2 Sheets--Sheet 1.

F. Davison—Impts. in Nail Machines.

No. 120,501. Patented Oct. 31, 1871.

FIG. 1.

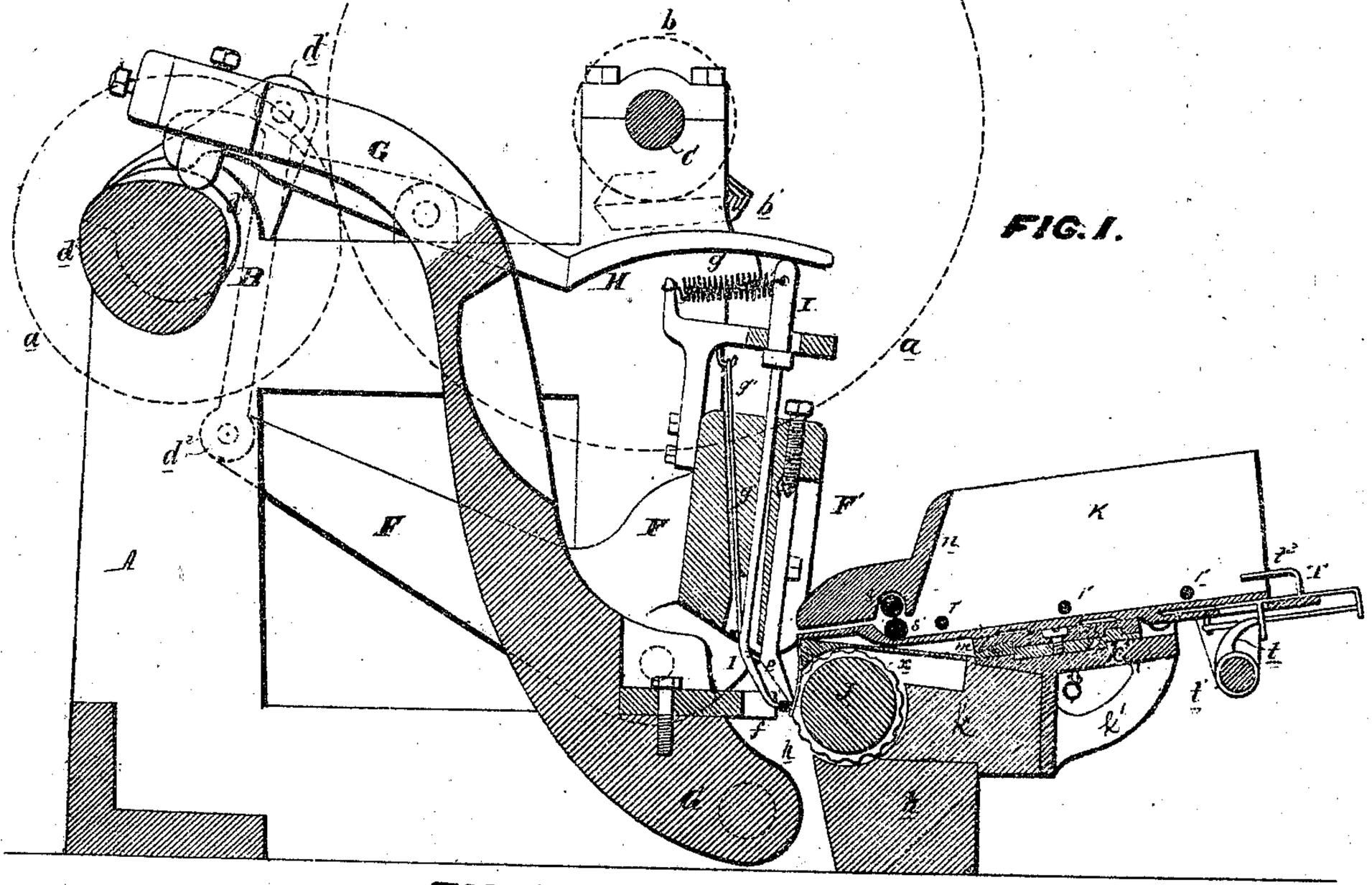
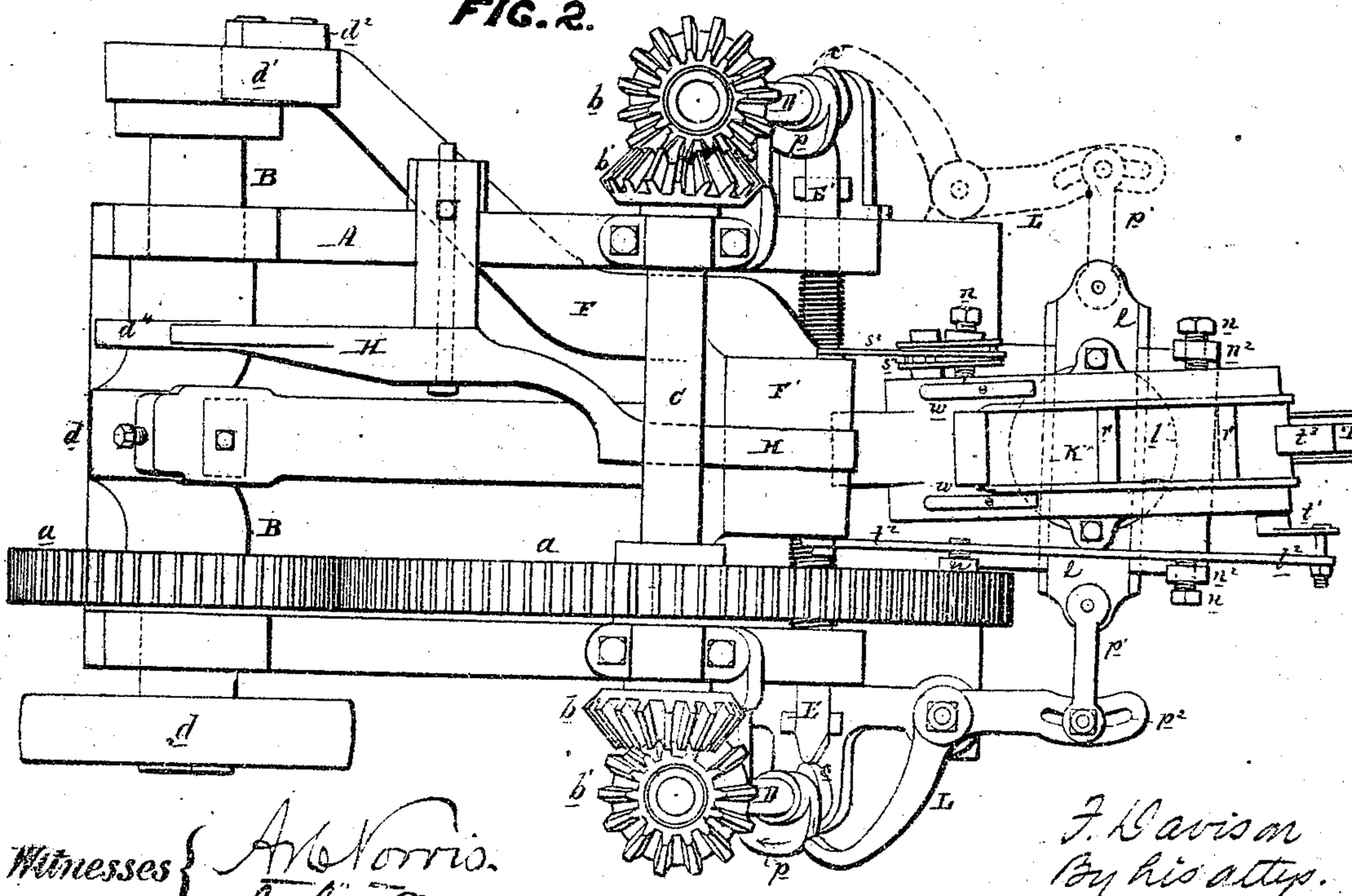


FIG. 2.



Witnesses { A. W. Norris. John Dasker }

F. Davison
By his attys.
Howson & Son

F. Davison—Impts. in Nail Machines.

2 Sheets--Sheet 2.

No. 120,501. Patented Oct. 31, 1871.

FIG. 3.

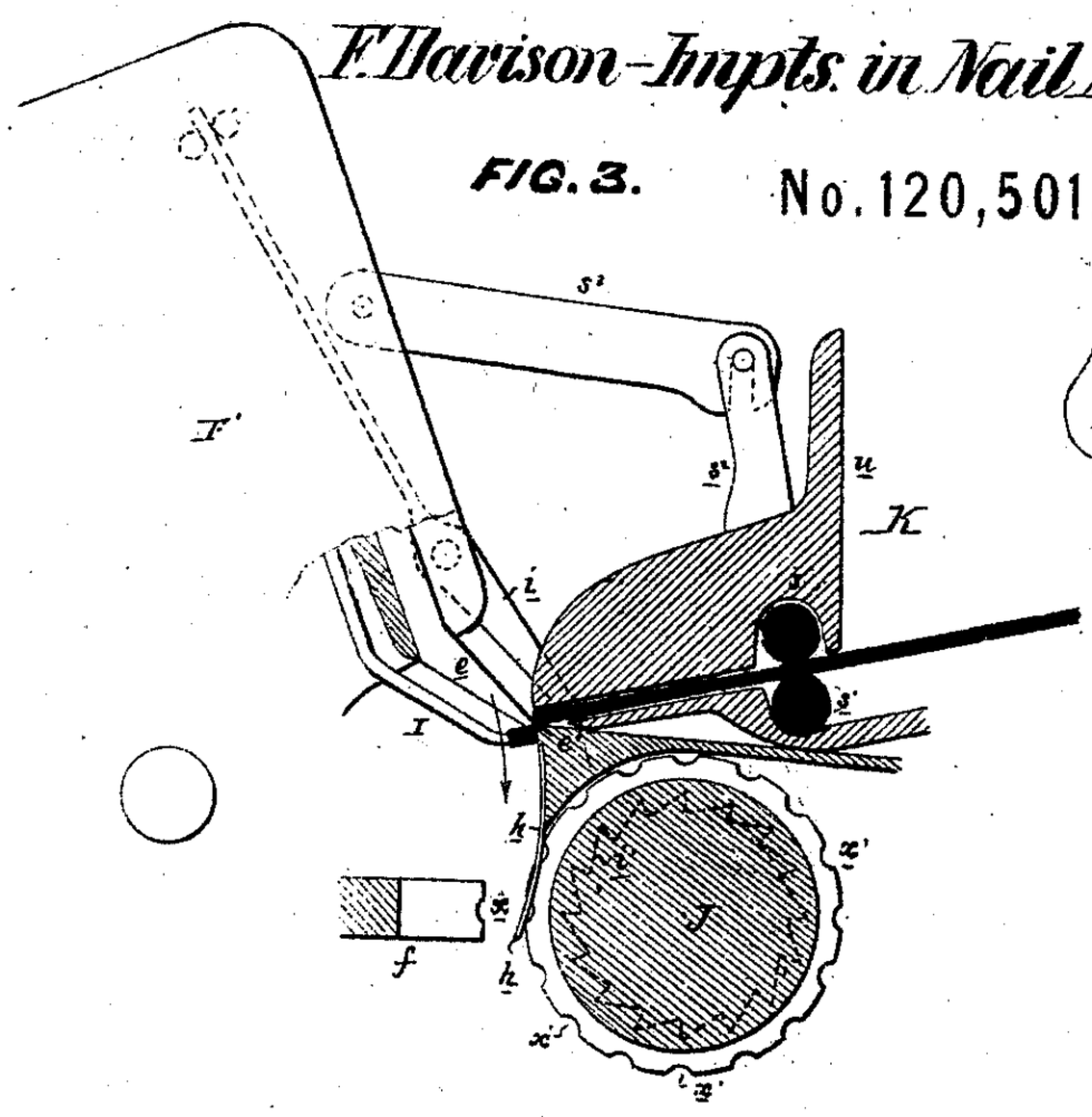


FIG. 7.

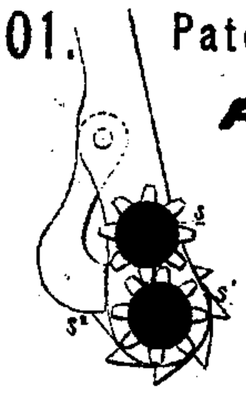


FIG 4.

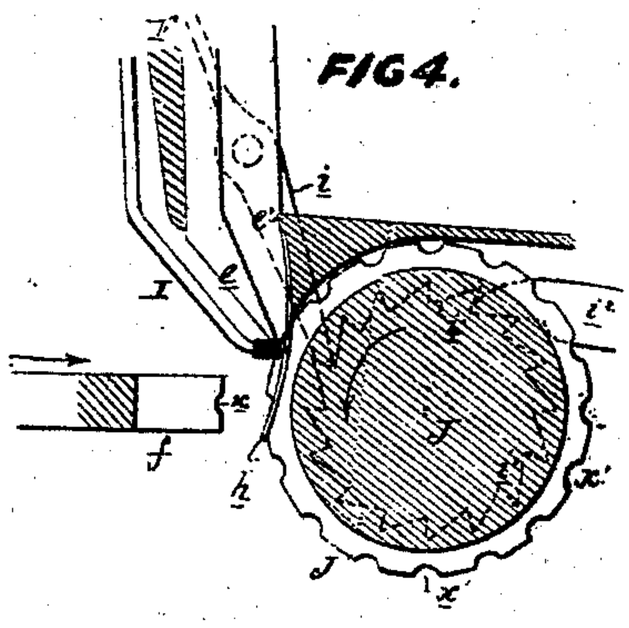


FIG. 5.

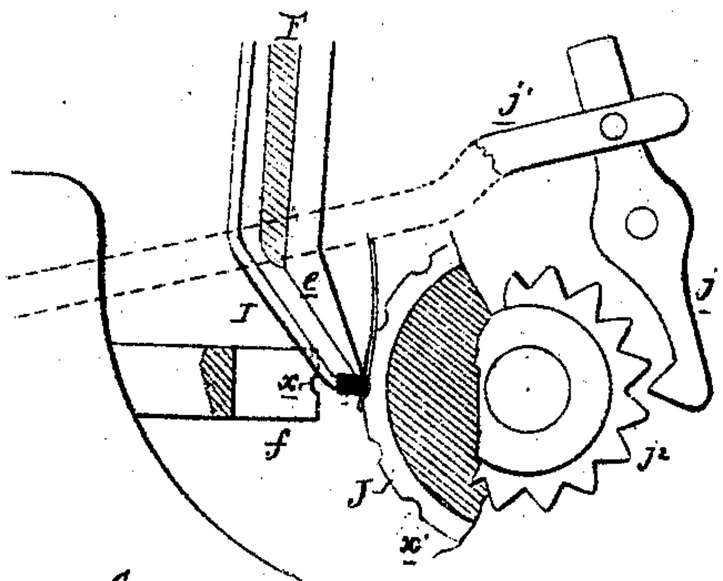


FIG. 6.

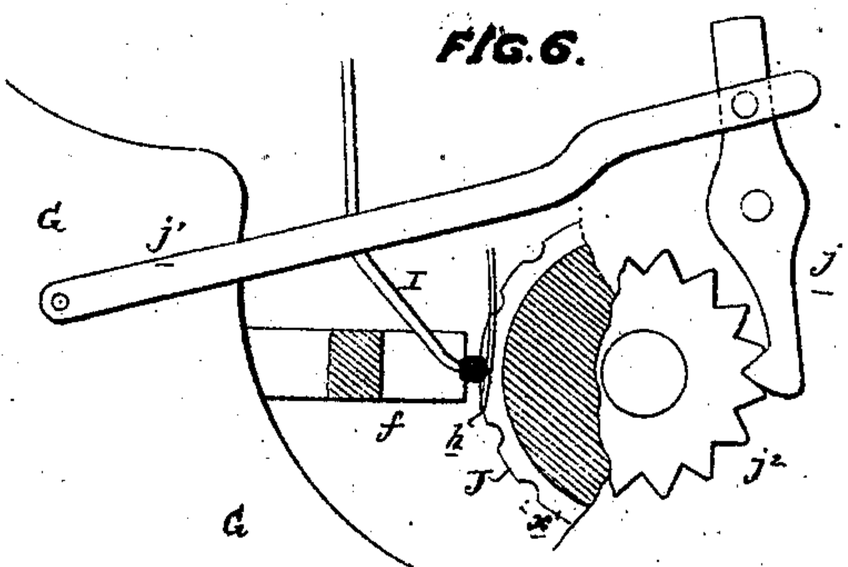


FIG. 8.

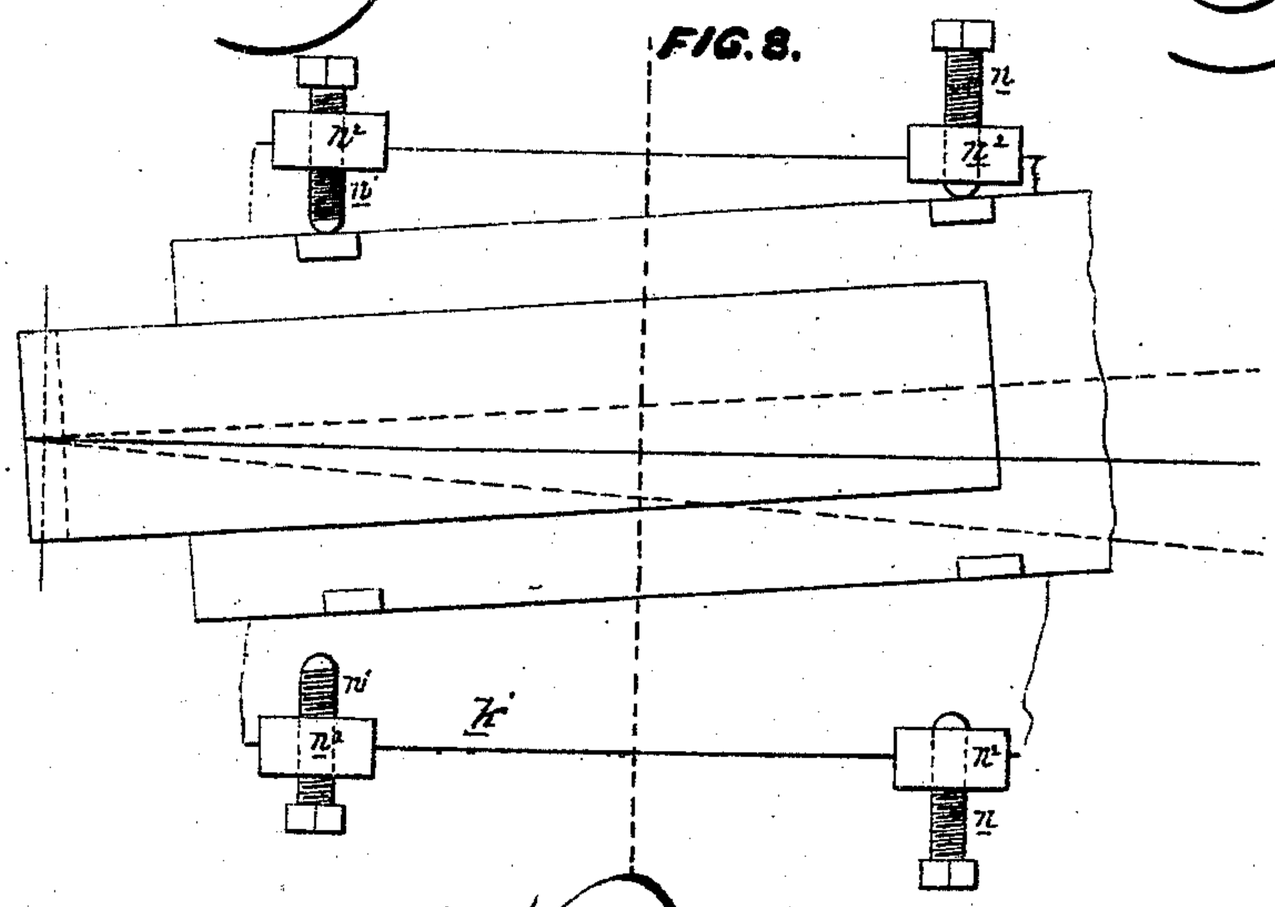
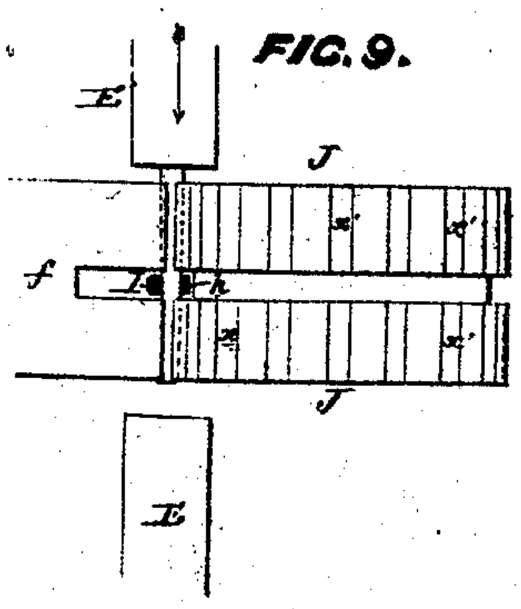


FIG. 9.



WITNESSES{ A. H. Norris. John Parker

F. Davison
By his attys
Howson & Son.

120,501

UNITED STATES PATENT OFFICE.

FERDINAND DAVISON, OF LIBERTY, VIRGINIA.

IMPROVEMENT IN CUT-NAIL MACHINES.

Specification forming part of Letters Patent No. 120,501, dated October 31, 1871.

To all whom it may concern:

Be it known that I, FERDINAND DAVISON, of Liberty, county of Bedford, State of Virginia, have invented certain Improvements in Nail-Machines, of which the following is a specification:

My invention consists of certain improvements in nail-machines, which are too fully described hereinafter to need preliminary explanation.

Figure 1, Sheet 1, is a sectional elevation of my improved nail-machine; Fig. 2, a plan view of the same; and Figs. 3, 4, 5, 6, 7, 8, and 9, Sheet 2, detached views illustrating different portions of the machine.

In suitable bearings on the opposite side frames A and A′ of the machine turn the driving or cam-shaft B and a shaft, C, the latter deriving its motion from the driving-shaft, through the medium of cog-wheels *a a′*, and having at its opposite ends two bevel-wheels, *b b*, which gear into other bevel-wheels, *b′ b′*, at the upper ends of two inclined shafts, D D′. These latter shafts have their bearings at the opposite sides of the stationary frame, and are provided, at or near their lower ends, with cams *c*, for alternately operating the heading-dies E and E′, in a manner which will be readily understood by those familiar with machines of this class. (See Figs. 2 and 9.) The shaft B has at one end a driving-pulley, *d*, and at its opposite end a crank, d^1, the latter, by means of a connecting-rod, d^2, operating a lever, F, which is hung to the opposite side frames of the machine, and which carries and imparts the desired movements to the cutter *e*, the latter descending close to the edge of the fixed cutter *e′* in order to sever the nail-blanks from the plates, as will be hereafter described. On the driving-shaft, between the side-frames, are two cams, d^3 and d^4, the former of which operates a lever, G, hung to the lower part of the frame and carrying the forked griping-die *f*, while the latter operates a light lever, H, hung to the upper portion of the side frame A, and intended to act on the upper end of the spring nipper I, which is also acted on by springs *g* and *g′*, and is adapted to and arranged to slide in an opening formed for its reception in the enlargement or head F′ of the lever F. (See Figs. 1 and 2.) The griping-die *f* is forked, or is recessed at the center, for the reception of the lower bent end of the spring-nipper I; and the revolving griping-die J, which has its bearings in a fixed part of the machine, at a point directly opposite to the griper *f*, is also recessed or divided in the center, as will be best observed in Figs. 3 and 9, for the reception of the lower portion of a curved spring, *h*, which is secured at its upper end to the fixed frame. This curved spring, as will be hereafter described, acts, in conjunction with the spring-nipper and cutter *e*, to conduct the blanks between the gripers, and afterwards ejects the finished nail from the revolving griper. Upon the end of the griper *f* there is a single transverse notch or groove, *x*, and upon the periphery of the revolving griper, at equal distances apart, there are a number of similar transverse grooves or notches, *x′*. (See Figs. 3 and 4.) The revolving griper is turned in such a manner as to bring its notches successively opposite that of the griper *f*, by a spring-pawl, *i*, attached to the lever F and engaging with the teeth of a ratchet-wheel, i^1, hung to the spindle of the said revolving griper, and indicated by dotted lines in Figs. 3 and 4. Any reverse movement of the revolving griper is prevented by a pawl, i^2, hung to the fixed frame and engaging with the teeth of the ratchet-wheel i^1. (See Fig. 4.) For the purpose of firmly locking the revolving griper and preventing any movement of the same while the nail-blank is being held and acted on by the headers, the device shown in Figs. 5 and 6 is employed. This consists of a pawl or lever, *j*, hung to the fixed frame, and connected by a rod, j^1, to the lever G, so that, on the forward movement of the latter and its die *f*, the pointed end of the said lever *j* will be caused to enter one of the similarly-shaped notches of a wheel, j^2, hung to one end of the spindle of the revolving griper, all movement of the latter being thus prevented.

The arrangement and operation of the feed-box K and parts connected therewith form important features of my invention, and are as follows: To the block or cross-piece *k* of the fixed frame is secured a plate or casting, *k′*, which supports the feed-box, and is inclined at the same angle at which it is desired to arrange the latter. Upon this plate *k′* are formed ways or guides for the reception of a transverse sliding plate, *l*, which is enlarged at the center so as to form a circular plate or disk, *l′*, upon which rests, and to which is pivoted, a disk, *m*, secured to the under side of the feed-box. (See Figs. 1 and 2.) It will thus be seen that the feed-box can both be turned up.

on its pivot and moved laterally with the sliding plate, it being regulated in these movements by set-screws n n and n^1 n^1, which pass through lugs n^2 formed on the plate k' and cross-piece k of the fixed frame. (See Fig. 8.) The above movements are imparted to the feed-box by means of curved or bent levers L L, (Fig. 2,) hung to the fixed frame, operated by cams p on the inclined shafts D D′, and connected to the opposite ends of the transverse sliding bar l by links p'. These levers are operated alternately, so as to draw the sliding bar first in one direction and then in the other. One of the levers might, however, in some cases, be dispensed with and a spring, q, Fig. 1, be substituted for the same, for the purpose of causing the bar to slide in one direction until the remaining lever moved it in the opposite direction.

The movements of the feed-box will be readily understood on referring to the diagram, Fig. 8, where it will be seen that the lateral movement is imparted to the feed-box by the sliding bar, and that, when thus moved laterally, the said box is caused to turn upon its pivot by striking the set-screws n and n^1, which adjust it to the angle at which it is desired to present the plates to the cutters, in order to cut the blanks of a tapering shape, and thus provide sufficient metal at one end of each of the blanks for the formation of the head of a nail.

The diagram, Fig. 8, shows that the angle only of the nail-plate is changed at the point where it is presented to the cutters; but it will be evident that by a further adjustment of the set-screws the plate might also be caused to move latera-ly at a point close to the cutters, so as to present more of the enlarged end of each blank to the action of the headers. The extent of the lateral movement imparted to the sliding bar and feed-box is also regulated by adjusting the links p^1 in the curved slots p^2 of the operating-levers L.

Within and close to the bottom of the feed-box there are three or other suitable number of anti-friction rollers, r, and the said box is also provided with two feed-rollers, s and s^1, geared together, as shown in Fig. 7, and operated in such a manner as to feed the plates uniformly, and at proper intervals, by a pawl-and ratchet movement, s^2, driven by a connecting-rod, s^3, which is attached to one side of the lever F. The feed-box is also provided at one end with a spring sliding bar, T, operated by a cam, t, hung to a rock-spindle, t^1, which receives motion through the medium of a connecting-rod, t^2, from the lever F.

Let it be supposed that the machine has been set in motion, and that a pile of plates has been placed in the feed-box, the undermost plate resting upon the anti-friction rollers r, with its front end adjacent to or between the feed-rollers s and s^1, and the front ends of the uppermost plates of the pile resting against the inclined front u of the box. The hooked projection t^3 of the spring sliding bar or supplementary feed T will first act upon and push the undermost plate of the pile between the geared feeding-rollers s and s^1, and the latter will feed the plate forward until its front end is presented to the action of the movable and fixed cutters e and e', by which the plate will be cut into blanks of a proper tapering shape, owing to the rocking movement of the feed-box. As soon as the rear end of the first plate reaches the feeding-rollers a second plate will drop into its place, and will be pushed forward to the feed-rollers in the same manner as the first, the feed being continuous and uninterrupted as long as the box is supplied with plates. The feed-rollers may be serrated or roughened, if desired; or a slight degree of pressure may be exerted upon the uppermost roller by means of springs or other devices, as shown at w, in Fig. 2, in order to prevent the said rollers from slipping upon the plates without feeding the latter. Each blank, as it is severed from the plate, is carried downward by the cutter e and spring-nipper I from the position shown in Fig. 3 to that indicated in Fig. 4, the blank then entering one of the notches of the revolving griper, when the latter will also be caused to turn in the direction of its arrow, Fig. 4, until the blank held between the spring-nipper and curved spring h and forced downward by the cutter e has been brought to the position shown in Fig. 5, when the revoving griper will be locked by the pawl or lever j, and the cutter will be raised to its original position. The spring-nipper, however, although attached to the ascending cutter-head, will remain depressed, owing to the action upon its upper end of the lever H, until the griping-die f has been moved forward, as shown in Fig. 6, so as to impart the required degree of pressure to the blank during the action of the heading-die. As soon as the blank is thus held the spring-nipper is released by the lever H and ascends to its original position, and on the rearward movement of the griper f the finished nail is ejected by the spring h from the notches of the revolving griper, and the latter is unlocked in order that it may be again turned and receive another blank.

In the machine as above described the severed blank is carried straight downward, and its cut edges are presented to the gripers, so that the product is what is commonly known as an "edge grip" nail. It will be evident, however, that the parts could be easily arranged to turn the blank so as to present its flat sides to the gripers, and thus produce a "flat grip" nail.

Although I prefer to arrange the several parts, both of the machine proper and of the feed mechanism, in the manner described, it will be evident that the feed-box can be used in connection with other nail-machines without departing from my invention—with those, for instance, in which the cutters and gripers have a direct sliding or reciprocating instead of a curvilinear movement; and it will also be evident that the machine illustrated in the drawing, with its spring-nipper and spring h, could be combined with a feeding device differing from that described.

I do not claim a feed-box or nail-plate receptacle pivoted to a reciprocating slide for imparting to it lateral movements alternately in opposite directions; nor do I claim a pair of adjusting-screws, one on each side and near the for-

ward end of said receptacle, to arrest the movement thereof in order thereby to change the obliquity of the plate to the cutters, as all this is old; but

I do claim as my improvement—

1. The relative arrangement of the pivot which connects the feed-box to the reciprocating slide, and on which said box is free to turn, and the four set-screws n n n^1 n^1 for arresting the lateral movement of said box, the former being at or near the middle of the bottom of said box, and the latter located at the two ends and on opposite sides thereof, as described.

2. The combination, as described, with the cutter-head, of the spring-nipper I, adapted to and arranged to have a sliding movement therein, springs g g', and lever H, substantially as specified.

3. The spring h arranged below the fixed cutter and between the griping-dies of the machine, so as to operate in conjunction with the movable cutter and spring-nipper in feeding the blanks to the gripers and headers, and so as, also, to serve as an ejector for the finished nail.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FERDINAND DAVISON.

Witnesses:

AUGS. WINSLOW,

JAMES W. SMITH.

(103)