

(No Model.)

2 Sheets—Sheet 1.

P. McDERMOTT.  
NAIL CUTTING MACHINE.

No. 370,965.

Patented Oct. 4, 1887.

Fig. 1

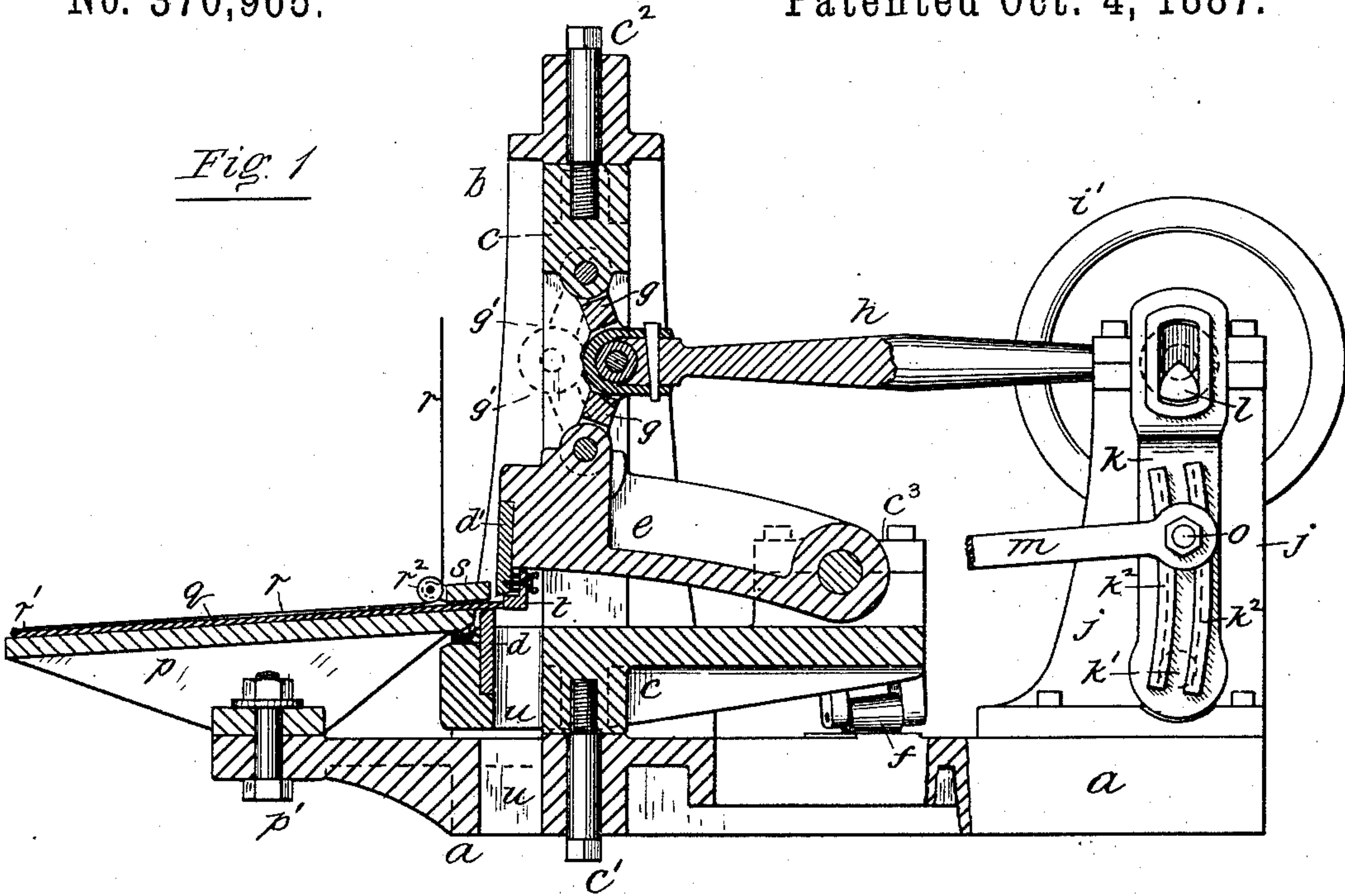
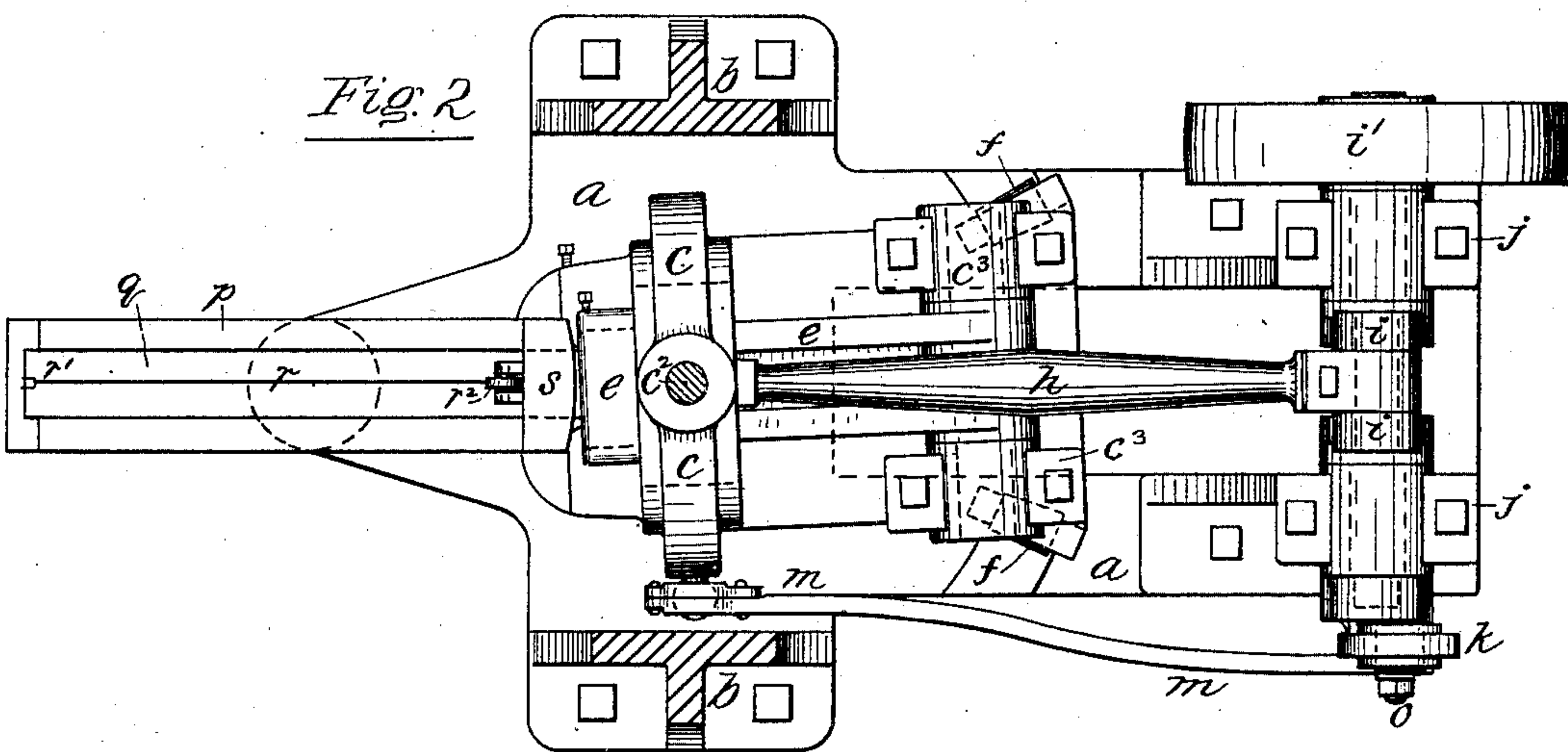


Fig. 2



Witnesses

H. D. Williams  
John A. Hamilton

Peter McDermott.  
Inventor  
per Alfred Sheddock.  
Att'y.

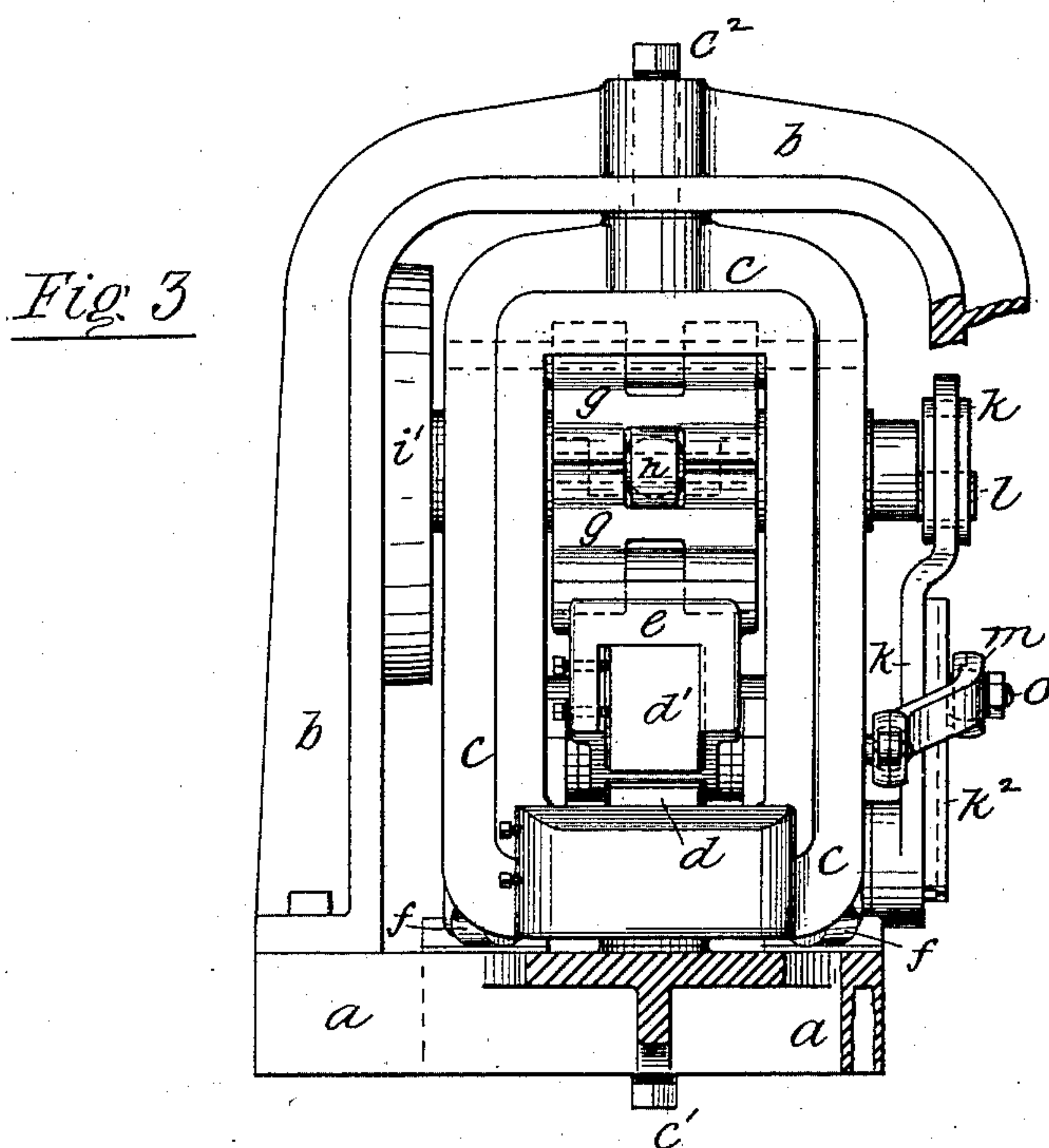
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H. D. Williams  
John A. Hamilton

Peter M. Dermott.

Inventor.  
per Alfred Sheldon  
Atty.



# UNITED STATES PATENT OFFICE.

PETER McDERMOTT, OF NEW YORK, ASSIGNOR OF ONE-HALF TO PATRICK REILLY, OF BROOKLYN, NEW YORK.

## NAIL-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 370,965, dated October 4, 1887.

Application filed November 3, 1886. Serial No. 217,871. (No model.)

*To all whom it may concern:*

Be it known that I, PETER McDERMOTT, a citizen of the United States, residing at New York, county and State of New York, have invented certain new and useful Improvements in Metal-Cutting Machines, of which the following is a specification.

My invention covers certain improvements in the construction and operation of machines for cutting wedge-shaped pieces from a bar or sheet of metal, in which the bar or sheet of metal is fed forward automatically without being moved laterally or turned over to be acted upon by the knives or dies; and these improvements consist of a fixed frame in which is vertically pivoted the frame or body of the machine carrying the cutting knives or dies, operating mechanism for causing the knives or dies to act on the bar or sheet of metal, and a cam and connecting device for rocking the pivoted frame, so as to set the cutting knives or dies in alternate angular positions to the direction of travel of the sheet or bar of metal presented to them, and holding the frame stationary during the cutting operation.

By reference had to the accompanying drawings and the following description thereof the nature and operation of my invention will be fully ascertained.

Figure 1, Sheet 1, is a part side elevation and part central section of my improved metal-cutting machine. Fig. 2, Sheet 1, is a plan view of the same, showing the fixed frame partly broken away; and Fig. 3, Sheet 2, is a front elevation with the fixed frame partly broken away to more clearly show the operating part of the machine.

On the bed-plate *a* is permanently secured the frame *b*, in which is held the frame *c* in such manner as to rock on a vertical axis by the studs or trunnions *c'* *c''*, fitted in the frame *c*, and having bearings in the frame *b* and bed-plate *a*.

In a bridge-piece at the front end of the pivoted frame *c* is securely held the lower knife, *d*, the upper counter-knife, *d'*, being secured in the end of the heavy lever or die-holder *e*, having bearings *e'* *e''*, secured to or forming part of an arm projecting rearwardly from the frame *c*. To support this rear part of the frame *c*, so as to relieve the trunnions *c'* *c''* from un-

due strain, rollers *f f* are placed between it and the bed-plate *a*. The knife or die holder, which, if desired, may be fitted to slide in vertical guides, as in ordinary cutting or punching presses, is vertically reciprocated through the medium of the toggle-levers *g g*, the connecting-rod *h*, and the crank *i*, the shaft of which rotates in bearings formed in the standards *j j*, secured to the rear end of the bed-plate *a*, motion being imparted to the crank-shaft by means of a belt running over the pulley *i'*. The bearings of the connecting-rod *h* are made spherical.

The means adopted by me to cause the frame *c* to rock on its trunnions consist of a lever, *k*, pivoted at *k'* to the lower part of one of the standards *j*, and having a slot at its upper end opposite the end of the crank-shaft, the equilateral triangular cam *l*, secured to or formed on the end of the crank-shaft and acting in said slot in the lever without lost motion as the crank-shaft is caused to rotate, and the connecting-rod *m*, attached at one end to the side of the frame *c* by means of a ball-joint and at the other end by means of a sliding bolt, *o*, to the ways *k''*, formed on the front of the lever *k*. By means of the sliding bolt *o* and ways *k''* any desired amount of rocking motion may be imparted to the frame *c*; to set the knives or dies carried thereby in the requisite angular positions relatively to the sheet or bar of metal to be acted upon by them, and said ways are curved, as shown, the center of their curvature being the center of the ball-joint connection of the rod *m* with the frame *c* when the frame is in its central position and the lever *k* vertical, as shown at Fig. 1, so that, wherever the bolt *o* may be located in the ways *k''*, the frame *c* will be alternately rocked from a central position by the action of the cam *l* on the lever *k*, excepting when the bolt *o* is set directly over the pivotal connection *k'* of the lever *k*. When the bolt *o* is in this position, no motion will be imparted to the frame *c*, and the knives *d d'* will cut parallel pieces from the sheet or bar of metal.

A guide, *p*, is located in front of the knives *d d'*, and is preferably pivoted to the bed-plate *a*, as at *p'*, to permit its being turned away from the knives when it is necessary to adjust them or remove them from the machine. In



this guide *p* is placed the sheet or bar of metal, *q*, which is automatically fed forward toward the knives *d d'* by means of any suitable feeding device—as, for instance, a chain or rope, *r*, attached to the outer end of the sheet or bar *q* by a gripper or hook, *r'*, and passing under the pulley *r<sup>2</sup>* on the stripper *s* and over pulleys suitably located overhead, its free end carrying a weight sufficient to overcome the friction of the sheet *q* in the guide *p*.

To determine the width of the pieces cut off the end of the sheet or bar *q* by the knives *d d'* an adjustable stop, *t*, is secured to the upper knife, *d'*, against which the end of the sheet or bar comes in contact each time the upper knife passes above the opening in the stripper *s*. The pieces or nails, as the case may be, cut from the sheet or bar *q* fall through the opening *u* in the frame *c* and bed-plate *a*.

Now it will be observed that during each full revolution of the crank-shaft the cam *l* will move the frame *c* into its two angular positions and hold it in such positions a sufficient length of time for the cutter *d'* to be forced through the material acted upon, the crank *i* being so set in relation to the cam *l* that, through the medium of the connecting-rod *h*, it then brings the toggle-levers *g g* to a vertical position. In the plan view, Fig. 2, the parts of the machine are shown in one of the active cutting positions.

It will also be observed that, as the knives or dies are thus placed in two cutting positions by each revolution of the crank-shaft, it becomes necessary to straighten out the toggle-levers twice during each revolution. This I accomplish by making the throw of the crank *i* such that it will carry the central joint of the toggle-levers beyond a central position after each straightening of the same, as indicated by the dotted lines *g' g'* in Fig. 1, thus departing from the ordinary manner of operating toggles by a crank, in which the toggles are straightened at the end of the throw of the crank.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for cutting wedge-shaped pieces from a bar or sheet of metal, in combination, a stationary frame, a frame carrying knives or dies and toggle-levers pivoted in the fixed frame, a crank and connecting-rod for actuating the toggle-levers, a rocking lever, a connecting-rod joining the rocking lever to the pivoted frame, and a cam on the end of the crank-shaft for actuating the rocking lever, substantially as set forth.

2. In a metal-cutting machine, a frame, a knife or die holder fitted therein, toggle-levers arranged to reciprocate the knife or die holder when moved to and from a vertical position, and a rotating crank and connecting-rod joining it to the central joint of the toggle-levers, the throw of said crank being such as to move the central joint of the toggle-levers on each side of their vertical position, whereby the knife or die holder is reciprocated twice each time the crank makes a full revolution, substantially as set forth.

3. In a metal-cutting machine, in combination, the pivoted frame *c*, knives or dies carried thereby, and mechanism for operating the same, the connecting-rod *m*, the lever *k*, and the cam *l*, substantially as set forth.

4. In a metal-cutting machine, in combination, the pivoted frame *c*, knives or dies carried thereby, and mechanism for operating the same, the connecting-rod *m*, the lever *k*, the cam *l*, and the fixed guide *p*, provided with stripper *s*, substantially as and for the purpose set forth.

5. In a metal-cutting machine, in combination, the fixed frame *b*, the pivoted frame *c*, the knife or die holder *e*, the toggle-levers *g g*, the connecting-rod *h*, the crank *i*, the cam *l*, secured to the shaft of the crank, the lever *k*, and the rod *m*, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand, at New York, county and State of New York, this 27th day of October, 1886.

PETER McDERMOTT.

Witnesses:

PATRICK REILLY,  
H. D. WILLIAMS.