D. J. FARMER.

NAIL & TACK MACH.

3 Sheets--Sheet 1.

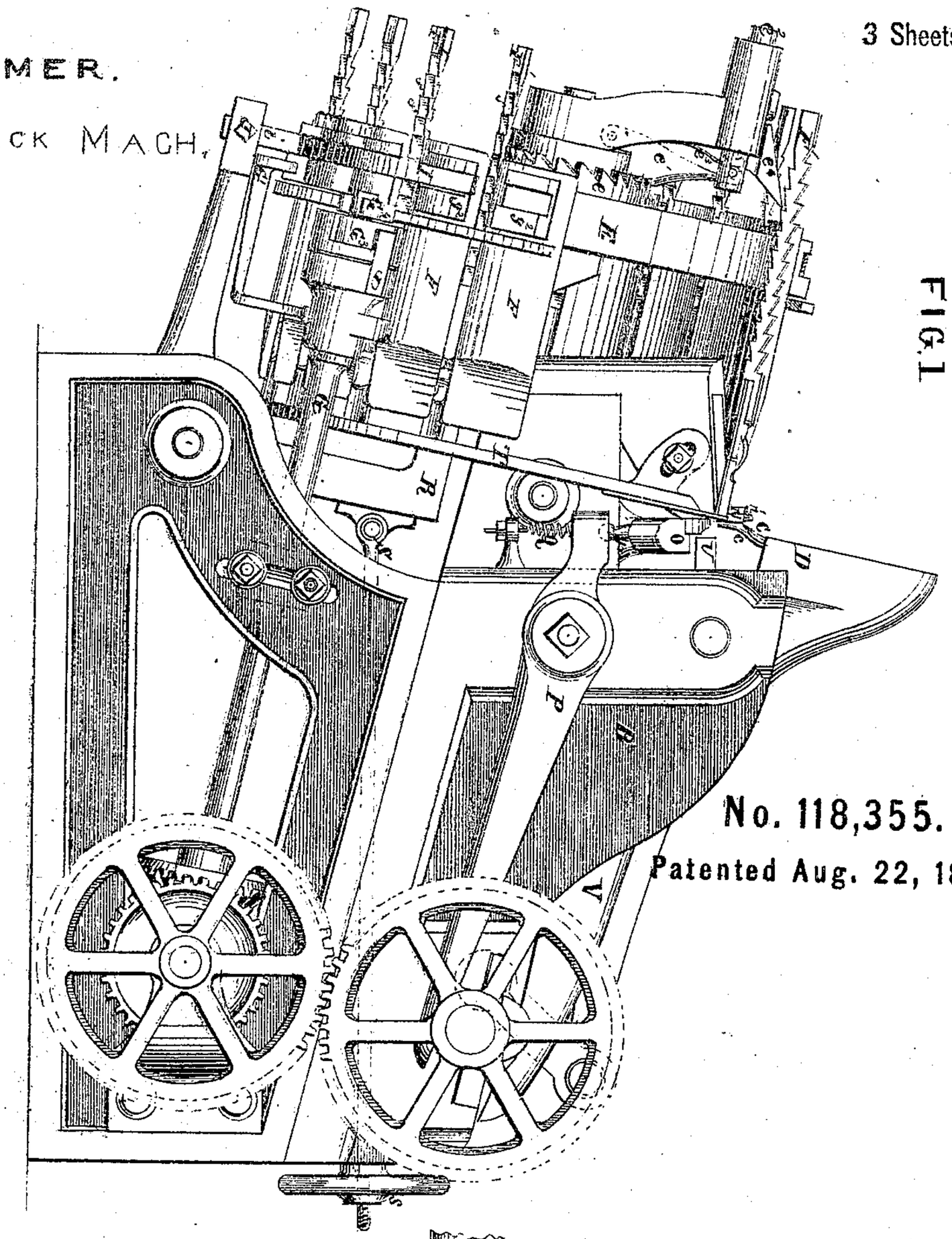

FIG. 1.

No. 118,355.

Patented Aug. 22, 1871.

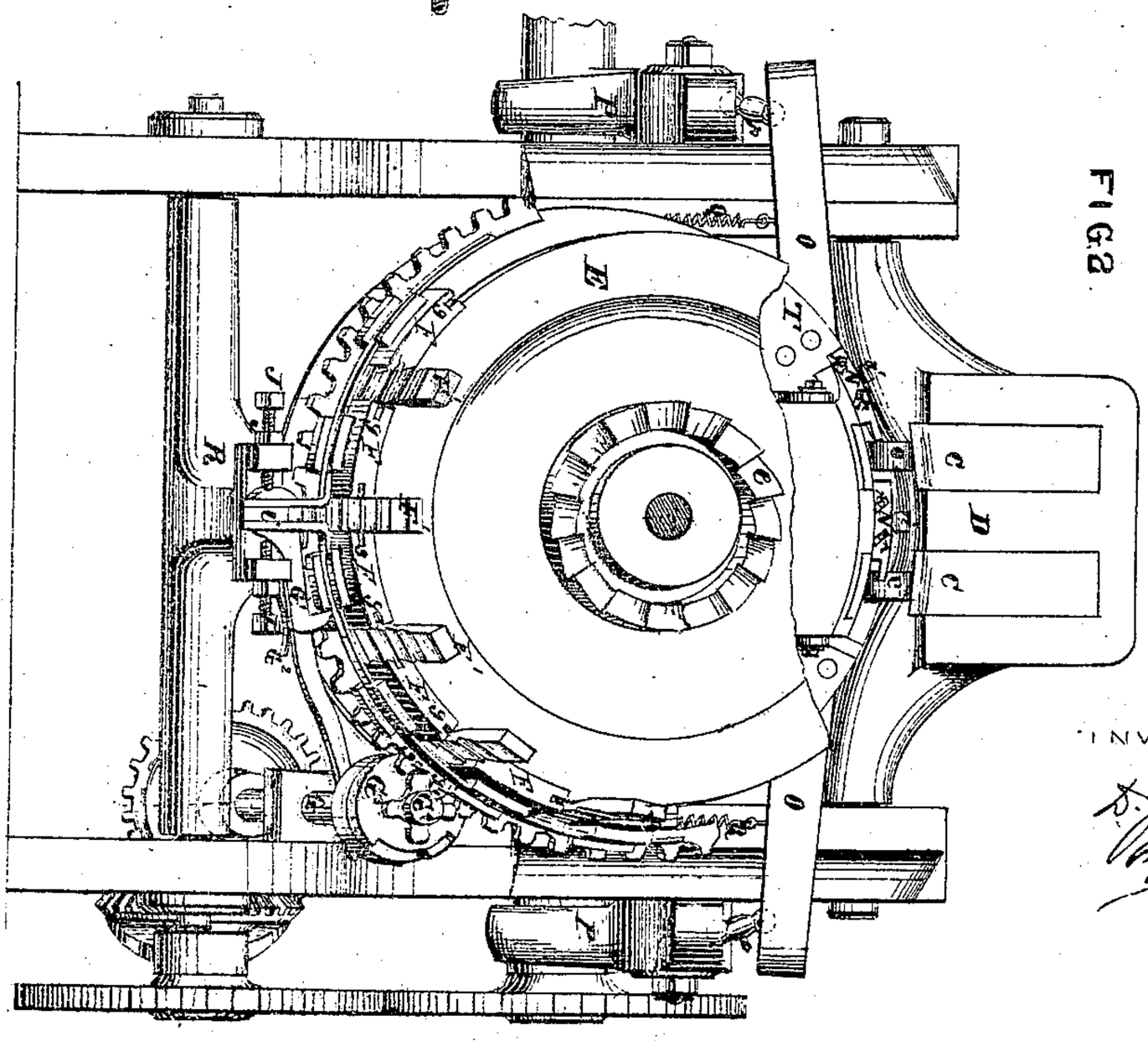

FIG. 2.

WITNESSES.

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3 Sheets--Sheet 2.

Improvement in Cut-Nail and Tack Machines.

No. 118,355.

Patented Aug. 22, 1871.

FIG.3.

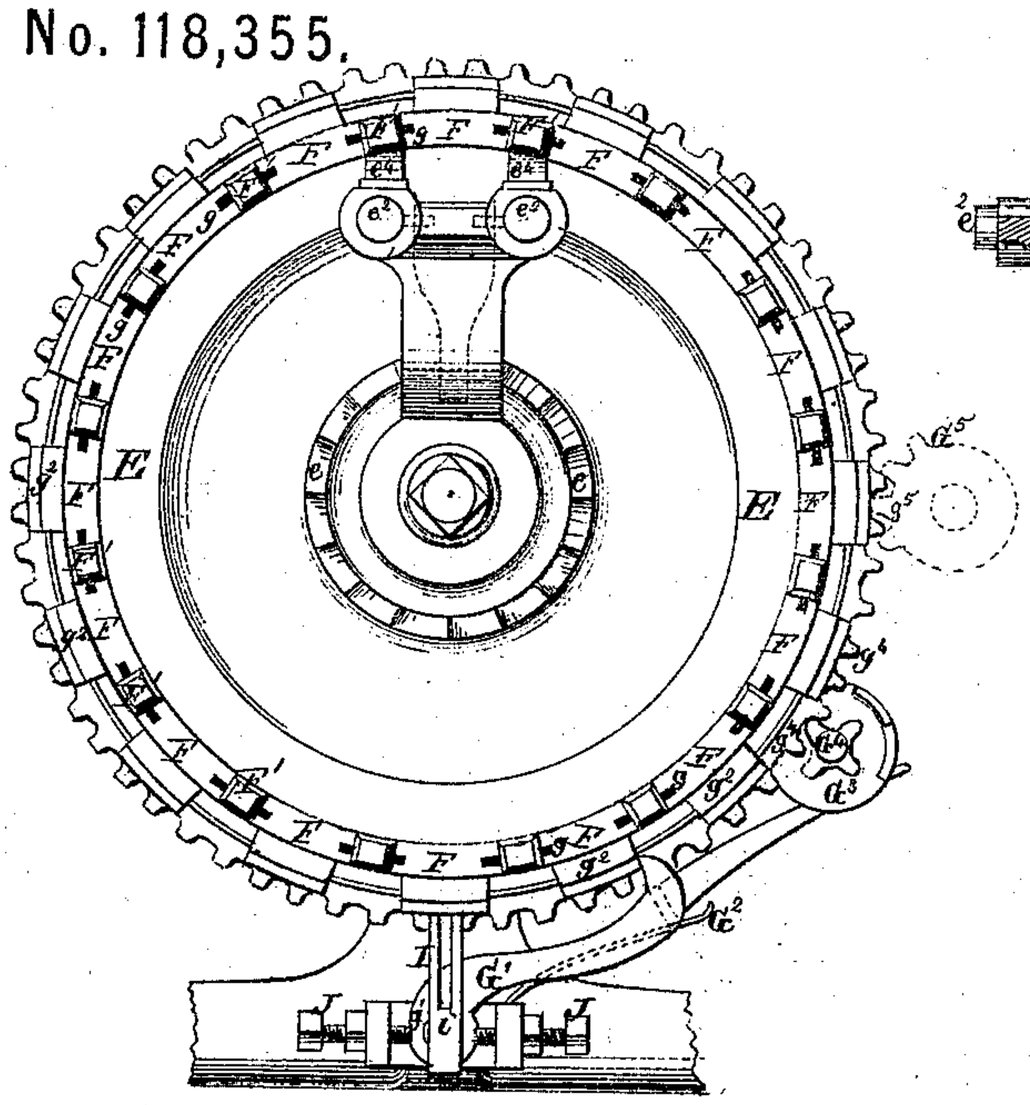

FIG.4.

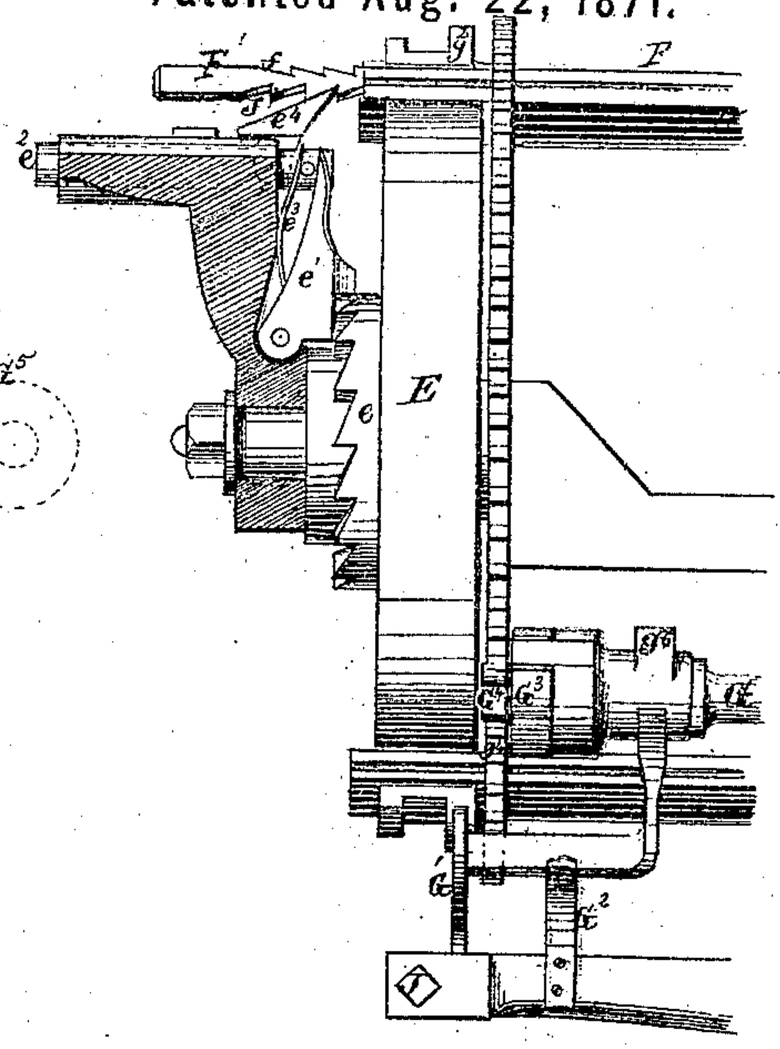

FIG.5.

FIG.6.

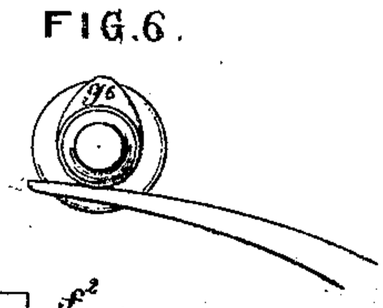

FIG.7.

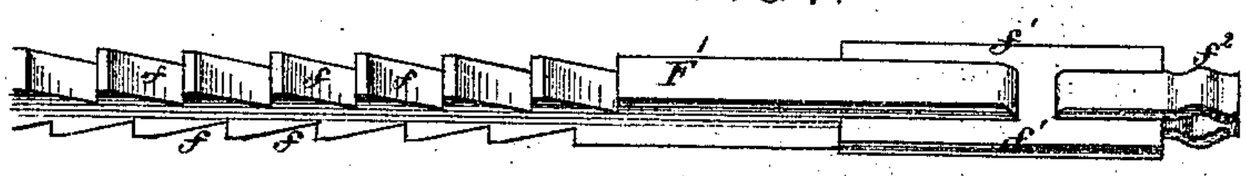

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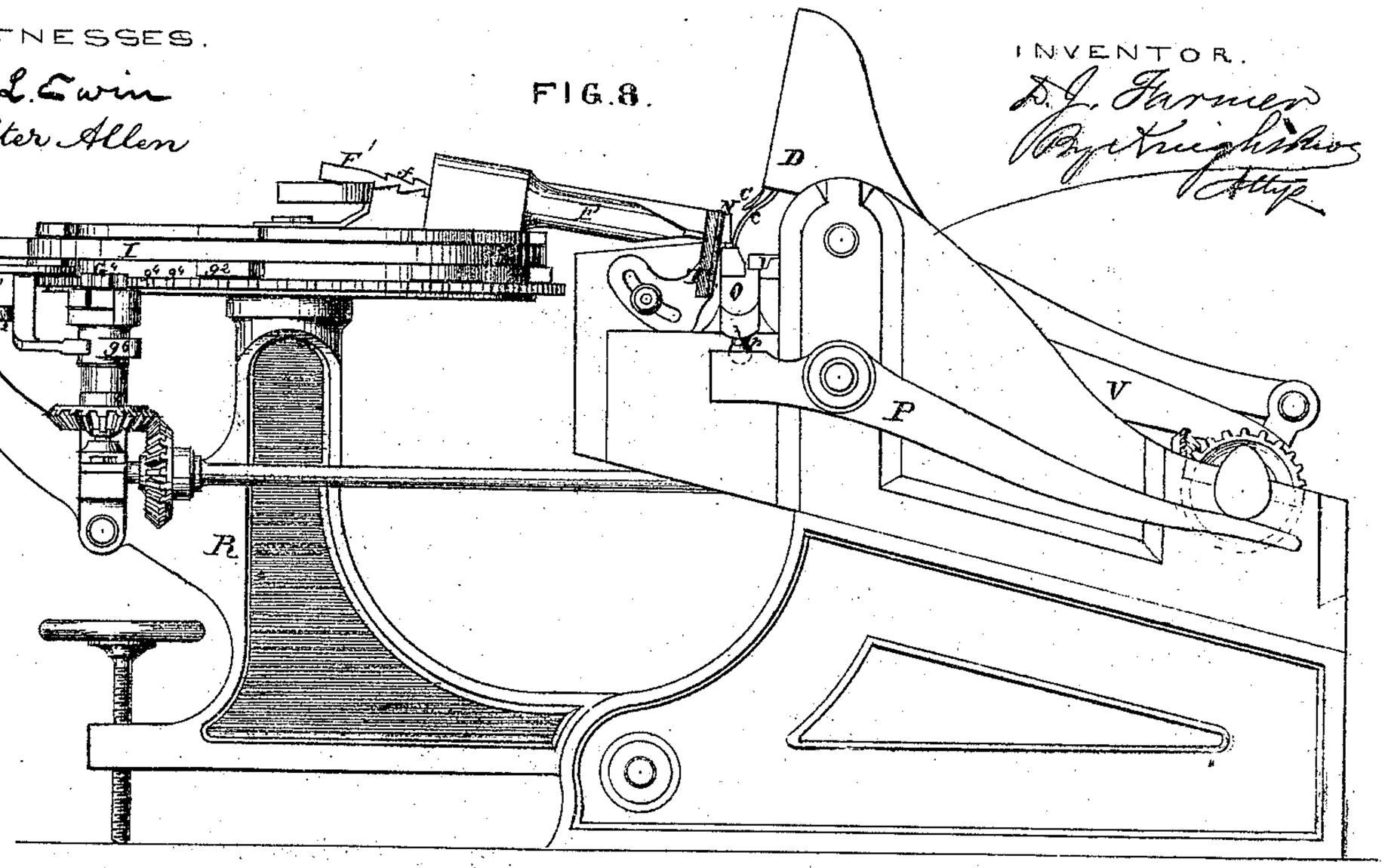
FIG.8.



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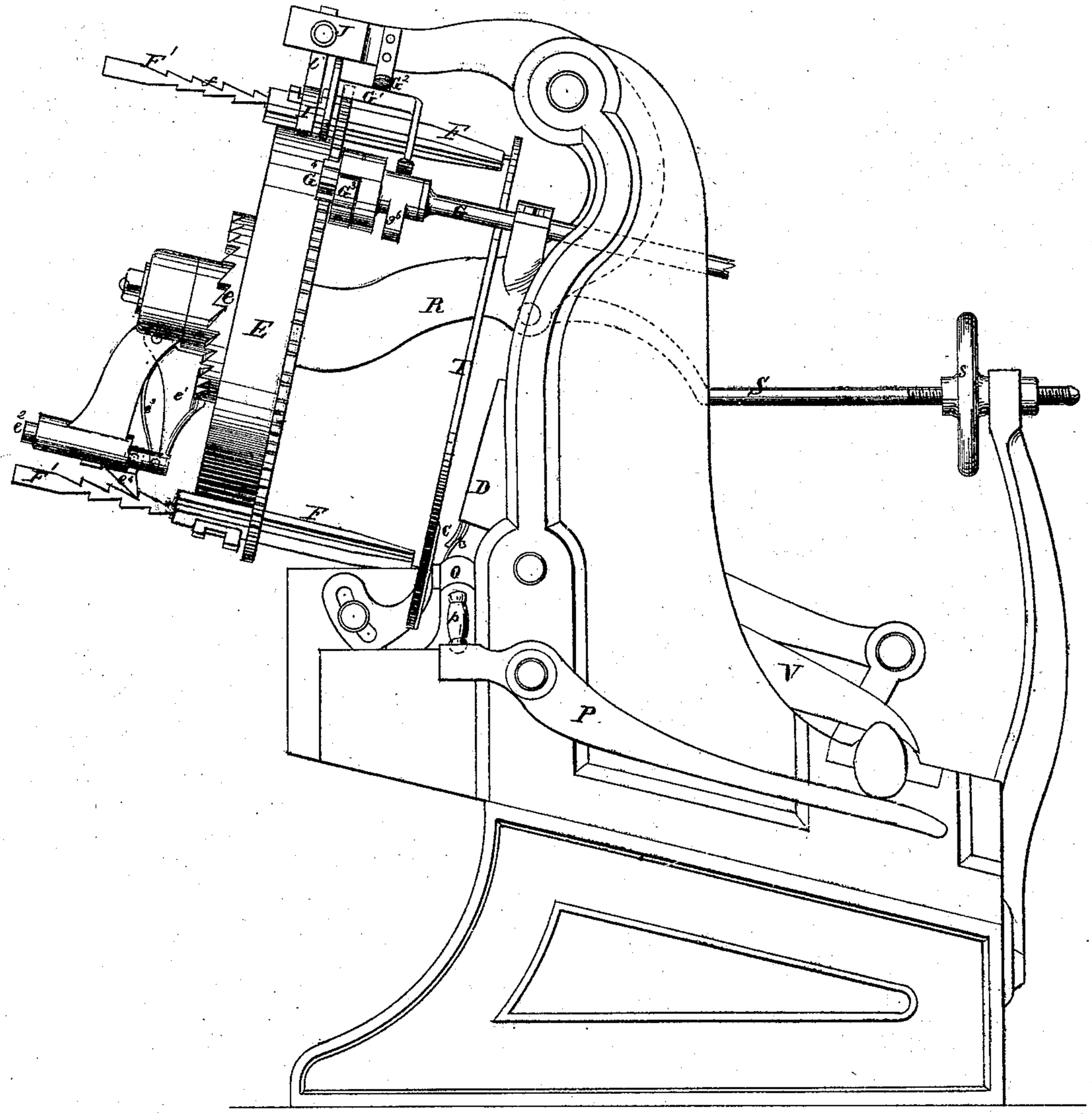
D. J. FARMER. 3 Sheets--Sheet 3.

Improvement in Cut-Nail and Tack Machines.

No. 118,355. Patented Aug. 22, 1871.

FIG. 9.



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UNITED STATES PATENT OFFICE.

DAVID J. FARMER, OF WHEELING, WEST VIRGINIA.

IMPROVEMENT IN CUT-NAIL MACHINES.

Specification forming part of Letters Patent No. 118,355, dated August 22, 1871.

To all whom it may concern:

Be it known that I, DAVID J. FARMER, of Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Nail and Tack-Machines, of which the following is a specification:

My invention relates to a machine provided with two or more pairs of cutters arranged obliquely to each other, with their accompanying griping-dies, and headers, and suitable nippers, and gauges, by means of which appliances at each stroke of the machine or movement of the cutting-head two or more nails or tacks are cut and headed from a strip equal in width to the length of the nail, and allowing enough in excess for the head to be upset. The invention further consists in the arrangement in or upon a rotating head or table of any desirable number of non-rotating feeders, for conducting the plates to the cutters.

By means of these appliances I am enabled to cut and head nails or tacks from strips of sheet metal, two or more at each stroke of the machine, without turning the feeders or strips. Referring to the details of the invention, it further consists in mounting the rotary head or table on a pivot, and providing means for adjusting it toward or from the cutters; also, in mechanism for communicating an intermittent rotation to the feeder-head or table from a continuously-moving shaft; also, in the employment of automatic griping-jaws or plates, so applied that they will release or yield to the nail-plates during the forward movement of the table, and will clamp them when the said forward movement is arrested; also, in mechanism for communicating an endwise movement to the feeders automatically from the rotary movement of the table.

Figure 1 is a side view of the machine with some of the feeders and their guiding-sockets omitted. Fig. 2 is a front view of the same with the upper part of the feed-table and the devices for actuating the feeders omitted. Fig. 3 is an elevation of the feed-table, showing the devices for rotating it and for advancing the feeders. Fig. 4 is a side elevation of the same, partly in section. Fig. 5 is a front view of a spring-box employed in connection with a stop to transmit intermittent motion from a continuously-rotating shaft. Fig. 6 is a front view of a cam movement employed to withdraw the said stop. Fig. 7 is a perspective view of one of the feeders. Fig. 8 is a side view of the machine, illustrating a modification in the position of the feed-table. Fig. 9 is a side elevation, illustrating another modification in the position of the said table.

B B may represent various parts of the bed or frame of a nail or tack-machine, which I have not attempted to represent in complete form, but only so far as may be necessary to illustrate the action of the devices to which my invention essentially relates. C C are two pairs of cutters, set in a common oscillating frame, D, and arranged obliquely to each other, so that, as they act successively on the end of the same plate, the severed blanks will be tapered in opposite directions, in a manner well known and understood. These cutters are each furnished with a gauge, *c*, projecting beyond their edges, and placed behind them in a proper position to determine the width of the nail or tack-blanks cut off at each stroke. E represents the rotary head or table, carrying the feeders F, between which the nail-plates and feed-rods F′ slide within grooves *g* in the edges of said feeders or conductors F. The said head or table is journaled in a frame, R, pivoted at *r* to the stationary frame, and adjusted in position by means of a screw-rod, S, and head or nut *s*, so as to adjust the feeders to approach or recede from the cutters and headers. The construction of the feed-rods F′ is most clearly represented in Fig. 7. They are made with teeth or notches *f* to aid in imparting the longitudinal feed movement, as hereinafter described, with guiding-plates or flanges f^1, which are fitted to slide in sockets or grooves *g* in the feeders F, and with nippers f^2 in their forward ends to hold the nail-plates. The intermittent rotary movement of the feeder-head or table E may be produced in various ways from a continuously-moving shaft, G, the intervals between the motions affording the necessary time for feeding the plate forward and severing the blanks. During this period the table is held by a detent, G^1, fulcrumed at g^1, pressed inward by a spring, G^2, engaging in succession with projections g^2, which are arranged around the periphery of the table in number corresponding with the feeders. To permit the independent movement of the shaft, it is connected, through the medium of a spring, g^3, with a sleeve, G^3, on which is mounted a pinion, G^4, gearing with cogs g^4 on the periphery of the feed-table. When the blanks are severed and the table is to move again,

a cam, g^6, on the shaft G, throws the detent G^1 out from the table E, permitting the spring g^3 to move the said table until it is again stopped by the next projection g^2 coming against the detent G^1. With the relative arrangement of parts here represented, there being four teeth, g^4, to each space between the feeders, the pinion G^4 is provided with four teeth, so that each revolution of the shaft G will move the table E the distance of the space between two successive feeders, F. The parts are thus adapted to work together; but it is manifest that a similar effect is produced by forming the pinion, as represented in dotted lines at G^5 in Fig. 3, with four teeth, g^5, occupying one-third the periphery. This segmental pinion, being fixed upon the continuously-moving shaft G, will move the table the required distance while the teeth g^5 are in gear, and will leave the table at rest long enough to afford time for the cutters to act. The spring g^3 and detent g^1 may thus be dispensed with. To impart the endwise or feed movement to the feed-rods F′, I employ the mechanism represented in Fig. 4. The table E carries a wheel, *e*, having teeth which successively press back a lever, e^1, and slide e^2. Each time the said lever and slide are released from one of these teeth a spring, e^3, forces them forward again, and this movement, through the medium of a pawl, e^4, carried by the slide e^2, and engaging in the notches *f* of the feeder, moves and holds the latter with a moderate pressure against the knife-gauge until the blank is severed. The next tooth of the wheel *e* then again forces back the slide e^2, and releases it at the proper moment for the pawl to engage and advance the next feeder, so that each feeder as it is presented receives the requisite endwise movement. The machine being arranged to cut and form two nails or tacks at each stroke, the feed-rods are arranged in pairs, so that two nail-plates can be advanced simultaneously; but every plate is presented to each cutter in succession. The actual distance to which the feeders are moved is determined by the gauges *c* and the spring e^3 permitting the parts to work together without violence, so that in practice the feed-pawls need not act once to each cut. I is a hoop, extending around the periphery of the table, and serving as a brake to prevent its too rapid rotation. For this purpose it is formed with a lug, *i*, projecting between set-screws J J, by which it is controlled. This hoop-brake is described and claimed in my patent No. 113,644, dated the 11th of April, 1871. The forward movement of the table, by friction against the hoop I, deflects the spring-lug *i*, and the resilience of the latter imparts a slight reverse movement to the table, bringing it to the position in which it rests while the nail or tack-blanks are severed, when the brake gradually resumes its normal position. N N′ represent automatic clamp-plates—one for each cutter—which gripe the respective nail-plates when the cut is to be made. Their upper or movable jaws consist of plates notched or recessed on their lower edges, and having oblique slots working on stationary studs or pins *n n*. *n′* are springs, tending to press the plates N downward and backward. These parts are so constructed and arranged that the pressure of the nail-plates in the forward movement of the table raises the clamp-plates N, and the reverse movement above referred to, which immediately precedes the cut of the knives, will cause said clamp-plates to descend upon and gripe the nail-plates, or their springs and oblique slots will hold them firmly against vertical movement in the absence of any reverse movement of the table. O O represent the headers, actuated by levers P P through the medium of rods *p p*, and retracted by springs Q. The levers P are arranged on the outside of the machine, on either side, so as to afford ready access to them for any purpose. T is the customary guard-plate or flange, against which the ends of the nail-plates rest in their revolution, a gap or recess in the said plate permitting the plates to pass to the cutters at the proper time. The guard-flange is described and claimed in my patent No. 103,730, dated the 31st day of May, 1870. U U represent the clamping-dies, which hold and press the blanks while under the action of the headers O O. The moving members of these dies are mounted in a pivoted frame or lever, V, which is actuated from the main cam-shaft.

The plates are cut of a width corresponding with the length of blanks for the required nails or tacks, and their rear ends having been inserted in the nippers f^2, the said nail or tack-plates, with the feed-rods F′ attached, are inserted between the feeders F and passed forward until stopped by the guard-flange T, or, in the case of the nail or tack-plates opposite the cutters, by the customary knife-gauges, which determine the width of blanks to be severed. The edges of the plates also rest against gauges, as described in my patent No. 103,730, hereinbefore referred to, and they are held by the clamp-plates N bearing upon them. The machine being then set in motion, the blanks are severed, and the plates from which they have been cut being carried edgewise against the shoulders of the plates N, cause the said plates to rise by reason of the obliquity of their attaching slots. As soon as the rotation of the table ceases the clamp-plates are pressed down on the next nail-plates, and blanks are cut from them in like manner. It will be observed that, the table being moved the distance of one feeder at each stroke, the plate which at one stroke is fed to the first cutter C is at the next fed to the second cutter C′, which is set obliquely to the first, as already explained. An endwise movement is imparted to each feed-rod F′ as it approaches either cutter. Two blanks are thus severed at each stroke, the said blanks being point to point. They are then caught by the dies U, and their projecting wide ends are upset by the headers O, completing a nail or tack of whatever kind the machinery may be made to produce. When the forward rotary movement is resumed the clamp-plates N N′ rise automatically, permitting the plates to pass beneath them and immediately fall again, so that the clamp-plate, which griped the nail-plate while under the action of one cutter, may form the edge-gauge, against which the nail-plate is moved backward for the next cut. The endwise movement imparted to the nail-plate at the instant when it

escapes from the guard-plate or flange and is caught by the end gauge beneath the cutters, and the reverse movement of the table, which immediately succeeds, enable me to employ a stationary edge-gauge, which will allow the nail-plates to pass edgewise from the cutters. The obliquity of the slots by which the clamp-plates N N′ are attached causes the said clamp-plates to be elevated by a forward pressure of the nail-plates, and to firmly resist an upward pressure of the nail-plates when the head or table is not revolving forward. As soon as the table stops, the springs *n′* above the clamp-plates N N′ are thus permitted to press the said clamp-plates down upon the nail-plates, and any vertical deflection of the latter is then prevented by the obliquity of their attaching slots; but as soon as the blank has been severed, and the forward rotation of the head or table is resumed, the edgewise pressure of the nail-plates against the clamp-plates easily raises the latter on their attaching pins *n* until the lower edge of the plate N or N′ is above the level of the nail-plate, permitting the latter to pass freely beneath it.

I claim as my invention—

1. The combination of the two or more sets of cutters arranged obliquely to each other, two or more sets of griping-dies, two or more headers, the intermittently-rotating head or table E, the series of feeders or conductors F non-rotating relatively to the said table, and any suitable means for advancing the nail-plates through or between said feeders or conductors, substantially as herein set forth.

2. The combination of the feed-table or head E with the pivoted frame R, and the screw and nut S *s* for adjusting the said table to or from the cutters, substantially as set forth.

3. The combination of the intermittently-rotating head or table E, the continuously-rotating shaft A′, the transmitting mechanism G^3 G^4, and stopping and releasing mechanism G^1 G^2 g^6, substantially as set forth.

4. The automatic griping device N, constructed and applied substantially as described, in combination with the cutters C and any suitable device for feeding the nail-plates to said cutters, for the purposes set forth.

5. The arrangement of the sectional feeders or conductors F, grooved at their edges on the periphery of the revolving head or table E, to which they are permanently attached, substantially as and for the purposes herein set forth.

6. The lever e^1, slide e^2, pawl e^4, and cam-wheel *e*, in combination with the notched feed-rod F′, substantially as and for the purposes set forth.

DAVID J. FARMER.

Witnesses:

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SAMUEL FARMER.