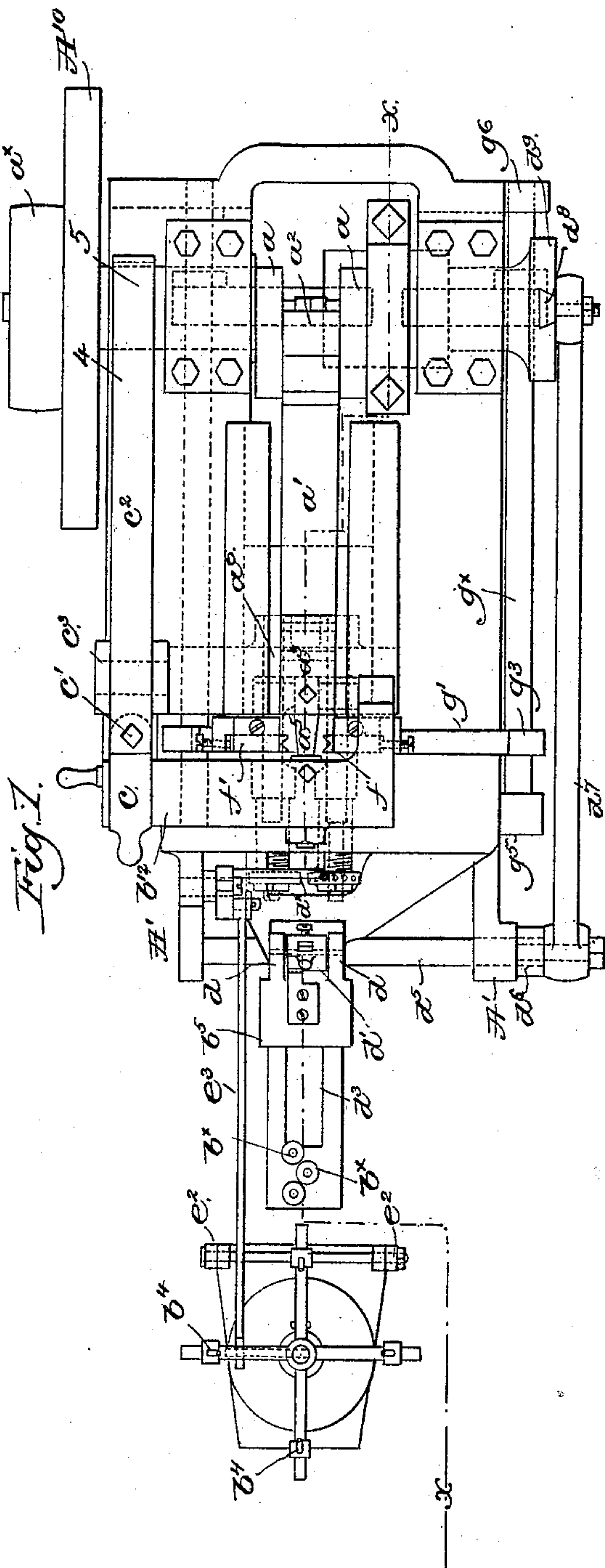
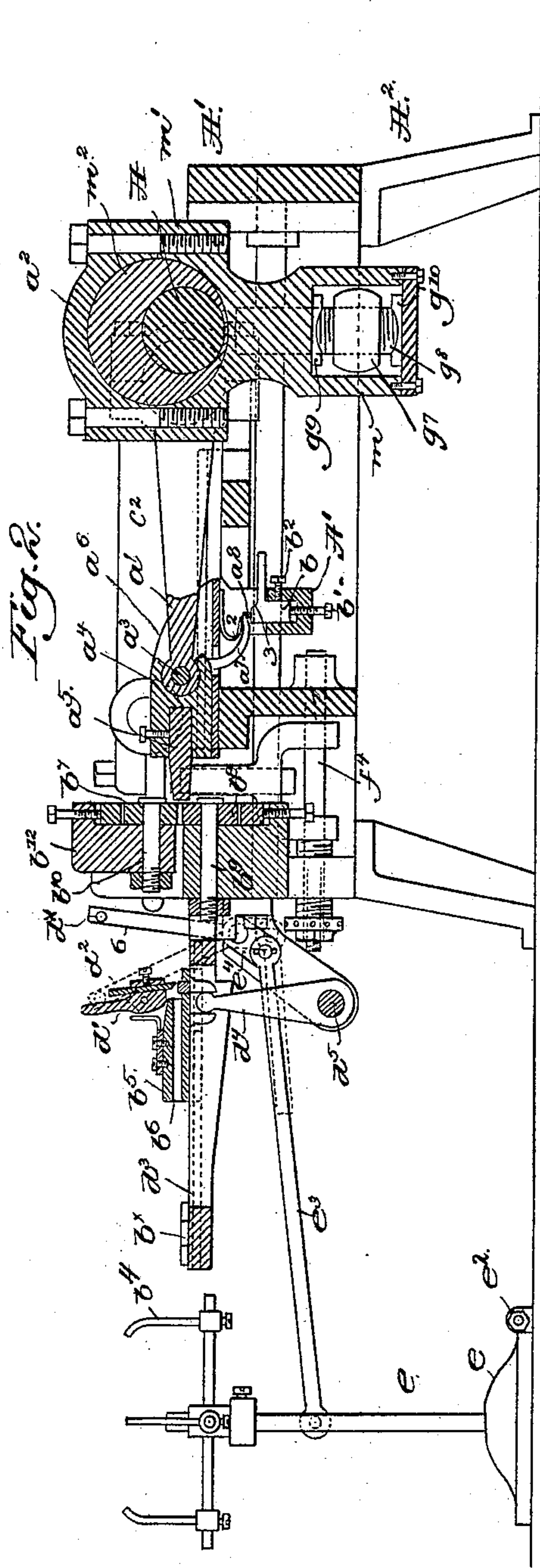


F. BRYANT.
WIRE NAIL MACHINE.

No. 397,067.

Patented Jan. 29, 1889.



Witnesses.
Fred L. Emery,
John F. C. Prankert

Inventor.
Forrester Bryant,
by Lemmy & Gregory Attys.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

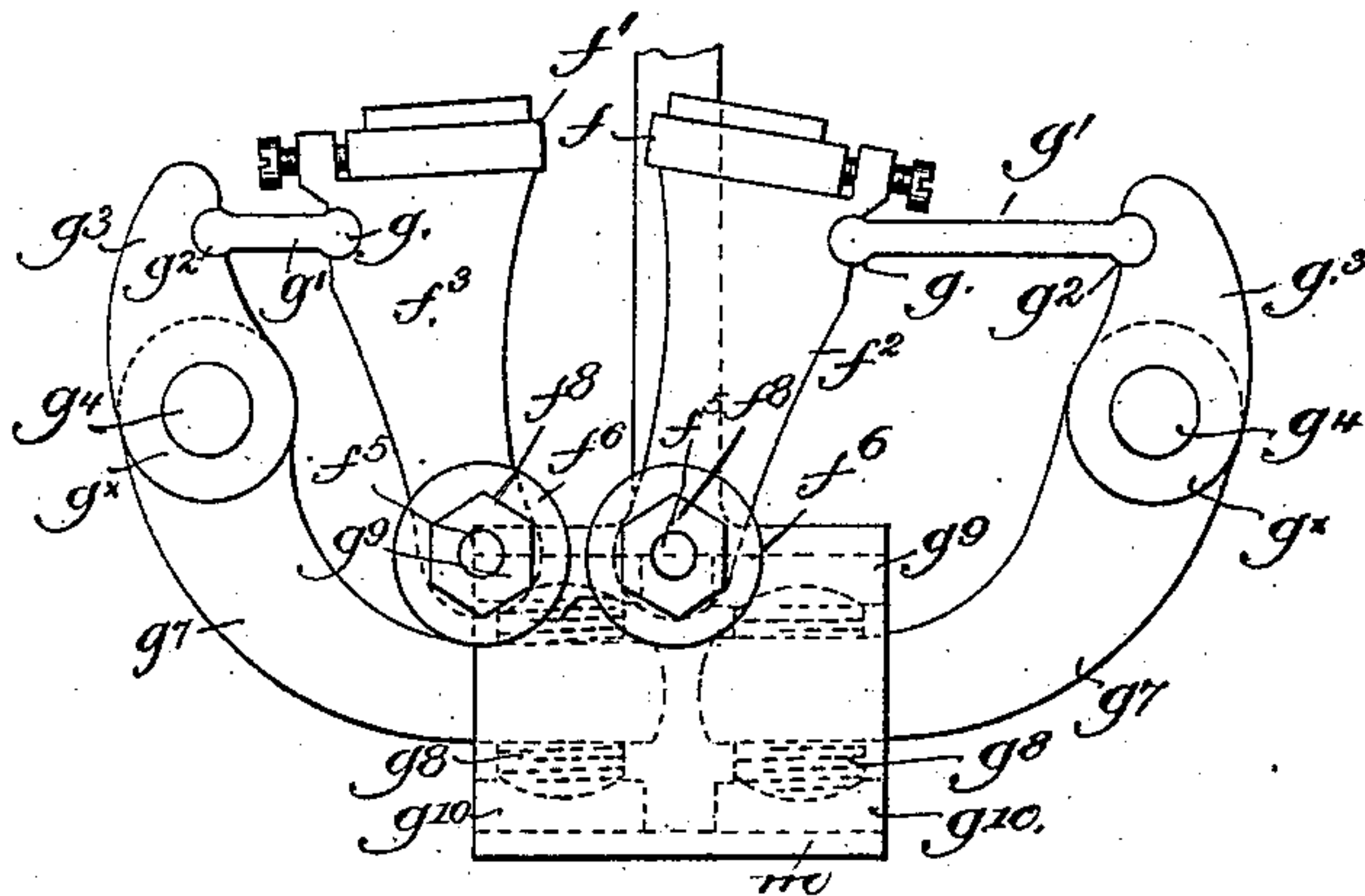
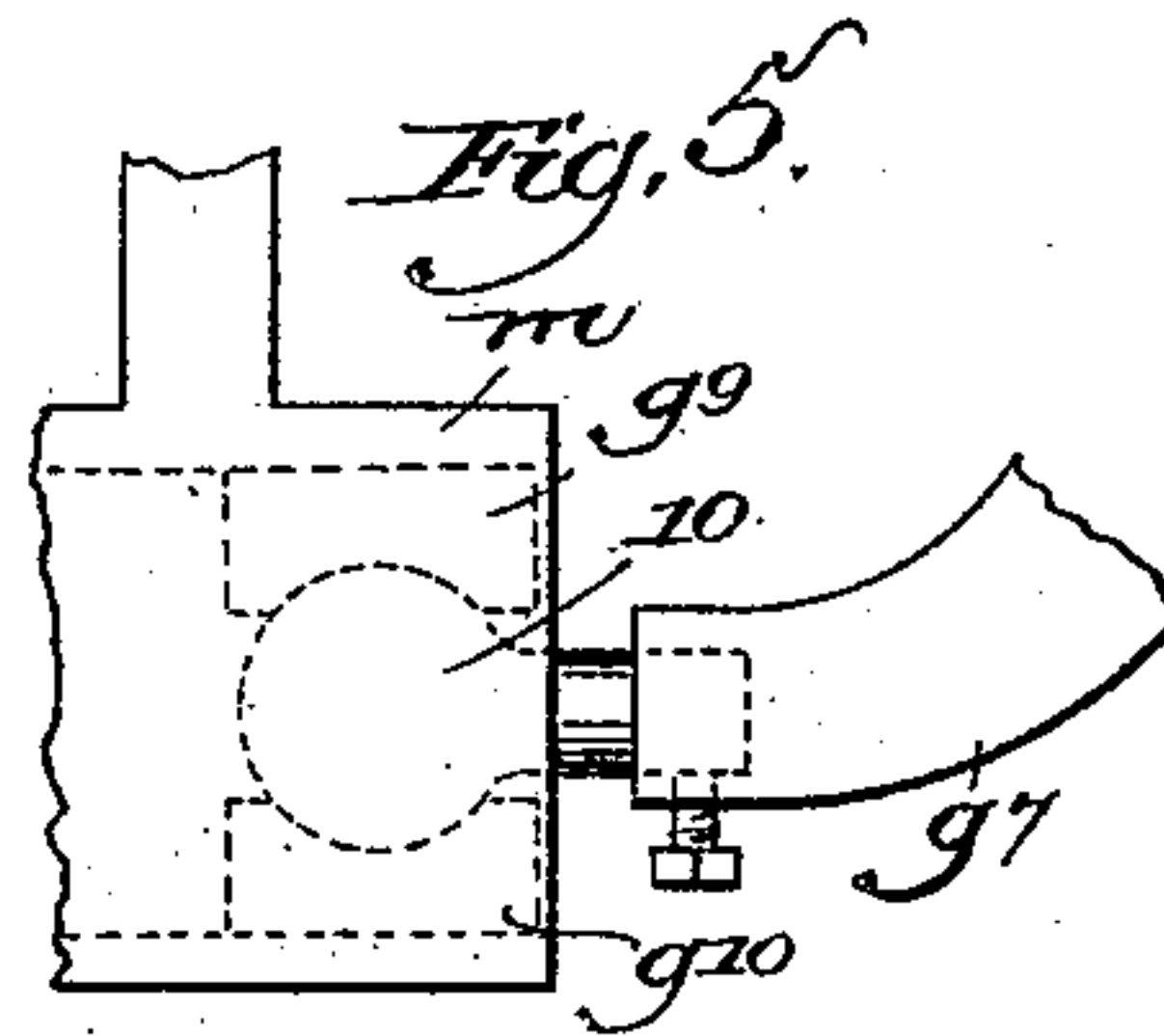
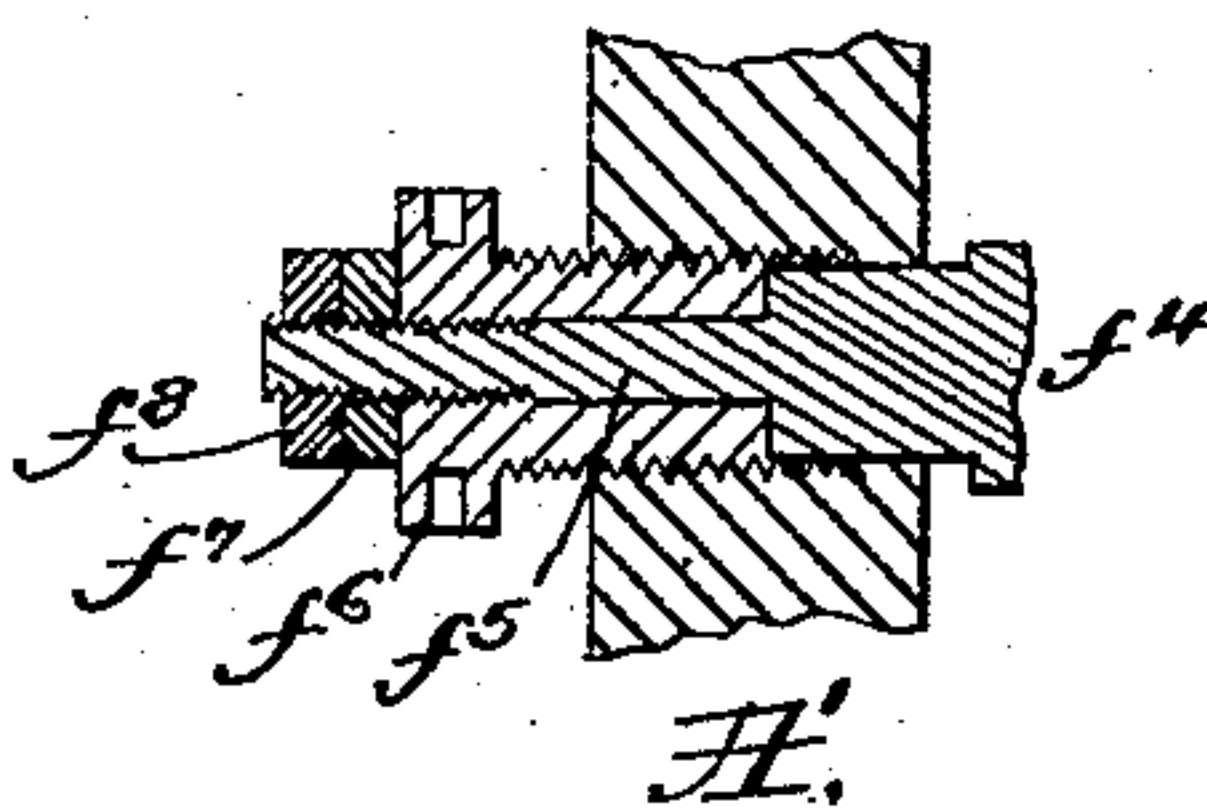


Fig. 4.



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UNITED STATES PATENT OFFICE.

FORRESTER BRYANT, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE
BRYANT NAIL COMPANY, OF PORTLAND, MAINE.

WIRE-NAIL MACHINE.

SPECIFICATION forming part of Letters Patent No. 397,067, dated January 29, 1889.

Application filed March 12, 1887. Serial No. 230,597. (No model.)

To all whom it may concern:

Be it known that I, FORRESTER BRYANT, of New Haven, county of New Haven, and State of Connecticut, have invented an Improvement in Nail-Making Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention relates to wire-nail-making machines, and is an improvement upon the machine shown and described in my application, Serial No. 188,988, filed January 18, 1886, it having for its object to improve and simplify the construction of the same.

15 In the machine shown in the application referred to, the head of the nail is formed by a punch or "header," and after being acted upon by the cutters the nail is precipitated into a receptacle by an independent finger or "knocker-off." In accordance with my present invention I dispense with the independent finger or knocker-off, and make the header perform the double office of header and knocker-off, my improved header permitting a longer nail to be cut with less throw of the crank operating the said header. In this particular my invention consists in the combination, with the mechanisms for feeding, cutting, and gripping or holding the wire, of a block arranged in a reciprocating carriage and acted upon by a cam to rock it at intervals, the said block receiving and supporting the header.

35 Another feature of my invention consists in pivoting or hinging to the floor or to a support thereon the stand supporting the reel from which the wire is taken, so that the said stand may be turned on its pivot or hinge toward the machine in case the wire becomes entangled, the said stand as it approaches the machine acting to turn a lever to operate upon the feed-dog carriage to remove the dog out of engagement with the wire, and thereby prevent the wire from being fed.

50 My invention further consists in making the jaws which hold the cutters and the mechanism operating them of such construction, as will be hereinafter described, as to relieve the same of upward pressure, the said upward pressure tending to lift the jaws bodily, and in such case if any lost motion ensued

at the pivots of the jaws the wire would be bent upward, so that when the header struck 55 the wire it would form the head of the nail on one side of the longitudinal center of the wire.

Other features of my invention will be pointed out in the claims at the end of this specification. 60

Figure 1 is a plan view of a nail-making machine constructed in accordance with my invention and of the reel to support the wire connected thereto; Fig. 2, a longitudinal section of the machine on line $x x$, the reel and its supporting-stand being in elevation, the fly-wheel being omitted. Fig. 3 is a detail showing more clearly the connection between the cutter-carriers and the mechanism operating them; Fig. 4, a detail to be referred to; and Fig. 5 is a modification. 70

The main shaft A, having bearings in the top frame, A', of the machine, supported upon standards A², is provided with a crank, a , to which is secured the connecting-rod a' , provided with the usual strap, a^2 , the said shaft having the usual belt-pulley, a^x , and fly-wheel A¹⁰. The connecting-rod a' has secured to it by a pin, a^3 , a rocker, (shown as a block,) a^4 , to which is fastened the punch or header a^5 , that forms the head of the nail, the said pitman being extended through the said rocker and having bearings in a cross-head or carriage, a^6 , the said cross-head being reciprocated in suitable guideways at each revolution of the main shaft, the said rocker being turned or rocked on the pitman a^3 , for a purpose to be hereinafter described, at each reciprocation of the cross-head. 80 90

The rocker a^4 , as shown, is provided at its under side with an arm, a^7 , (see Fig. 2,) preferably having at its end a roller, a^8 , which rides upon the upper surface of a cam-block, b , secured, as shown, by screws b' b^2 to the frame A', the said arm being herein shown pressed down upon the said cam-block by a spring, 2. The roller a^8 normally rests upon the highest part of the cam-block, as shown in Fig. 2, when the header is forming the head 100 of the nail. As the rocker a^4 and cross-head a^6 are moved backward through the connecting-rod, the roller a^8 travels down the inclined surface, as 3, of the cam-block, thus turning the rocker on its pivot and lifting the header 105 up out of line with the wire.

The wire is fed forward from a reel, b^1 , by a feed mechanism, herein shown as a carriage, b^5 , provided with a longitudinal bore or hole, b^6 , through which the wire is extended after passing through straightening-rolls b^x , common to nail-making machines, the said wire being passed between dies b^7 b^8 , the lower die, b^8 , being secured by the bolt b^9 to the frame A' , and the upper die, b^7 , by the bolt b^{10} to the pivoted arm b^{12} , the said arm being acted upon to cause the dies to firmly grip the wire while the header is acting to form the head of a nail by the arm c , pivoted at c' to a lever, c^2 , pivoted at c^3 to the frame A' , and having its long arm 4 acted upon by a cam, 5, (shown in dotted lines, Fig. 1,) on the main shaft, the said cam acting upon the lever c^2 as the header commences its forward stroke, the parts just mentioned operating substantially as in the application referred to.

The carriage b^5 is provided with uprights d , to which is pivoted a lever, d' , provided with a dog, d^2 , to engage the wire and feed it forward as the carriage is moved forward in the guideway d^3 .

The carriage is moved forward and backward by a feed mechanism consisting, as shown, of an arm, d^1 , having one end extended into a socket in the under side of the said carriage, the other end of the said arm being secured to a rock-shaft, d^5 , having bearings in the frame A' , the said rock-shaft having an upright arm, d^6 , connected to one end of a pitman, d^7 , having its other end pivotally secured to a block, d^8 , fitted into the dovetail slot in the disk d^9 , secured to or forming part of the main shaft.

The stand e , supporting the reel b^1 , is pivoted to lugs e^2 , secured to the floor, and is connected by the rod e^3 to the short arm of a lever, e^4 , pivoted to the frame A' , and having its long arm 6 extended upward and provided, as shown, with a stud, d^x , the said stud standing in the path of movement of the lever d' . If the wire should become entangled, the stand e would be drawn toward the machine, it turning upon its pivot.

As the stand e is drawn toward the machine, the rod e^3 acts upon the lever e^4 to move its long arm 6 from its full into its dotted line position, Fig. 2, and when in the latter position the stud d^x will be struck by the lever d' on the next forward movement of the feed-carriage b^5 , thus turning the lever d' on its pivot and lifting the dog d^2 out of engagement with the wire, consequently permitting the feed mechanism to reciprocate the carriage b^5 without feeding the wire. The feed mechanism is so timed with relation to the movement of the rocker a^1 and cross-head a^6 that the wire is fed forward as the said rocker and cross-head are withdrawn or are on their backward movement.

A sufficient length of wire having been fed forward to form a nail of desired length, which length can be varied by changing the position of the block d^8 in the dovetail slot in the

disk d^9 , the said wire is acted upon by cutting knives or dies f f' .

The cutting-dies f f' are secured to like cutter-carriers, f^2 f^3 , one at each side of the machine, and both being alike I shall specifically describe but one, as f^2 . The cutter-carrier f^2 at its lower end is made as a yoke secured, as herein shown, to a journal or spindle, f^4 , having its bearings in the frame A' .

The journal f^4 at one end, as herein shown, is reduced in diameter to form a stud, f^5 , upon which is mounted a sleeve, f^6 , threaded on its outer surface to engage threads in the opening in the frame A' . (See Fig. 4.)

The stud f^5 is threaded at its end to be engaged by a washer, f^7 , and nut f^8 , the said washer and nut acting to keep the sleeve f^6 abutted against the end of the journal f^4 , as clearly shown in Fig. 4. The cutter-carrier f^2 is adjusted forward and backward, as described, by means of the sleeve f^6 .

The cutter-carrier f^2 , as shown in Fig. 3, is recessed at one side near its top to receive a ball, g , on one end of a link, g' , having at its opposite end a ball, g^2 , to enter a recess or socket in the side of an arm or upright, g^3 , of a sleeve, g^x , mounted on a shaft, g^1 , the said shaft having bearings in lugs g^5 g^6 on the frame A' . (See Fig. 1.)

The sleeve g^x near the rear of the machine is provided with a depending arm, g^7 , shaped, as shown in Fig. 3, to extend toward the center of the machine, the inner end of the said depending arm being preferably provided with a threaded opening to receive a threaded pintle, g^8 , having its ends ball-shaped to enter sockets in metal slippers g^9 g^{10} ; but instead of the threaded pintle I may employ a ball, 10, attached to the arm g^7 , and forming with the metal slippers a universal joint, as shown in Fig. 5.

The metal slippers g^9 g^{10} are supported in a housing, m , forming part of an eccentric-strap, m' , embracing the eccentric m^2 on the main shaft A , as shown in Fig. 2, the vertical movement of the eccentric-strap m' and housing m imparting a rocking movement to the sleeve g^x and arm g^3 and permitting the said slippers to slide in the said housing. The rocking motion of the arm g^3 is transferred to the cutter-carrier f^2 through the link g' to rock the said cutter-carrier on its journal f^4 to produce a movement of the cutting-dies toward and from the wire held by the dies b^7 b^8 . The cutter-carrier f^3 is operatively connected in a similar manner to that described for the cutter-carrier f^2 . As shown in Fig. 3, the link g' , connecting the cutter-carrier f^2 with the arm g^3 , is longer than the link connecting the cutter-carrier f^3 with the arm g^3 on the opposite side of the machine, as the housing m is on one side of the longitudinal center of the machine.

Instead of the ball-and-socket connection shown for joining the carrier f^2 f^3 and arms a^3 , the rod g' may be pivoted thereto.

It will be noticed that the pressure exerted

to move the cutter-carriers is a side pressure, and is received by the carriers above their pivots.

In the operation of my improved machine the wire fed forward by the feed mechanism is gripped and firmly held by the dies b^7 b^8 , while the header upsets the end of the wire to form the head of a nail. The rocker a^4 and cross-head a^6 are then withdrawn by the connecting-rod a^7 . As the cross-head a^6 is withdrawn, the roller a^8 travels down the incline 3 of the cam-block b , the spring 2 keeping the said roller in engagement therewith. As the roller travels down the inclined surface of the cam-block, the rocker a^4 is turned or rocked on the pitman a^3 to lift the header out of line with the wire. The cutting-dies are then brought together to sever the nail from the wire, the said cutting-dies serving to point the nail. The rocker a^4 begins to be moved forward with the header in its elevated position at the same moment the cutting-dies are severing the nail from the wire, the said header and rocker passing over the nail until the roller a^8 arrives at the foot of the incline 3 of the cam-block b .

On the further forward movement of the cross-head a^6 the roller a^8 begins to ascend the incline 3, thereby turning the rocker to bring the header into its normal or horizontal position, the cutting-dies at such time having severed the nail from the wire, the said header serving to knock the said nail into a suitable receptacle (not shown) located below the machine in case the nail be not entirely severed from the wire. After knocking the nail from the wire, the header is moved forward in a straight line to form the head of the next nail.

By means of my improved rocking header I am enabled to cut a longer nail with a less throw of the crank than if the said header were reciprocated in line with the wire, and also to dispense with an independent finger or knocker-off.

I do not desire to limit myself to a cam-block located below the rocker, as the said block may be above, and, if desired, it may act directly upon the said rocker.

I claim—

1. In a wire-nail-making machine, a wire-feeding mechanism, a cutting mechanism to sever the wire, and a gripping mechanism to hold the wire while being acted upon, combined with a rocker arranged in a carriage and provided with a normally-depressed depending arm, a header carried by said rocker and mechanism to reciprocate the said carriage, and a cam co-operating with the said depending arm to rock the said rocker, substantially as described.

2. In a wire-nail-making machine, a wire-feed mechanism and a cutting mechanism to sever the nail from the wire, a cross-head, a rocker adapted to rock thereon, a normally-depressed projection from said rocker, and

a header attached to the said rocker, and means to reciprocate the cross-head, combined with a cam co-operating with the rocker projection to move the rocker out of line with the wire as the cross-head is moved in one direction and to bring the rocker again into line with the wire when the cross-head is moved in the opposite direction, substantially as and for the purpose specified.

3. In a wire-nail-making machine, a wire-feed mechanism and a cutting mechanism to sever the nail from the wire, a cross-head, a rocker adapted to rock thereon, a header, and an arm attached to said rocker, combined with a cam to act upon the said arm to rock the said rocker, and with a spring to keep the said arm in contact with the said cam, substantially as described.

4. In a wire-nail-making machine, a wire-feed mechanism comprising a pivoted lever and a dog to engage the wire, a reel to sustain the wire, and a pivoted stand to support the said reel, combined with a second lever pivoted to the machine and having one arm connected to the said pivoted stand and having its other arm projected in the path of movement of the lever of the feed mechanism, whereby the said second lever acts upon the lever of the feed mechanism to disengage the dog from the wire when the said stand is turned on its pivot, substantially as described.

5. In a wire-nail-making machine, a cutting mechanism comprising cutter-carriers and cutting-dies carried thereby, the sleeves g^x , having the arms g^3 , and means, substantially as described, to connect the said arms and cutter-carriers, and the arms g^7 , provided each with a threaded opening to embrace a threaded pintle, combined with slippers to engage the ends of the threaded pintles, and with a housing for said slippers, substantially as described.

6. In a wire-nail-making machine, a cutting mechanism comprising cutter-carriers and cutting-dies carried thereby, the sleeves g^x , having the arms g^3 , connected to the cutter-carriers, and the arms g^7 , provided each with a ball at its end, combined with slippers to co-operate with the said balls to form a universal joint, and with housings therefor, substantially as described.

7. In a nail-making machine, the cutter-carriers, cutters carried thereby, and means to operate said carriers, combined with the journal f^1 , the threaded stud f^3 , and sleeve f^6 , and nut to secure said sleeve on the said stud, substantially as described.

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

FORRESTER BRYANT.

Witnesses:

G. W. GREGORY,
J. H. CHURCHILL.