

M. J. Rice.

Nail Cutting Mach.

N^o 87,067.

Patented Feb. 16, 1869.

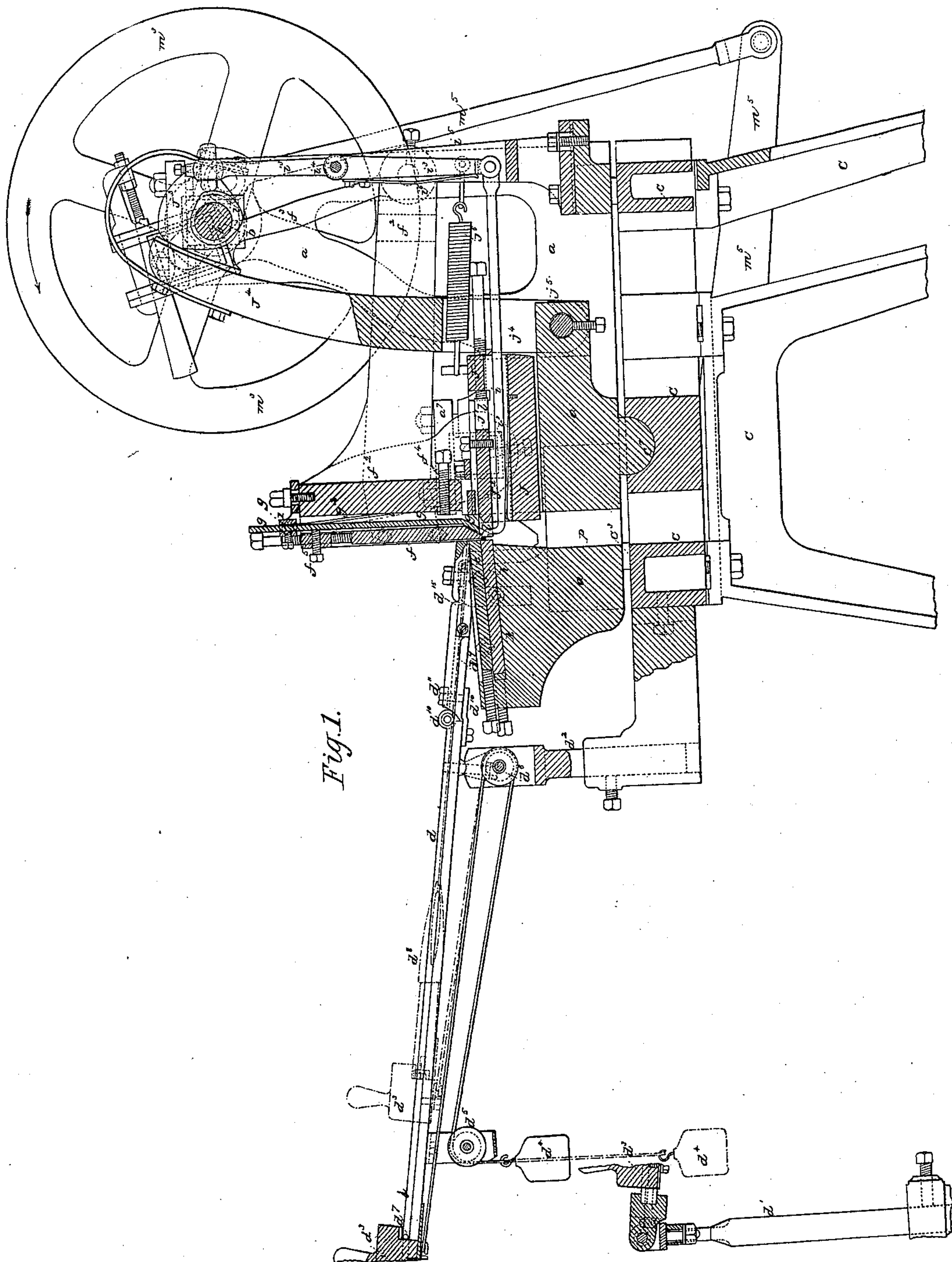


Fig. 1.

Witnesses
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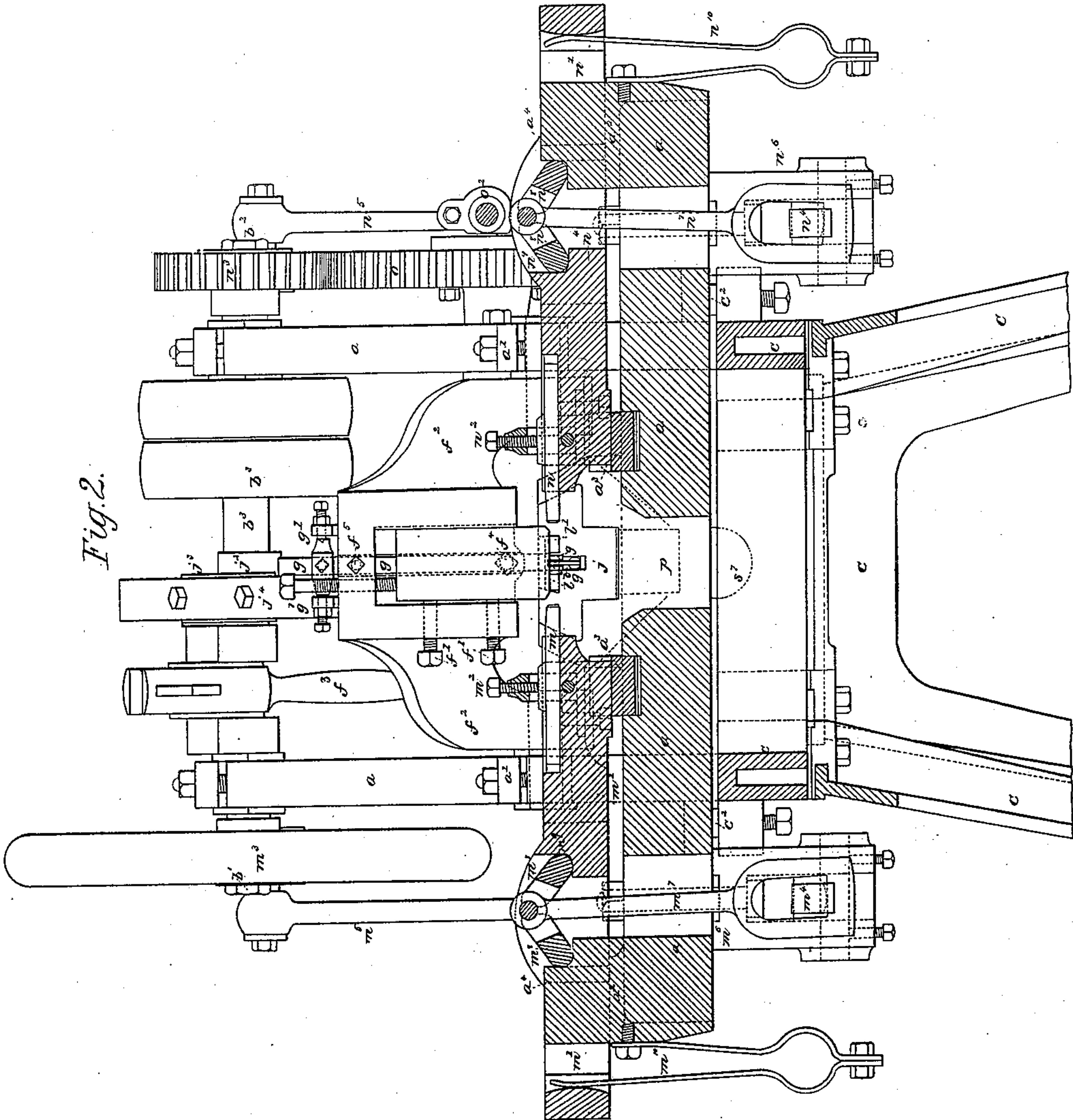
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Fig. 2.



Witnesses:
W. A. M. Stanley,
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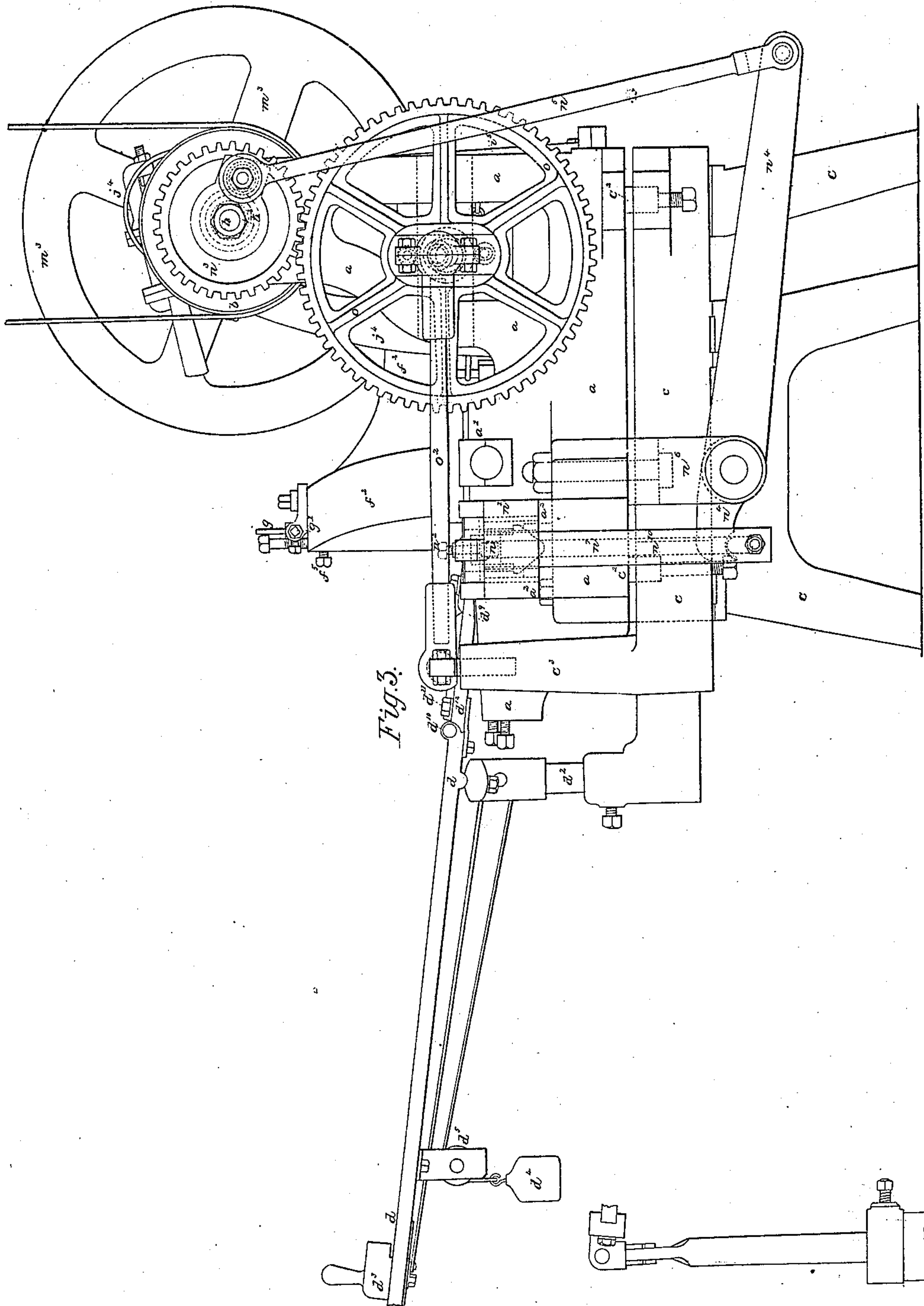
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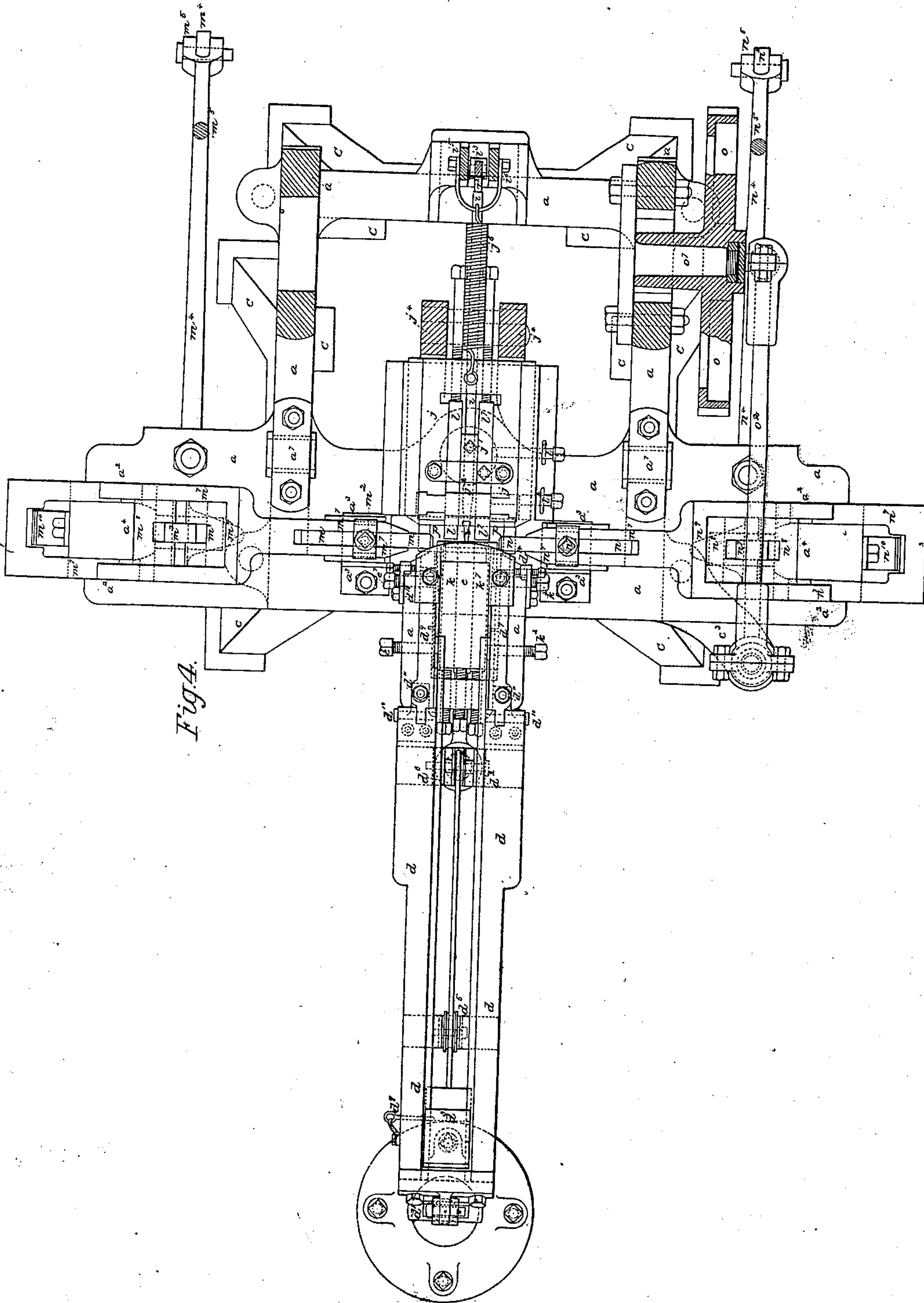


Fig. 4.

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United States Patent Office.

MATTHEW JAMES RICE, OF BIRMINGHAM, ENGLAND, ASSIGNOR
TO DENNIS M. FITCH, OF NEW YORK.

Letters Patent No. 87,067, dated February 16, 1869.

IMPROVEMENT IN NAIL-CUTTING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, MATTHEW JAMES RICE, of Birmingham, county of Warwick, England, in the Kingdom of Great Britain, have invented certain new and useful Improvements in Machinery for Cutting and Heading Nails; and I do hereby declare the following to be a full and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a vertical longitudinal section of my machine.

Figure 2, a vertical transverse section.

Figure 3, a side view

Figure 4, a plan, partly in section, with the cutter-frame removed.

My invention consists in an improved nail-plate feeder, and in certain arrangements of mechanism for moving the grippers and heading-dies in the same horizontal plane.

In the drawings—

a is the frame of the nail-cutting machine, which supports the whole of the working-parts and the driving-axis *b*, to which motion is communicated by means of the driving-pulley *b*³, and the frame *a*, together with the whole of the apparatus attached to it, oscillates upon a bearing or centre, *c*¹, formed in the stationary frame *c*, which supports the machinery.

*c*² *c*² are adjustable blocks in the frame *c*, upon which the frame *a* oscillates.

d is the stationary feed-table, attached to the stationary supports *d*¹ *d*², which are capable of adjustment in a vertical direction, so as to regulate the angle at which the plate of metal to be cut (hereinafter called the nail-plate) is fed into the machine.

The oscillation of the frame *a* and parts attached causes the cutters to assume different angles to the feed-table, so that they will cut the nail-plate, first at one angle, and then at the other, leaving a sufficient portion of the thicker end of each blank projecting beyond the grippers for the heading-tool to act upon, first on one side of the machine, and then on the other.

e is the stationary cutting-tool, secured, by means of the set-screws *e*¹, to the frame *a*.

f is the moving cutting-tool, secured, by means of the set-screws *f*¹, in the vibrating frame *f*², to which motion is communicated by a crank upon the axis *b*, by means of the connecting-rod *f*³.

The axes of the vibrating frame *f*² are supported by the bearings *a*¹ upon the frame *a*.

g is a gauge, of the ordinary form, working in a recess at the back of the cutting-tool *f*, and the gauge *g* is suspended at *g*¹ from the frame *f*¹, so as to be capable of movement.

Before the cutting-tool *f* descends to cut off a blank, the end of the nail-plate is pressed against the part of the gauge *g* which is below the cutting-tool *f*, so as to

overcome the resistance of the spring *g*², and bring the gauge *g* in contact with the set-screw *f*⁴, in the vibrating frame *f*²; and by turning the set-screw *f*⁴, the amount of metal cut off for each nail is regulated.

After the blank is cut off, it is carried down the face of the fixed cutting-tool *e* by the cutting-tool *f*, the spring *g*² acting to cause the gauge *g* to hold the blank against the face of the fixed cutting-tool *e* during its descent.

*f*⁵ is a set-screw, which acts as a stop to regulate the position of the gauge *g* in relation to the cutting-tool *f*.

h is a nipper, secured in the frame *a*, and when the nail-blank is brought into a suitable position, the moving nipper *i* is caused to press against the nail-blank, and hold it until the gripping-tools come into operation.

The gauge *g* is forked at the end, so as to allow of the nipper *i* to pass through it, and act as above described.

The nipper *i* is actuated in the following manner:

*i*² is a cam upon the axis *b*, and the cam *i*² acts upon the lever *i*³, moving upon the pin *i*⁴, carried by the bracket *i*⁵, secured to the frame *a*.

The nipper *i* is connected by a pin-joint to the lever *i*³, and moves in a recess formed in the slide *j*.

The nipper *i* is withdrawn from the nipper *h*, when allowed by the surface of the cam *i*², by means of a spring, *i*⁶, attached to the bracket *i*⁵, and pressing against the lever *i*³.

k *k*¹ are gripping-tools, below the cutting-tool *e*, secured in the frame *a* by means of the set-screws *k*²; and

l *l*¹ are the moving gripping-tools, secured in the slide *j* by means of the set-screws *l*².

The slide *j* moves in a groove, formed in the frame *a*, and after the nail-blank is brought into a proper position, by the means above described, the gripping-tools *l* *l*¹ are brought to bear according as the heading is to take place at either side of the machine, and hold the blank during the heading-operation in the following manner:

*j*³ is a cam on the axis *b*, which acts upon the lever *j*⁴, moving upon the pin *j*⁵, secured to the frame *a*, and the lever *j*⁴ presses against the end of the slide *j*, so as to bring the gripping-tools into operation, when required.

*j*⁶ is a spring, attached to the slide *j* and bracket *i*⁵, and this spring acts to withdraw the slide *j* and grippers *l* *l*¹, after the heading of the nail.

The slide *j* and lever *j*⁴ may, if desired, be secured by a link, to insure the withdrawal of the slide *j*, in case of accident to the spring *j*⁶.

When the blank is securely held between the gripping-tools, the heading-tools *m* and *n* are brought into operation upon the end of the nail-blank, projecting beyond the gripping-tools.

The heading-tools m and n , though they are moved up to the griper at each action of the machine, operate alternately to form the head of a nail, according to the angle of the machine when the blank was cut off.

The heading-tools m and n are secured in the slides m^1 and n^1 by means of the screws m^2 and n^2 , and the slides m^1 n^1 are supported and guided upon the frame a , at the points a^2 a^3 .

The heading-tools m and n are actuated in the following manner:

m^3 is a fly-wheel, and n^3 a toothed wheel, secured upon the axis b , and the fly-wheel m^3 and toothed wheel n^3 carry crank-pins, which communicate motion to the levers m^4 n^4 , by means of the connecting-rods m^5 n^5 .

The levers m^4 n^4 move on pins, secured in the brackets m^6 n^6 , fixed to the frame a .

m^7 n^7 are stirrups or connecting-links, by which the movement of the levers m^4 n^4 is communicated to the knuckle-joints m^8 n^8 , having their fulcrum upon the projections a^4 a^4 , upon the frame a , and the points m^9 n^9 , upon the slides m^1 n^1 .

m^{10} n^{10} are pins, fixed to the frame a , and acting upon the slides m^1 n^1 , so as to withdraw them and the heading-tools, after operating to form the head of the nail.

The axis b is of conical form at either end, and the fly-wheel m^3 and the toothed wheel n^3 are secured upon the axis b by means of the nuts b^1 b^2 , so that when the crank-pins are adjusted to the required position, by tightening the nuts b^1 b^2 , the fly-wheel m^3 and toothed wheel n^3 can be secured upon the axis b .

When the nail is finished, and the gripping and heading-tools withdrawn, the nail is allowed to fall through the opening p , in the frame a , into a receiver placed below the machine.

The frame a and parts attached are caused to oscillate from side to side, so as to cut the nail-plate, first at one angle, and then at the other, in the following manner:

o is a toothed wheel, driven by the toothed wheel n^3 , upon the axis b .

The toothed wheel o moves upon the stud o^1 , secured to the frame a , and carries a crank-pin, the throw of which is capable of adjustment.

c^3 is a bracket upon the stationary frame c , and o^2 is a connecting-rod, connected, by means of ball-joints, to the bracket c^3 and the crank-pin upon the wheel o , which, by its revolution, acting against the stationary bracket c^3 , causes the frame a and parts attached to oscillate.

The nail-plate, upon the feed-table d , is urged forward against the gauge g , as above described, by means

of the sliding piece d^3 , to which the weight d^4 is attached, by means of a cord passing over the pulleys d^5 d^6 ; and when the peg d^7 is removed, and the piece d^3 released, it is at once pulled by the weight to the lower end of the table d .

The nail-plate is inserted in the removable tongs d^8 , and with the tongs is placed on the table d , the tongs and nail-plate being supported upon and guided by ledges on either side of the table d .

The peg d^7 is then removed, and the piece d^3 allowed to press against the hinder end of the tongs d^8 , so as to urge the nail-plate forward, as above described, the tongs being so formed as to be capable of a partial rotation within their support, so as to allow the nail-plate to accommodate itself to the surface of the cutting-tool.

The part of the feed-table d^9 which is above the cutting-tool e , the nipper h , and the grippers k k^1 , is capable of being turned back upon the hinge-joints d^{10} , so as to afford ready access to the working-parts of the machine, without disturbing the position of the feed-table; and when the machine is in operation, the part d^9 is secured, by means of the nuts d^{11} , upon bolts carried upon brackets d^{12} .

d^{13} d^{14} are brackets, with adjustable set-screws, the ends of which act alternately, according to the angle of the machine, upon sliding pins on either side of the part d^9 , and the ends of the sliding pins come in contact with spring-pieces d^{15} , on either side of the part d^9 , so as to cause them to guide the edge of the nail-plate correctly.

Having thus described my invention, I would have it understood that I do not confine myself to the exact details, or to the particular form or arrangement of the parts herein described; but

What I do claim, is—

1. The construction and arrangement, upon the vibrating frame, of the sliding holders m^1 n^1 , toggle-joints m^8 n^8 , and levers m^4 n^4 , all operating together to give a rectilinear motion to the heading-dies, in the manner described.

2. The arrangement of mechanism, shown and described, for moving the grippers against the blank in a horizontal plane, as and for the purpose specified.

3. The improved nail-plate feeder, herein described, consisting of the jointed tables d d^9 , and the parts thereto attached, all constructed and operating together, as set forth.

MATTHEW JAMES RICE.

Witnesses:

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