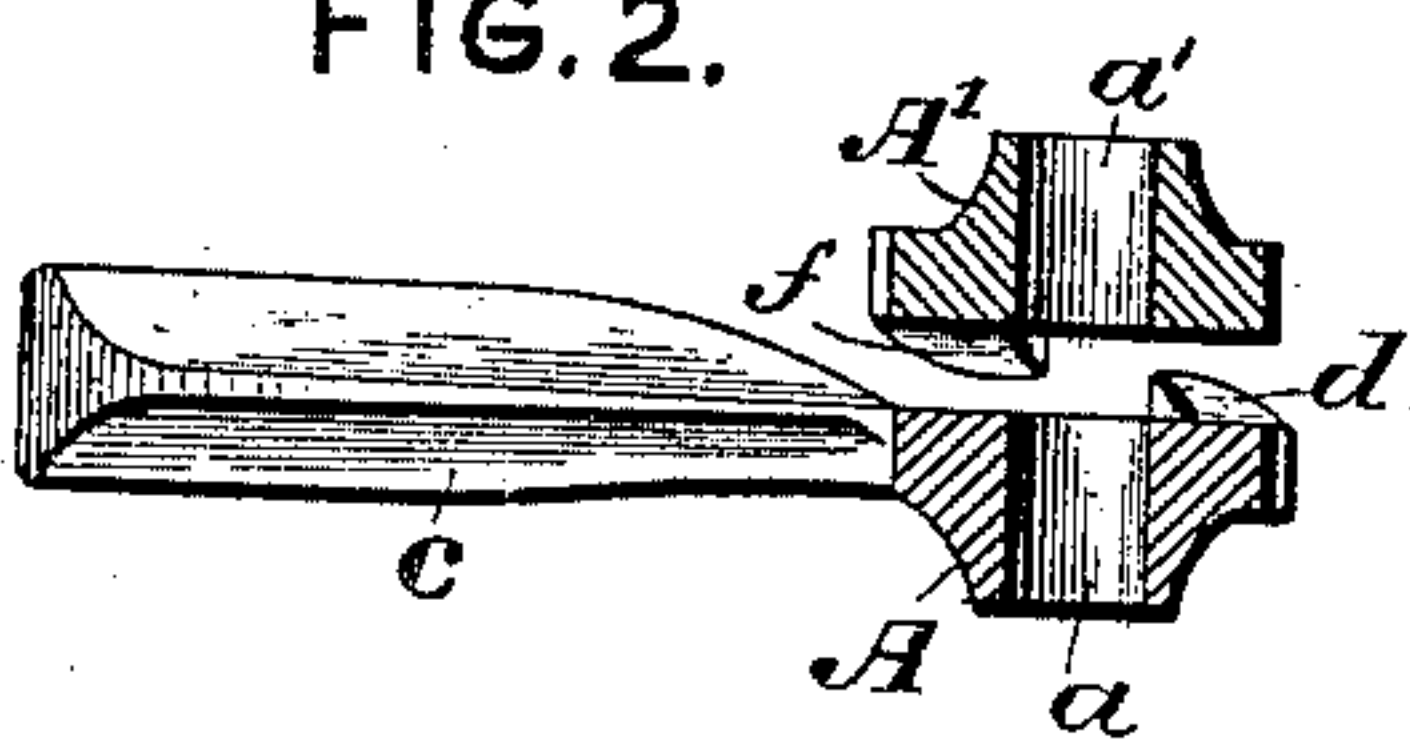


FIG. 3.

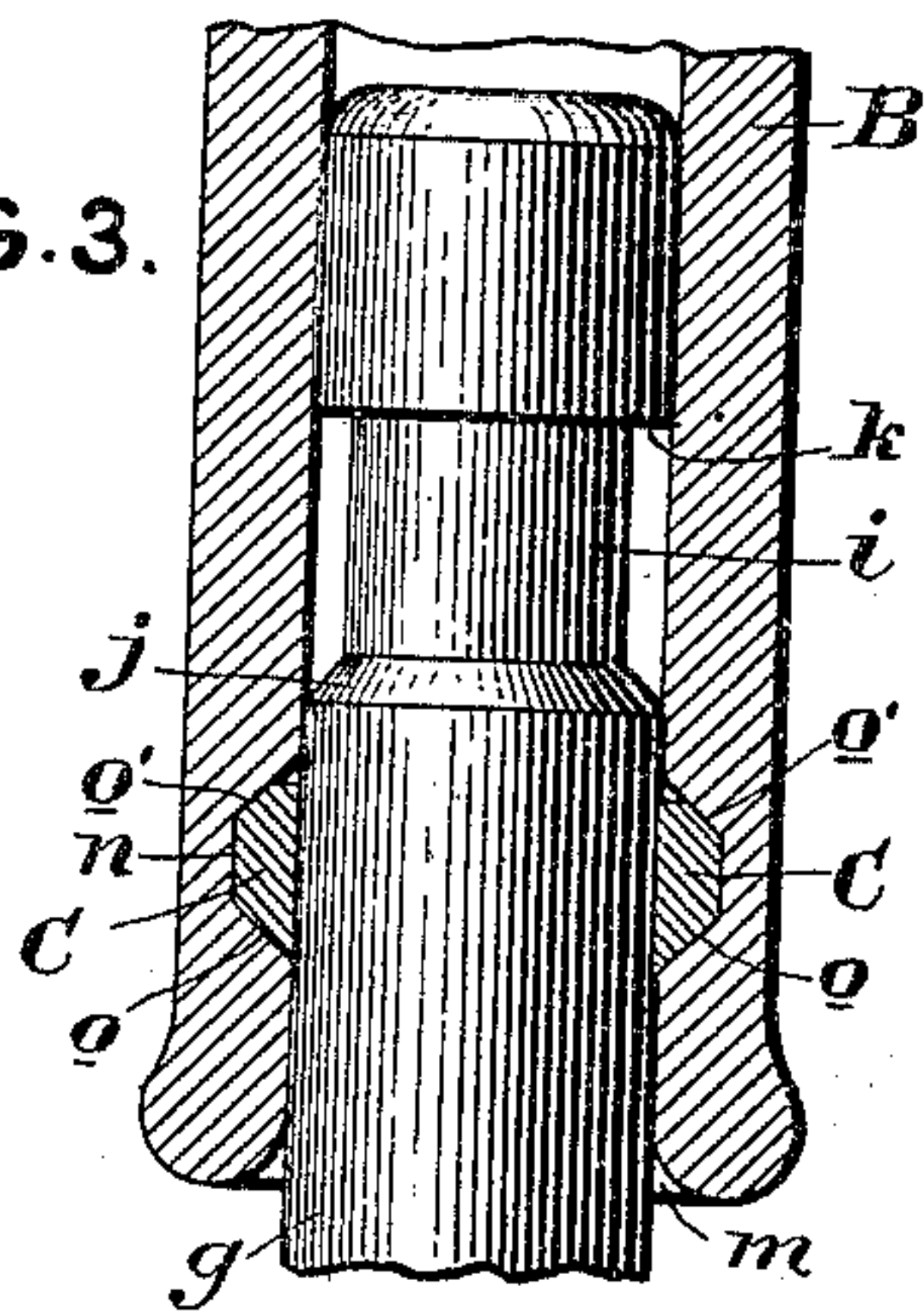


FIG. 4.

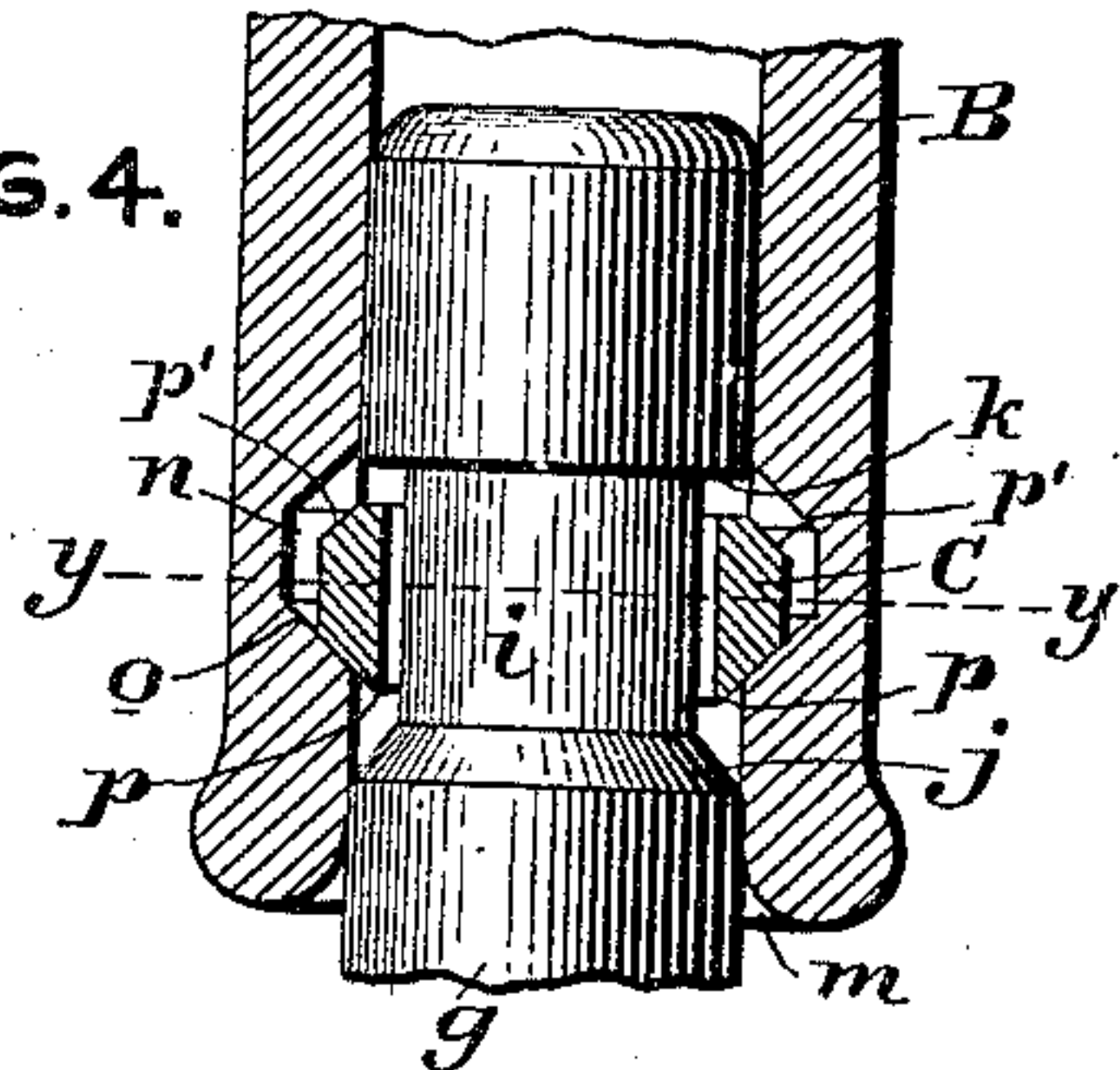


FIG. 5.

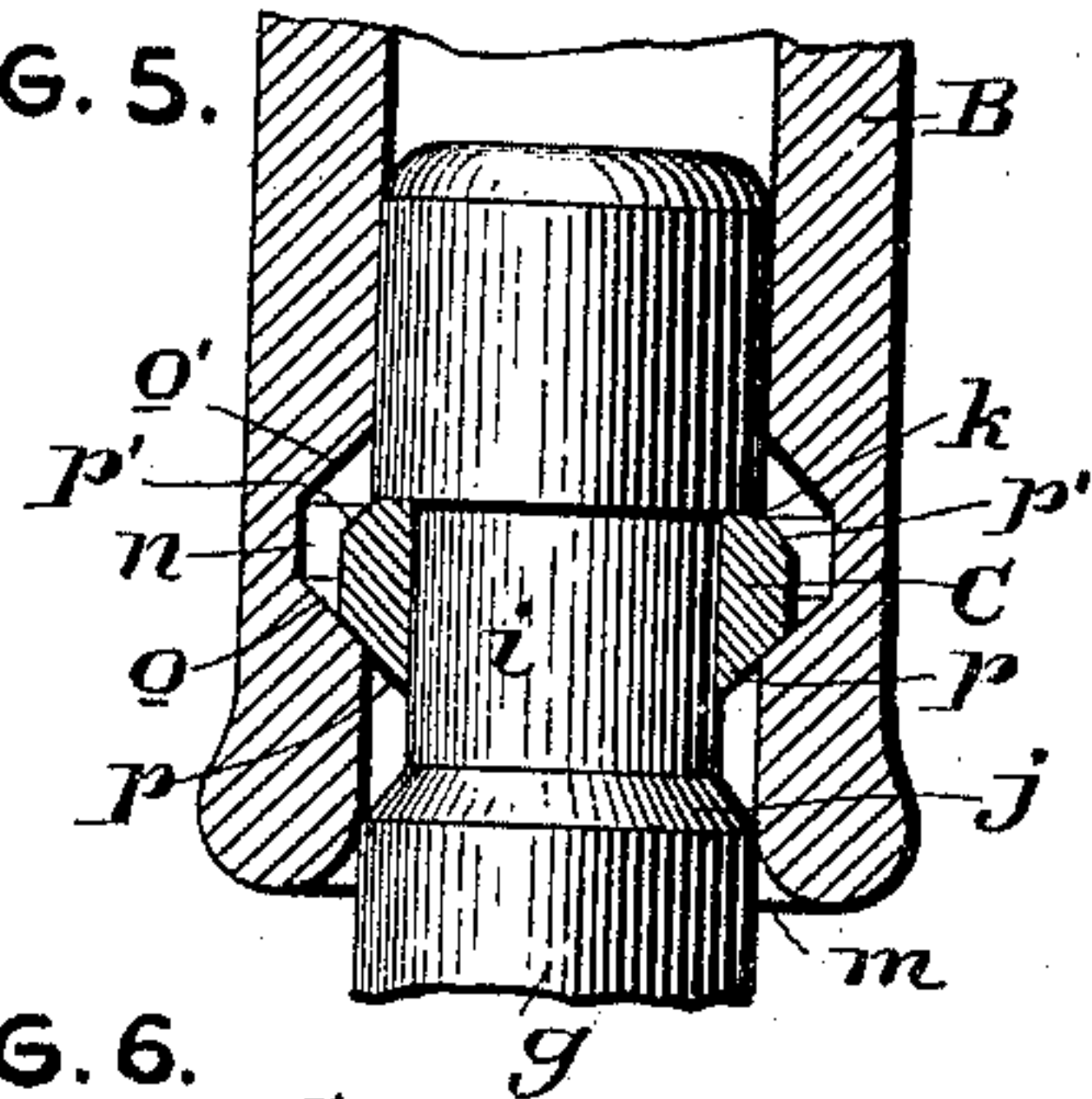
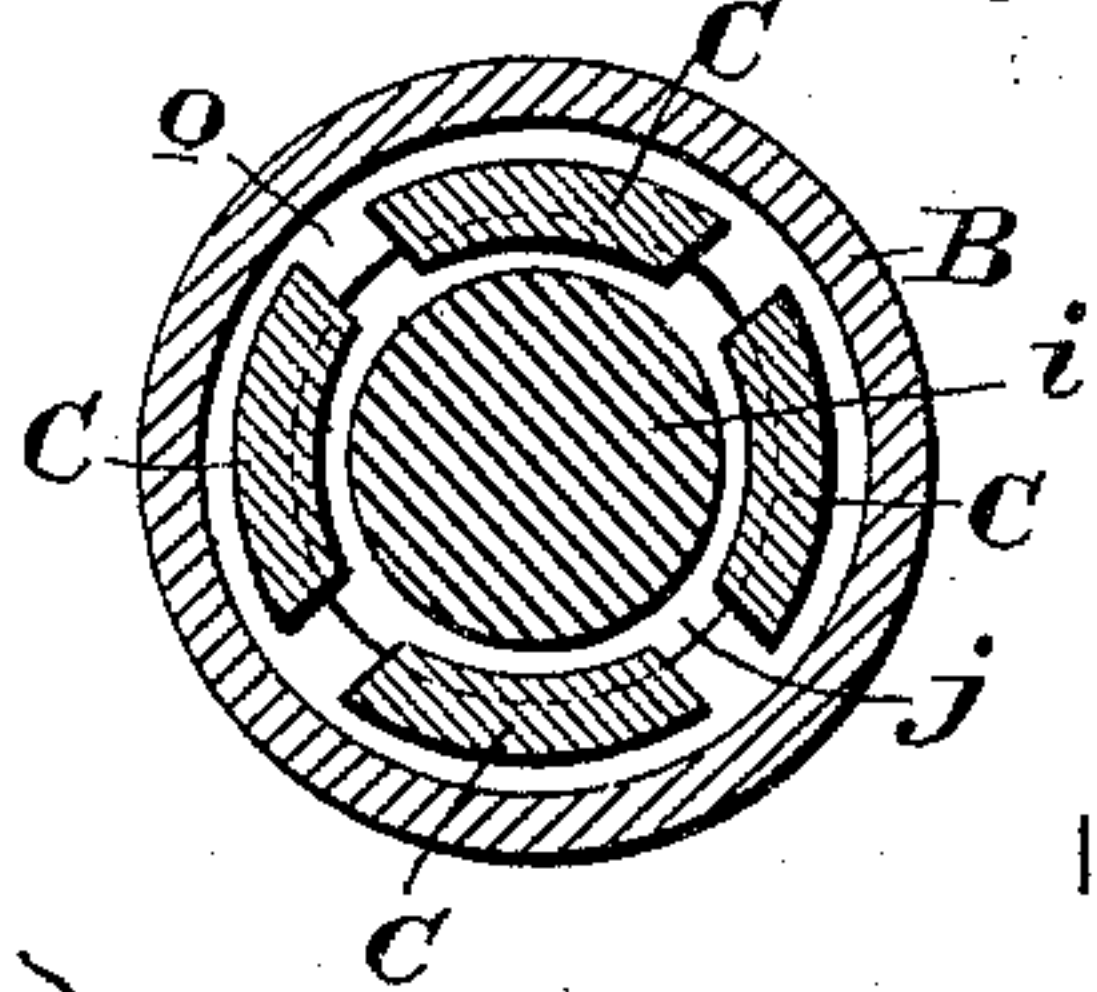


FIG. 6.



INVENTOR

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ATTEST

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MASCHIL D. CONVERSE, OF NEW YORK, N. Y.

NAIL-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 432,019, dated July 15, 1890.

Application filed December 12, 1889. Serial No. 333,386. (No model.)

To all whom it may concern:

Be it known that I, MASCHIL D. CONVERSE, of the city, county, and State of New York, have invented an Improvement in Nail-Extractors, of which the following is a specification.

My invention relates to nail-extractors, and more particularly to that class of which Letters Patent Nos. 143,496 and 243,812 are examples. In practice, as is well known to users thereof, nail-extractors of this type have proven defective principally in the following respects: First, they are noisy in operation; second, they lack the rigidity desirable in the several connections of parts; third, they frequently injure the hands of the operator when using them by catching, pinching, or cutting the flesh or skin of the same between the stem and the surface of the lower inner edge of the ram; fourth, the springs become deranged or broken and the tools disabled thereby; fifth, their pivotal rivets and adjacent parts do not long withstand the concussion and strain communicated incident both to the operations of driving their jaws into the wood and of gripping and extracting nails, and consequently the gripping-points of their jaws soon get out of "register" or alignment with each other, having a lateral or wobbling movement, and thus fail to grip a nail promptly or altogether by slipping around it, to the injury also of the jaw-points themselves, which thus are rapidly worn away. The force of blows from the ram required to embed the jaws being communicated through the pivotal rivet to one of the latter, combined with the more destructive strains on this rivet incident to grasping and pulling nails, each operates upon opposite sides of, and tend to quickly batter, tilt, and bend the rivet and wear it away, and also to stretch and wear its socket-holes out of true shape, with the results just above named. In some nail-extractors an effort has been made to remedy this defect, with partial success, by making a close contact between the upper rounded edge of the movable jaw and the overhanging shoulder of the stem; but the greater concussion and consequent wear to the pivotal contact-surfaces resulting from the operations of gripping and extracting nails was still unguarded against.

My present invention relates to improvements for overcoming the foregoing defects and for making a more durable, efficient, and convenient nail-extractor at small cost, which objects I attain by the mechanism, devices, and combinations herein fully set forth and claimed.

In the drawings, Figure 1 is an elevation, partly sectional. Fig. 2 is a plan section of parts on the dotted line *xx*. Figs. 3, 4, and 5 are vertical sections. Fig. 6 is a cross-section on the dotted line *yy*, and Fig. 7 is an edge view of the lower end of Fig. 1 from the right hand.

Like parts are indicated by similar letters throughout the several figures.

A is a projecting hub immediately surrounding an axial hole *a*, bored longitudinally through it to receive a pivotal rivet *b*, and provided with a fulcrum *c*, gripping-jaw *d*, and controlling or jaw-opening lever *e* radially, the latter extending upward parallel with, adjacent to, and rearward of the stem *g*.

A' is a projecting hub, of precisely similar shape, immediately surrounding an axial hole *a'*, bored longitudinally through it also to receive the pivotal rivet *b*, and provided with a gripping-jaw *f* and stem or prime lever *g* radially, the latter having stop *h* at its base and a neck *i*, incline *j*, and shoulder *k* near its top. Said device (the hubs A and A') is more particularly referred to hereinafter.

Of the parts just above named the following constitute what I term the "compound pivoted jaw"—viz., jaw *d*, jaw *f*, and rivet *b*, having fulcrum *c* and stem *g*.

B is a tubular ram telescoped cap-like on a portion of the stem *g*, having a handle *l* at its upper end, flared or bell-shaped mouth *m* at its lower end, and an internal annular groove *n*, with inclines *o* and *o'*, near the latter end.

C C are ram-retainers, and are segmental sections of a zone in form, having beveled edges, (indicated by *p* and *p'* in Figs. 4 and 5,) and are adapted to lie loosely in the annular groove *n*.

O is a plug, of rawhide or other suitable elastic substance of solid cross-section, for preventing metallic contact between the upper end of the stem *g* and the bottom or end of the bore in the ram B. The pivotal rivet

5 *b*, of relatively large diameter and sufficient length, is inserted entirely through the holes in the longitudinal axes of the projecting hubs *A* and *A'*, in which it fits snugly, and a head is then turned down on both its ends against the projecting ends of the said hubs. The gripping-edges of the jaws *d* and *f* now being in alignment with each other, as shown in Fig. 7 at *q*, the jaw-edges facing each other
 10 squarely, having been bent inwardly for such purpose, as shown in Figs. 2 and 7, are maintained in this their true position by the projecting hubs *A* and *A'*, (arranged on a common axial line transverse to the plane of action of the jaws *f* and *d*, and through which axis the pivotal rivet *b* is fitted and entered,) which afford rigid leverage resistance to tilting and bending strains on the said rivet, overcoming wear and consequent secondary
 20 concussion in these parts, and finally preventing all lateral play or wobbling motion to the gripping-edges of the said jaws through the agency of their respective outstanding ends acting on the extremes of the pivotal rivet *b*, bringing to bear on the latter a shearing strain only. These hubs *A* and *A'*, I make of
 25 as small diameter as possible, for two reasons specially—the one in order that there may be no superabundance of weight to oppose the action of the ram in the operation of driving the jaws into the wood, and the other so as not to obstruct the operator's view of the points of the jaws *f* *d*, and thereby prevent their expeditious adjustment astride the nail-head.
 30 The several parts having been assembled, as shown in Figs. 1 and 7, the operation of my invention is as follows: The nail-extractor is grasped by both hands, one on the handle *l* and the other (usually the left) on the stem *g*, the little finger or the little and the third fingers of the latter one, embracing the controlling or jaw-opening lever *e* with slight pressure. This will bring the base of the controlling-lever *e* round against the stop *h* and
 40 open the jaws *d* *f* to the position they occupy in Fig. 1 ready to stride a nail-head. The ram *B* is lifted vertically with the other hand, being free to move in that direction independently of the stem *g*, carrying with it the retaining-pieces *C* *C* in the groove *n*, which slide freely over the even surface of the stem *g*, as shown in Fig. 3, till the position shown in Fig. 4 is reached, when they are dumped into the space around the neck *i* of the upper end
 50 of the stem *g* by gravitating on the incline *o*, as shown in the same figure. Further movement brings the parts to the positions shown in Fig. 5. The retaining-pieces *C* *C*, having caught against the shoulder *k*, are impinged between it and the incline *o*, preventing separation of the ram *B* and stem *g*. The ram *B* is now forced downward, and the retaining-pieces *C* *C* are pushed back into the groove *n* by the incline *j* on the stem *g*, and the blow is delivered and the jaws *f* *d* driven into the wood
 65 with little attending noise—a result due to the smooth easy movement between the contact-

surfaces of the ram and the stem, which fit fairly snug to the plug *O*, preventing metallic contact, and also to the projecting hubs *A* and *A'*, which prevent tilting and bending of the rivet *b* and secondary percussion at this point, as before mentioned and as will hereinafter further be shown. The full effective force of the blow is expended in embedding the jaws *d* and *f* in the wood beside a nail-head. No perceptible fraction of that portion required to drive jaw *d*, and which is communicated to it through the pivotal rivet *b*, is lost, even after long usage, since the strain on the rivet *b* is limited to a shearing one only, as before explained, by the action of the projecting hubs *A* and *A'* in their embracement of and rigid leverage support to the same. For the same reasons when the ram *B* and stem *g* are
 85 now violently inclined toward the fulcrum *c*, and a nail thereby is gripped and extracted, the shock and great strain incident are both sustained without damage to the axial fittings, and consequently no disturbance of the alignment of the jaws *d* and *f* and no slippage on the nail can take place.

Many persons in operating nail-extractors have sustained painful injury to the hands by having the skin and flesh caught between the edge of the lower end of the ram and the surface of the stem. (This point may be seen at *w* in Letters Patent No. 243,812, above referred to.) To prevent such accidents I make use of the device consisting of a flared or bell-shaped mouth *m*, (shown in Figs. 1, 3, 4, and 5,) which leaves so much space that the skin or flesh cannot be drawn in far enough to be out between the ram *B* and stem *g*. To this end, also, I purposely make the controlling
 105 or jaw-opening lever *e* short, so that in the necessity of embracing it to open the jaws the hand of the operator must be placed so low down on the stem *g* as to be out of reach of the lower end of the ram *B* in its extreme downward thrust.

In every position in which the nail-extractor may be held the ram-retaining device I make use of is operative, as will be seen by turning the drawings about and examining from different standpoints one or more of the pieces *C*, always dropping into position at the proper time.

I prefer to construct my nail-extractor with a close fit between the stem *g* and the inner wall of the ram *B* and make no lateral openings in the latter, so that when the ram is moved up and down air is drawn in and forced out along the crevice between the two with some difficulty. This, acting as a sort of cushion above, also contributes to reduce the sound of concussion.

Having described my invention, I claim as new, and desire to secure by Letters Patent, the following:

1. In a nail-extractor, the combination, with a tubular ram having a groove *n* and inclines *o* and *o'*, with hardened metallic pieces *C* inserted therein, of a stem provided with a

shoulder *k*, neck *i*, and incline *j*, substantially as and for the purpose shown and described.

2. In a nail-extractor, the combination of a stem having nail-extracting jaws with a tubular ram having a flared or bell-shaped mouth at *m*, substantially as and for the purposes shown and described.

3. In a nail-extractor, the combination of a stem *g*, having a stop *h* and jaw *f* on its lower end, with a fulcrumed jaw *d*, pivoted thereto, and provided with a short controlling or jaw-opening lever *e*, extending upward parallel with, adjacent to, and rearward of the stem *g*, substantially as and for the purposes shown and described.

4. In a nail-extractor, a stem *g*, having a projecting hub *A'* on its lower end bored longitudinally to receive rivet *b* and provided with a jaw *f*, in combination with a projecting hub *A*, pivoted thereto, also bored longitudinally to receive the same rivet, and provided with a fulcrum *c*, jaw *d*, and controlling or jaw-opening lever *e*, the latter extend-

ing upward parallel with, adjacent to, and rearward of the stem *g*, substantially as and for the purposes shown and described.

5. In a nail-extractor, a compound pivoted jaw having fulcrum and stem, when provided with solid projecting hubs *A* and *A'* on opposite outer sides immediately surrounding the pivotal rivet *b*, in combination with a percussive device or ram *B*, substantially as and for the purposes shown and described.

6. In a nail-extractor, a compound pivoted jaw having fulcrum and stem, when the latter is constructed with projecting hubs *A* and *A'* on the respective outer sides thereof transversely to the plane of action of said jaw, through the axes of which the pivotal rivet *b* is inserted, substantially as and for the purposes shown and described.

MASCHIL D. CONVERSE.

Witnesses:

JOHN T. ARMS,
ALVAH FISHER.