(No Model.)

2 Sheets—Sheet 1.

F. CHASE.

TACK DRIVER.

No. 356,620. Patented Jan. 25, 1887.

FIG. 1.

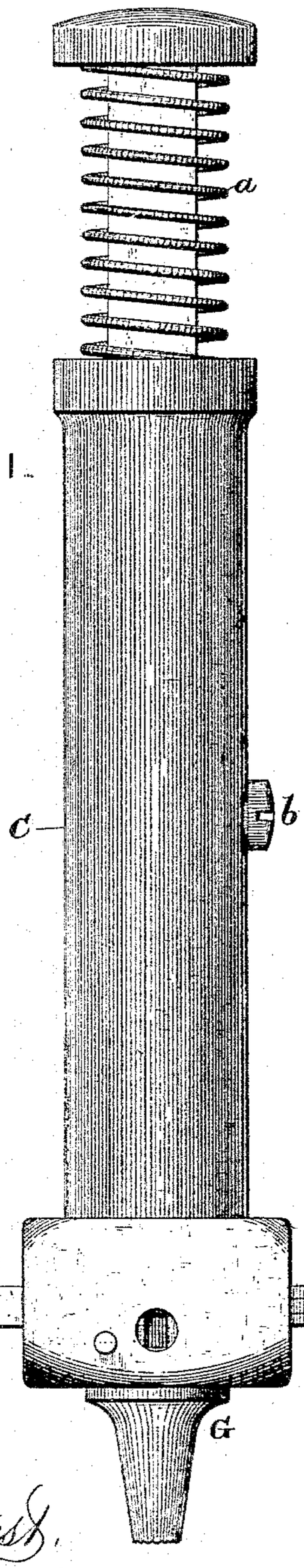


FIG. 2.

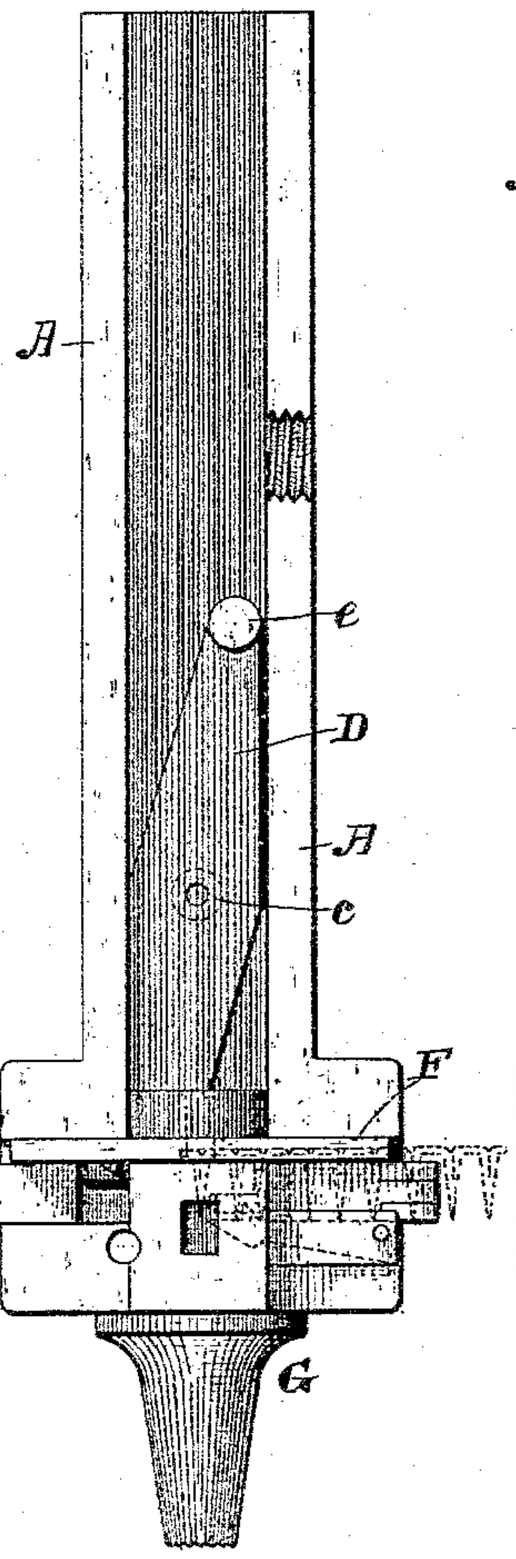
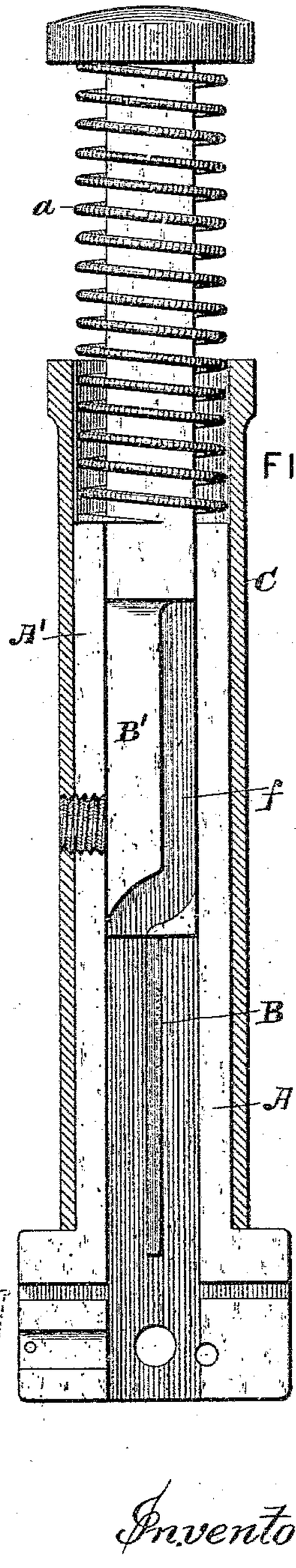


FIG. 3.



Attest.

Geo. T. Smallwood.

E. A. Dick

Inventor:

Frank Chase

By Marcellus Bailey Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

F. CHASE.

TACK DRIVER.

No. 356,620. Patented Jan. 25, 1887.

FIG. 4.

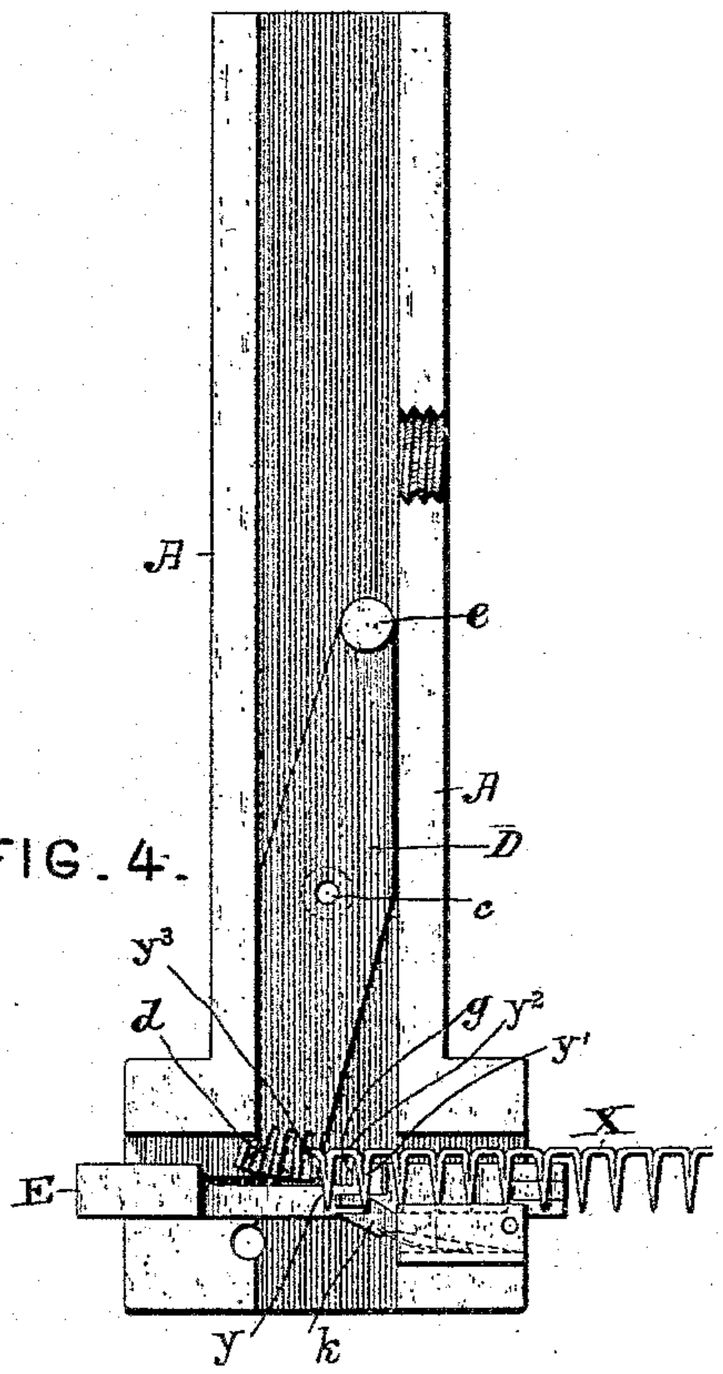


FIG. 5.

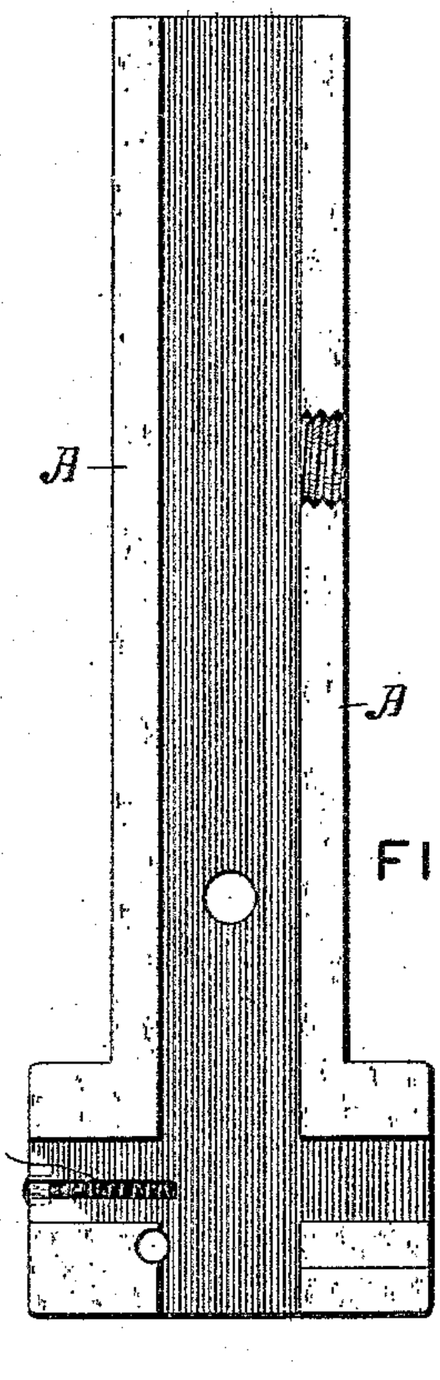


FIG. 8.

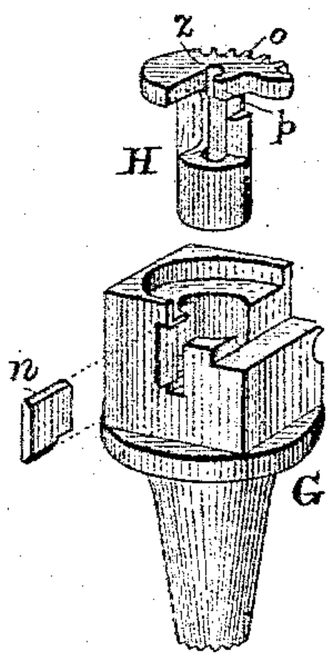


FIG. 6. FIG. 9.

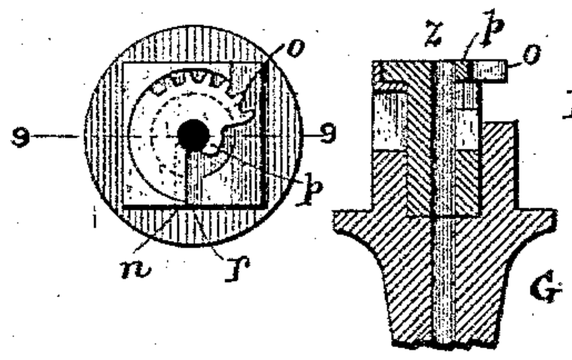


FIG. 11.

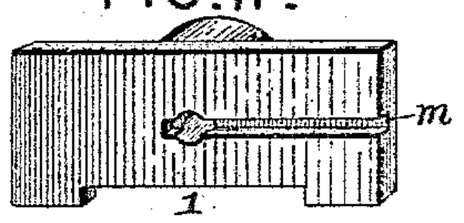


FIG. 14.

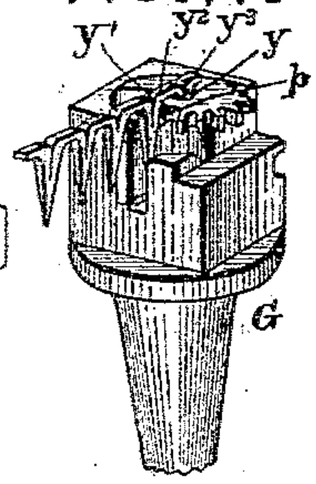


FIG. 12.

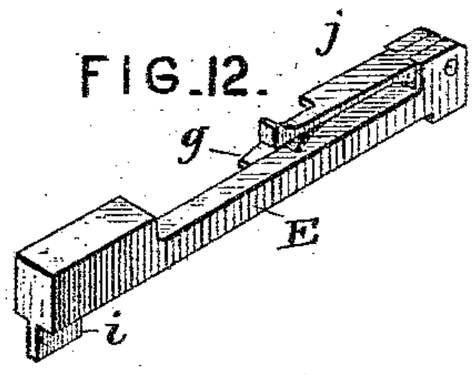


FIG. 7. FIG. 10.

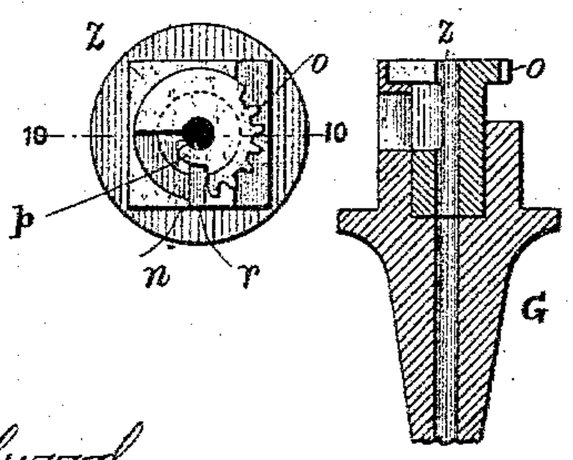
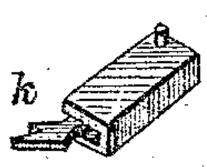


FIG. 13.



Attest:
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Inventor
Frank Chase
By Marcellus Bailey
Atty.

UNITED STATES PATENT OFFICE.

FRANK CHASE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE CHASE LASTING MACHINE COMPANY, OF SAME PLACE.

TACK-DRIVER.

SPECIFICATION forming part of Letters Patent No. 356,620, dated January 25, 1887.

Application filed September 21, 1886. Serial No. 214,169. (No model.)

To all whom it may concern:

Be it known that I, FRANK CHASE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Tack-Drivers, of which the following is a specification.

My invention has relation to drivers employed more particularly in shoe-lasting, and intended to be used in connection with a tack-strip consisting of a series of tacks connected together by their heads and arranged at regular intervals apart from one another—such a strip, for example, as illustrated in my Letters Patent No. 337,662, of March 9, 1886.

The main and essential feature of my invention resides in the combination, with a reciprocating punch or driver, of a rotatable die axially perforated for the passage of the punch, and formed both with a radial slot for the passage into the axial perforation of the front tack of the strip and with a horn or projection, which, when the die is rotated in the proper direction and to the proper extent, will close the feed-passage through which the tack-strip is fed, entering between the two front tacks and forming the cutting-edge, which co-operates with the punch to effect the severing of foremost tack from the body of the strip. For the purpose of accomplishing this operation, the die has a movement of partial rotation on its axis alternately in opposite directions, this movement being conveniently imparted to it by forming it with teeth or cogs upon its periphery, like those of a pinion, and engaging the teeth with an oscillatory or vibrating rack-bar, which is connected to and operated by the reciprocatory punch or driver stock. The rack-bar can also be availed of to operate the feed by which the tack-strip is intermittently advanced.

The nature of my invention and the manner in which the same is or may be carried into effect will readily be understood by reference to the accompanying drawings, which represent a tack-driver embodying my improvements in their preferred form.

Figure 1 is a side elevation of the driver. Figs. 2 and 3 are elevations of the two semicylindrical sections which form the inner core or stem. The core is represented as opened, with the inner faces of its halves exposed. The outer encircling shell or sleeve, which binds the two parts of the core together, is shown in section in Fig. 3. Fig. 4 is a view similar to Fig. 2 with the nozzle and the punch-guide removed so as to expose to view the feed and the toothed lower end of the rack-bar. Fig. 5 is a like view of the same part of the core with the feed and rack bar removed. Figs. 6 and 7 are top view or plans of the nozzle, showing the die in the two positions which it assumes. Fig. 8 is a perspective view of the nozzle, the die, and the key for holding the die in the nozzle, these parts being detached from one another. Fig. 9 is a section on line 9 9, Fig. 6. Fig. 10 is a section on line 10 10, Fig. 7. Fig. 11 is a perspective view of the punch-guide detached. Fig. 12 is a perspective view of the feed-bar detached. Fig. 13 is a perspective view of the detent which operates in connection with the feed. Fig. 14 is a perspective view of the nozzle with the foremost tack of the tack-strip in place in the die.

The core or hollow stem of the instrument is of cylindrical shape externally and is split in two longitudinally, the two halves being shown at A and A′, Figs. 2 and 3. The cylinder contains the punch B and punch-stock B′, the latter, for a portion of its length toward its upper end, fitting and adapted to slide up and down in the core, and being held up by a spring, *a*, interposed between its head and the top of the core. A sleeve or case, C, surrounds the core and holds it together. The two are fastened together by a screw, *b*, the inner end of which may form a stop for limiting the extent of longitudinal movement of the punch-stock. The lower end of the core is enlarged to form a block, which contains the die and the feed mechanism. Within the core is pivoted at *c* the vibrating rack-bar D, having a rack or toothed lower end, *d*, and provided at its upper end with a pin, *e*, which enters the cam-groove *f* in the punch-stock.

Seated in the lower end of the core is the sliding feed-bar E. This bar is provided with an abutment or shoulder, *g*, Figs. 4 and 12, against which the lower end of the rack-bar operates to push the bar back. The forward or feed movement of the bar is effected by a

spring, *h*, Fig. 5, seated in the block or core, against the head of which bears a lug, *i*, on the feed-bar. The spring is compressed by the rearward movement of the bar, and operates, when permitted to act, to force the bar in the opposite direction. Upon the bar is pivoted or attached a spring feed-pawl, *j*, having a beveled tooth on its front end, formed so that when the feed-bar moves back the pawl will ride by the tacks of the tack-strip X, Fig. 4, and when the feed-bar moves forward the pawl will strike against one of the tacks and feed the strip forward the proper distance.

In the lower end of the block is a spring-detent, *k*, Figs. 4 and 13, which will yield to the advance of the strip X, but will resist its retraction, thus preventing possibility of the strip moving back with the feed-bar.

In the lower end of the core is seated also the punch-guide F, Figs. 2 and 11. This device is for the purpose of guiding and supporting the lower end of the punch. It is perforated for the passage of the punch, is provided with a recess, *l*, for the passage of the lower end of the rack-bar, and has formed in its lower flat face a groove, *m*, which, in conjunction with a groove in the lower end of the core, forms the runway or feed-passage for the tack-strip.

In a suitable recess in the lower or block end of the core is seated the squared upper end of the nozzle G. This squared upper end is recessed to contain the rotary cogged die H, the outer face of which is about flush with the top of the squared end of the nozzle, which end, as seen in Fig. 2, fits against the under face of the guide F.

The cogged or pinion-like die H (see Figs. 8, 9, 10) has a cylindrical hub, which fits in a corresponding socket in the nozzle, and there is held by a wedge or key, *n*, which enters a lateral recess in the hub of such size as to permit the die to oscillate upon its axis to the requisite extent. The die and nozzle have of course an axial hole for the passage of the punch, which hole registers with that in the punch-guide F.

The oscillation or partial rotation in opposite directions of the die is effected by the toothed end or rack *d* of the rack-bar D, which engages cogs *o* upon the periphery of the die.

The die on its upper face is a partially-cogged disk, as seen in Figs. 6, 7, and 8, which is partly cut away from its periphery to its center, and is provided with a horn or curved projection, *p*, which will open or close the passage *r* to the central hole of the die, according to the position occupied by said die, which passage *r* is formed in the nozzle and in the die and its hub. This passage is of sufficient depth to permit the shanks of the front tack of the strip to pass laterally into the die, with the loop end of the strip in the groove *m* of the guide F.

In Fig. 6 (which is the position occupied by the parts when the punch is up) the passage *r* is open. In Fig. 7 (which is the position assumed by the die when rotated by the movement of the rack-bar due to the descent of the punch) the passage is closed by the horn *p*, as illustrated also in Fig. 14. When the horn is in the last-mentioned position, it has entered between the two foremost tacks, *y y'*, Figs. 4 and 14, just back of the foremost one *y*, so that it is straddled by the loop y^2, which joins said tacks. In this position the foremost tack, *y*, is in the axial hole of the die, with the loop y^2 resting on the horn *p*. Consequently, when the punch descends, the horn co-operates with it as a cutting-edge, by which the tack is severed from the strip, and is then, by the continued descent of the punch, driven down through and out from the nozzle. Should the front portion, y^3, Figs. 4 and 14, of the head of the tack be of such length as to extend over upon the side *z* of the die, such portion as thus extends over will be cut off. A passage is provided (at the left-hand side of the tool in Fig. 1) for the escape of such severed bits. When the punch is up, as in Fig. 3, the rack-bar is in the position shown in Fig. 4, and the die in the position shown in Fig. 6. The tack-strip X is then pushed in through the side of the tool until the front tack has passed through the open passage *r* into the die, occupying the position shown at *y*, Figs. 4 and 14. When the punch is depressed before it (the punch) reaches the die, the rack-bar will have been moved to partially rotate the die, so as to bring it to the position shown in Figs. 7 and 14, with the horn *p* between the tacks *y y'*, said horn at its extremity being at this time supported by the wedge or key *n*, upon which it rests. At the same time the rack-bar pushes back the feed-bar, there being sufficient lost motion, however, between the rack-bar and the shoulder *m* of the feed-bar, as indicated in Fig. 4, to permit the point of the horn to enter between the tacks *y y'* before the feed-bar begins to recede. By this time the cam-pin on the rack-bar has reached the vertical portion of the cam-groove *f*, so that the continued descent of the punch has no effect upon the feed or the die. The punch in said continued descent first co-operates with the die to sever the foremost tack from the strip, and then drives this tack down through and out from the nozzle. When pressure is removed from the punch, it rises at once, and in so doing returns the die to the position shown in Fig. 6 and permits the feed-bar to carry forward the tack-strip the distance necessary to introduce the next tack of the strip into the now open passage *r*.

Having described my invention and the best way now known to me of carrying the same into practical effect, what I claim, and desire to secure by Letters Patent, is as follows:

1. The combination, with the reciprocatory punch, of the axially-perforated die provided with a lateral passage to said perforation, and a horn or projection, and mechanism, substantially as described, whereby said die is actuated from the punch to partially rotate alternately

in opposite directions at the times and in the manner substantially as hereinbefore set forth.

2. The combination of the reciprocatory punch, the rack-bar connected with and operated by said punch, and the cogged die meshing with and operated by said rack-bar, substantially as and for the purposes hereinbefore set forth.

3. The combination of the reciprocatory punch, the rack-bar operated by said punch, the cogged die, and the spring-controlled feed-bar, these parts being combined and arranged together for joint operation substantially in the manner and for the purposes hereinbefore set forth.

4. The combination, with the reciprocatory punch and the rack-bar operated by said punch, of the nozzle, the cogged die, the spring-controlled feed-bar, and the punch-guide F, as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 4th day of September, 1886.

FRANK CHASE.

Witnesses:
EWELL A. DICK,
MARVIN A. CUSTIS.