

(Model.)

3 Sheets—Sheet 1.

G. H. PERKINS.  
Nailing Machine.

No. 243,611.

Patented June 28, 1881.

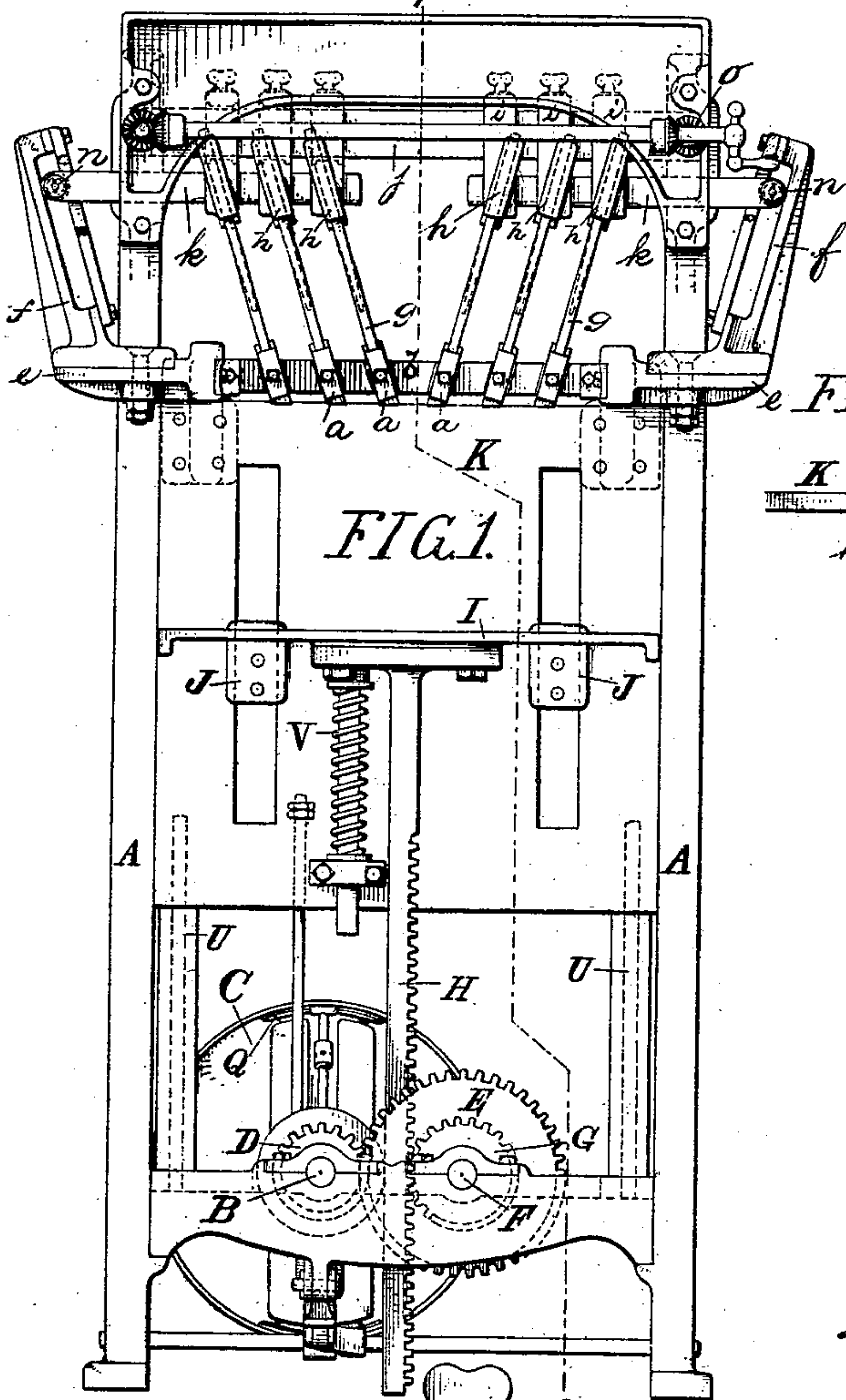


FIG. 1.

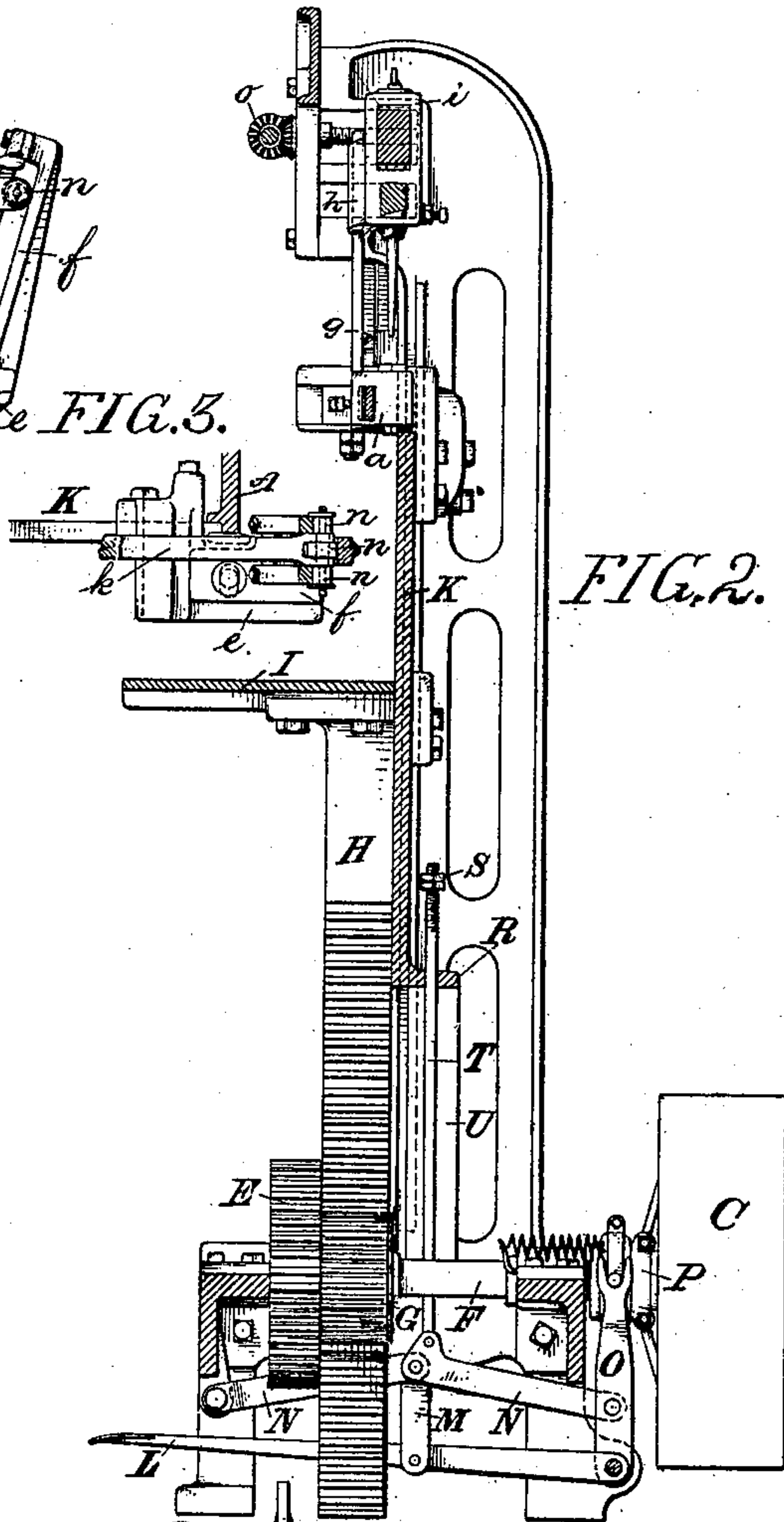


FIG. 2.

FIG. 4.

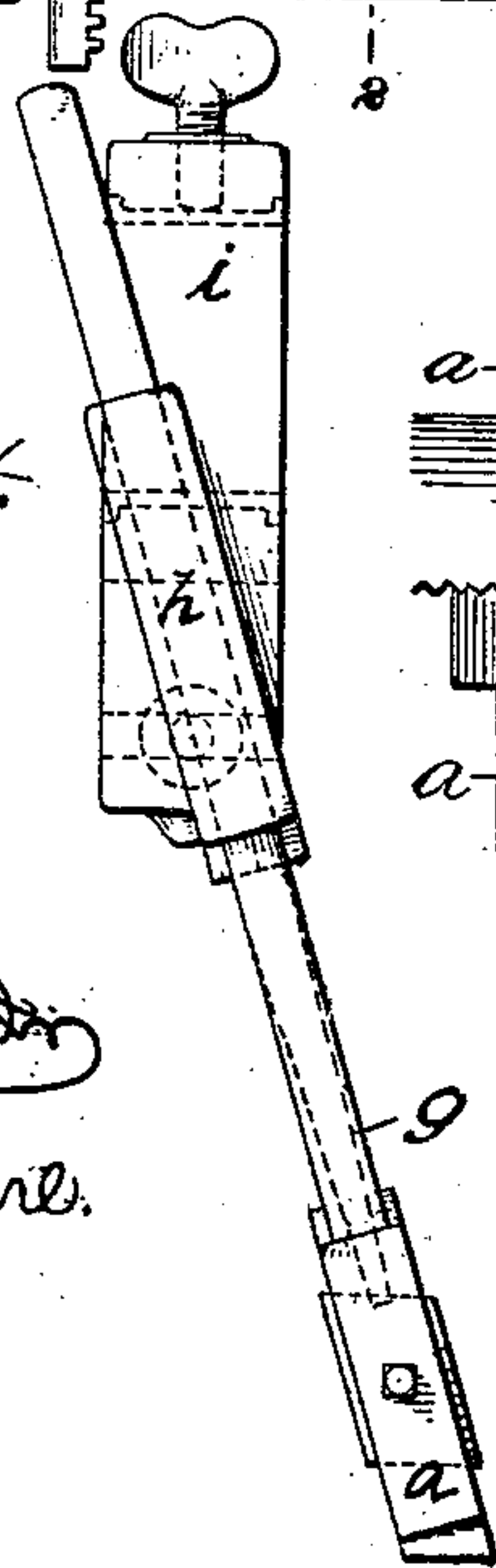


FIG. 6.

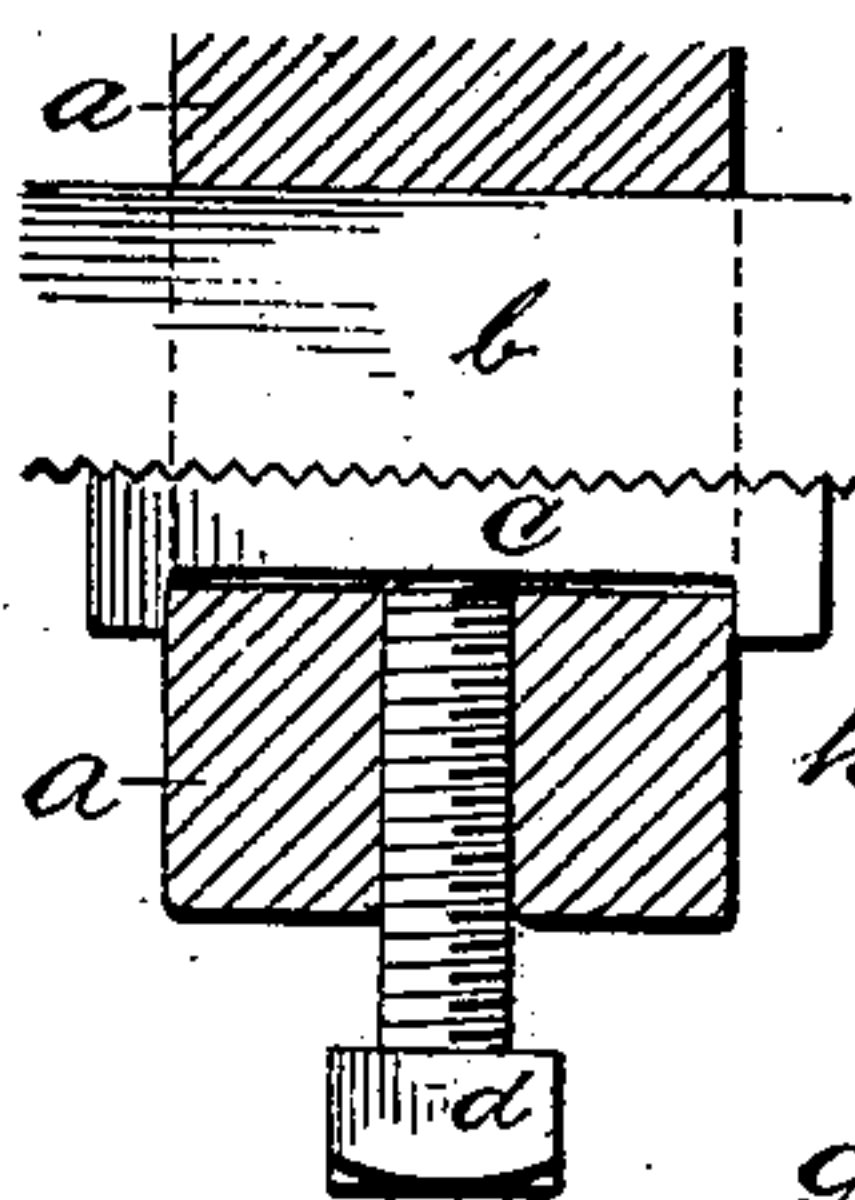
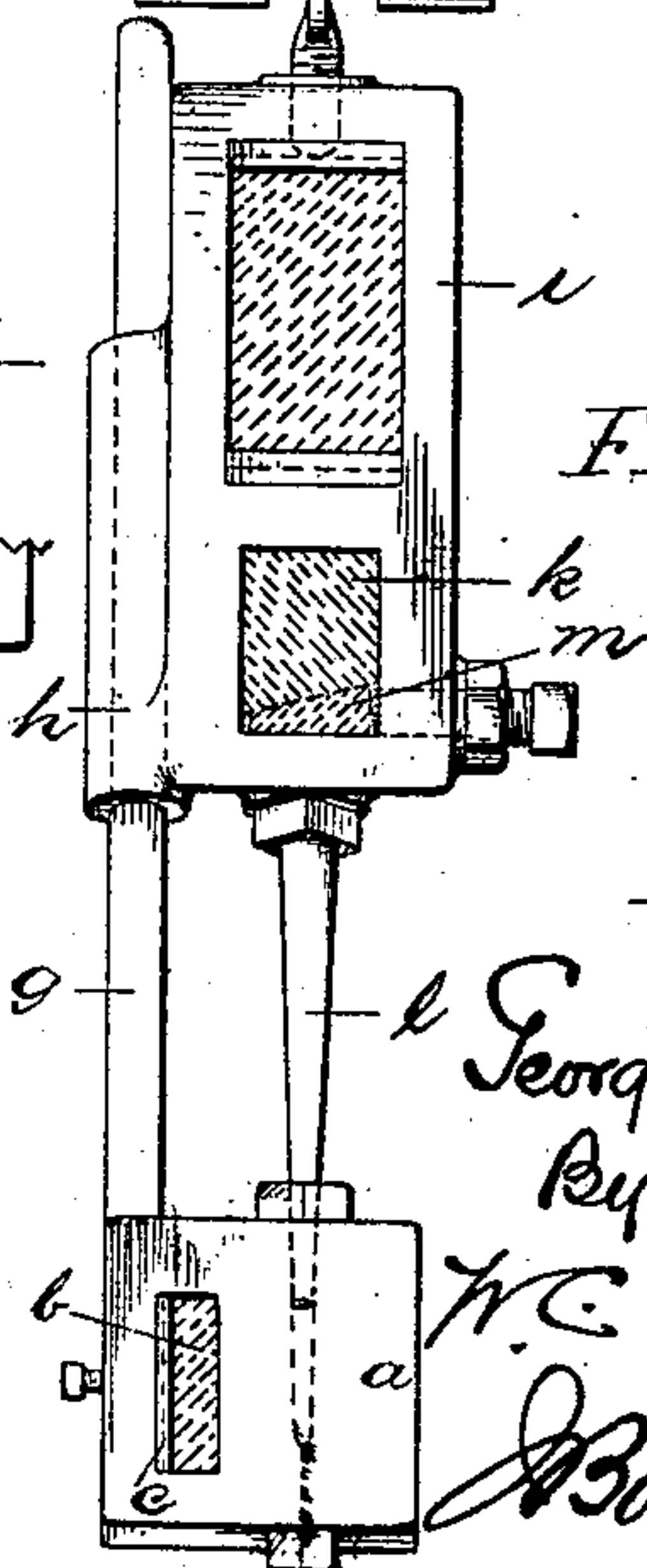


FIG. 5.



Attest,  
*John D. [Signature]*  
Ashbel E. Ware.

Inventor,  
George H. Perkins  
By his Attorneys,  
W. C. Strawbridge,  
Bonsall Taylor.

(Model.)

3 Sheets—Sheet 2.

G. H. PERKINS.  
Nailing Machine.

No. 243,611.

Patented June 28, 1881.

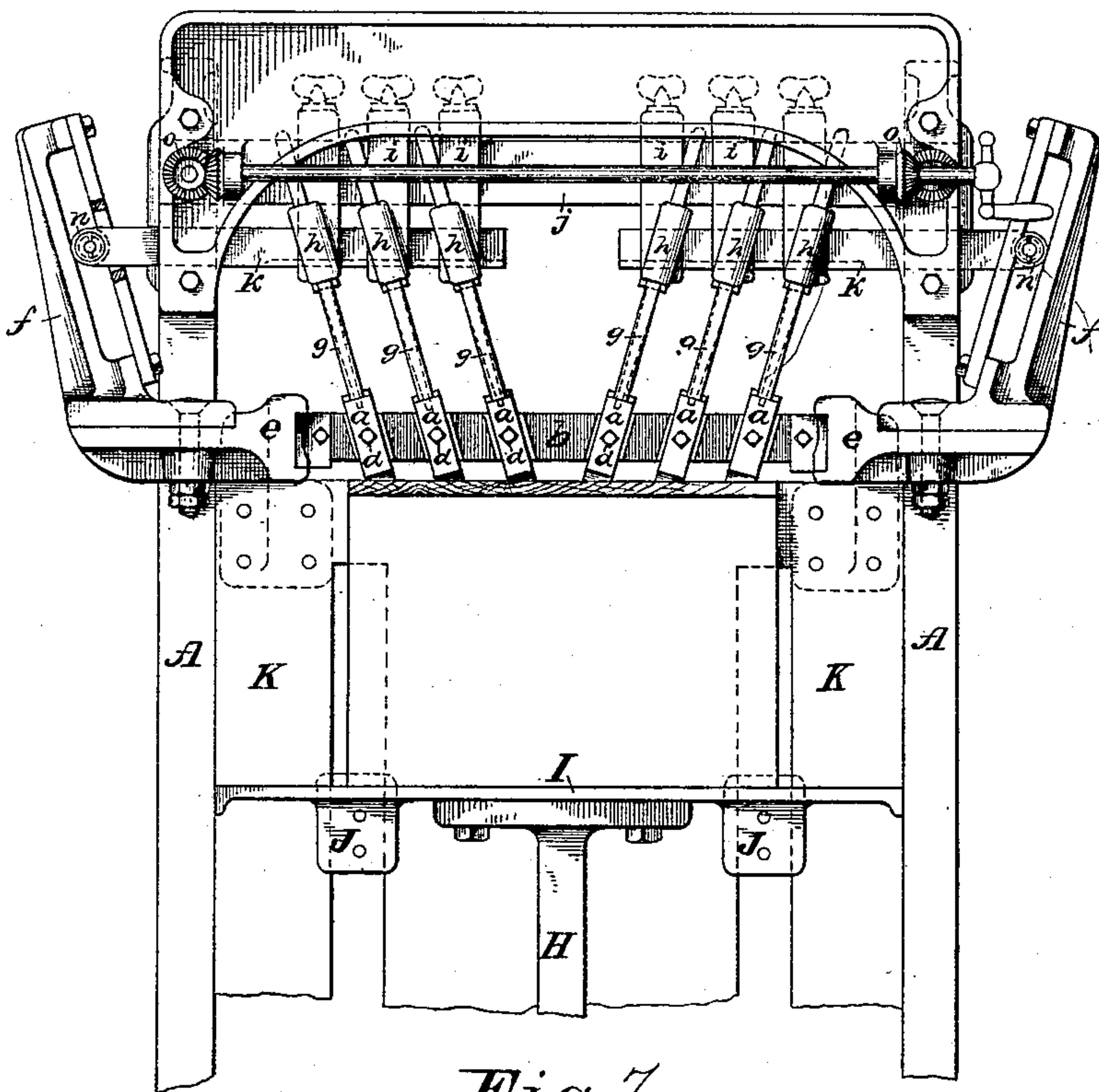


Fig. 7.

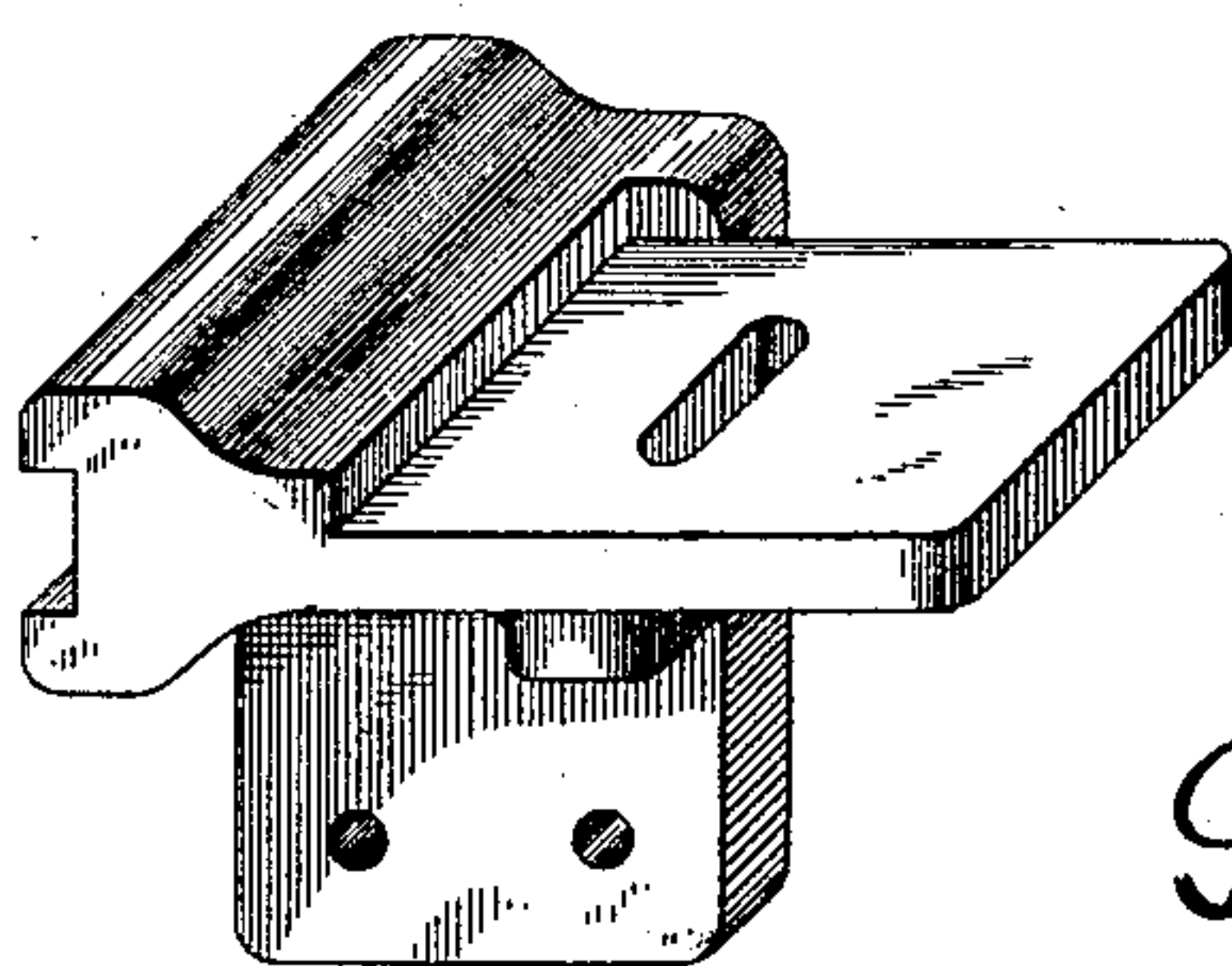


Fig. 8.

Attests:

J. H. Templin.  
*John D. Kelley*

George H. Perkins,  
Inventor.

By his Attorney,  
*W. C. Strawbridge*  
*John S. Taylor*



(Model.)

3 Sheets—Sheet 3.

G. H. PERKINS.  
Nailing Machine.

No. 243,611.

Patented June 28, 1881.

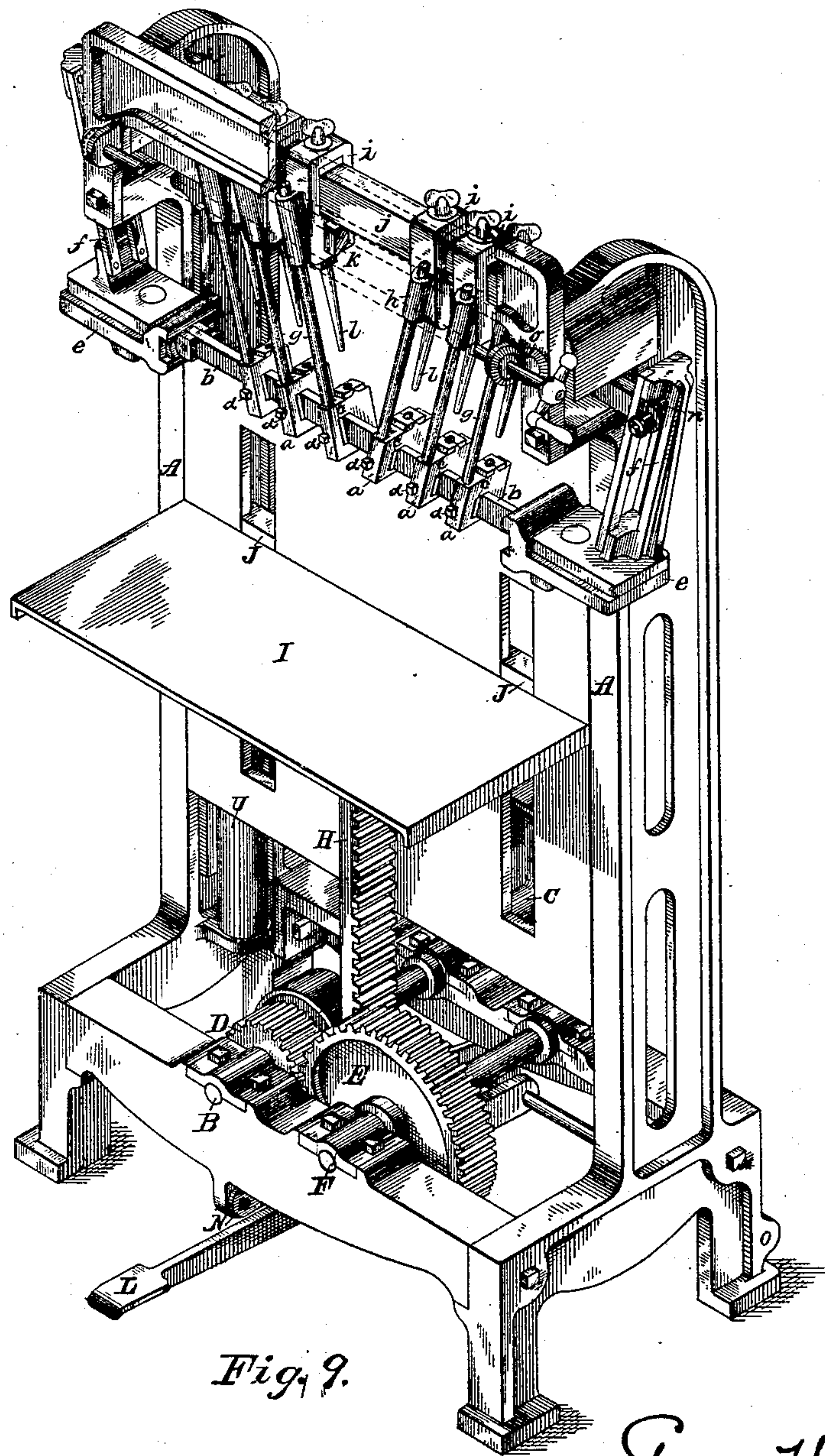


Fig. 9.

Attests.  
J. H. Templin.  
John D. Kelley

George H. Perkins,  
Inventor.  
By his Attorney,  
W. C. Strawbridge,  
Bonsall Taylor.



# UNITED STATES PATENT OFFICE.

GEORGE H. PERKINS, OF PHILADELPHIA, PENNSYLVANIA.

## NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 243,611, dated June 28, 1881.

Application filed June 21, 1880. (Model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. PERKINS, of the city of Philadelphia, in the State of Pennsylvania, have invented an Improvement  
5 in Nailing-Machines, of which the following is a specification.

My invention relates in general to box-nailing machines, or devices for automatically nailing together boards or pieces of separate material; and it relates more specifically to the  
10 class of box-nailing machines of which the machine patented to Edwin Beard, in and by Letters Patent No. 157,568, dated December 8, 1874, is a type.

15 In the above class of machinery, the operative principle is that the box or other thing to be nailed is placed upon a table which is adapted by suitable mechanism to be elevated into contact with nail-holders, which are, in  
20 turn, adapted to be elevated by the box, whereby fixed plungers are caused to enter them and drive into the box nails previously placed within said nail-holders.

In the accompanying drawings, Figure 1 is  
25 a front elevation of a machine embodying my invention; Fig. 2, a side elevation of the same, sectioned on the line 1 2 of Fig. 1; Fig. 3, a top-plan view of one of the inclines by which the plunger-carriers are thrown inward by  
30 the action of the machine, as hereinafter set forth; Fig. 4, a front elevational detail of the plunger-carrier, nail-holder, and guide-rod connecting the two; Fig. 5, a side elevation of the same; Fig. 6, a top sectional view of a  
35 convenient means of attaching the nail-holders to the nail-holder bar. Fig. 7 is an enlarged front elevation of the upper portion of my improved machine, representing most clearly the devices invented by me, by the application of  
40 which to the Beard machine the latter is adapted for the angular driving of nails. Fig. 8 is a perspective detail of one of the castings *e*, upon which the inclines *f* are supported, which adjustably retain the nail-holder bar,  
45 and which themselves are secured to and carried by the gate. Fig. 9 is a view, in perspective, of the entire machine.

Similar letters of reference indicate corresponding parts.

50 In the accompanying drawings, A is the housing or frame-work of the machine, being

a casting of suitable construction and conformation, and preferably of the character shown.

B is a driving-shaft, journaled in the base 55 of the machine, and provided with a driving-pulley, C, (of the character well known as the "Mason driving-wheel and clutch device,") at one extremity, and with a driving toothed wheel, D, at the other extremity. The driving toothed  
60 wheel meshes with a gear-wheel, E, suitably placed upon a shaft, F, parallel with the shaft B, upon which shaft F is also rigidly affixed a pinion, G, meshing with a vertical rack, H, upon the upper extremity of which is supported  
65 a table or traveling bed, I, upon which the box to be nailed is placed. The bed is suitably arranged, by means of sliding journals J, or the like, to reciprocate vertically against the gate or face-plate K of the machine. 70

Upon the driving-shaft is arranged the friction-clutch known as "Mason's," whereby the pulley C is made tight or loose. This clutch consists, essentially, of a toggle operated by a  
75 treadle, L, connected by a link, M, to the toggle-bars N N. By the pressing of the treadle, and thereby the straightening out of the toggle-bars, the toggle-lever O is thrown to the right hand of Fig. 2, so as to carry with it a  
80 sliding sleeve, P, feathered upon the shaft, to which are connected toggle brake-blocks Q, which latter by such action are locked against the pulley, so as to cause the pulley to revolve the sleeve and with the sleeve the driving-shaft. Upon the revolution of the driving-shaft the  
85 pinion G is revolved, and by its revolution it drives up the rack and with it the table to the required height. As the rack and table ascend the box encounters the nail-holders, and, lifting the latter, thereby occasions the lifting of the  
90 gate (which is also arranged to travel vertically in the frame-work) until a ledge, R, at the rear of the gate encounters a nut, S, or other stop upon the extremity of a vertical rod, T, connected with the toggle-bars N, and lifts the same,  
95 whereby the toggle-bars are lifted or crooked, so as to retract the toggle-lever O, disengage the brake-blocks, and stop the revolution of the driving-shaft. The nut S is so placed as to release the friction-clutch and thereby cause the  
100 stoppage of the driving-shaft and the consequent further ascent of the table and rack at



the exact time when the nails have been driven home. Upon the stoppage of the revolution of the driving-shaft and the ascent of the table, the table, gate, and rack descend by gravity to their first position, in which they are in readiness to receive the box. The descent of the face-plate is rendered secure and without shock by the application of rubber cushions *U* beneath it, that of the table by the application of a spiral spring, *V*, or other cushion device, arranged between the under surface of the table and a fixed projection upon the face of the gate. After the placing of a new box the treadle is depressed and the machine brought into action to the repetition of the operation just described.

The mechanism above described is not invented by me, but is now in use in nailing-machines of various constructions. Heretofore, however, in machines of the above class—that is to say, machines in which the nail-plunger is stationary and the nail-holder driven up upon the plunger—it has been impossible to drive nails at angles.

The object of my present invention is to adapt the above class of machines to the driving of nails at angles, and to accomplish the same I have devised the following mechanism, which I apply to the upper frame-work of a machine embodying the construction hereinbefore set forth.

*a* is a nail-holder, any number of which are adjusted at the desired angle upon a horizontal nail-holder bar, *b*. They are preferably secured on the bar by such a device as is represented in Fig. 6, which consists in a nail-holder bar one edge of which is roughened, and against which a key, *c*, similarly roughened, is laid between the bar and the nail-holder, the parts being tightened together by an adjusting-screw, *d*. At both of its ends the nail-holder bar is secured to laterally-extending castings *e*, secured to the top portion of the gate of the machine and adapted to be lifted with it. These castings *e* support inclines *f*, whose angle is made correspondent to the angle of the discharge-orifice of the nail-holder and to the angle of the plunger.

To the nail-holders are rigidly secured guide-rods *g*, which pass up and through sleeves *h* on the front faces of the plunger-carriers *i*, a series of which latter, corresponding in number to the nail-holders, is employed. These plunger-carriers are adjusted upon a plunger-carrier bar, *j*, arranged horizontally across the top frame-work of the machine in such manner as to be adapted to slide laterally thereupon when caused so to do by slide-bars *k*, which are rigidly connected to the plunger-carriers below the plunger-carrier bar.

*l* is a plunger, a suitable number of which are employed, and are conveniently secured within the plunger-carriers by wedges or key devices *m*, as shown in Fig. 5.

The slide-bars are equipped upon their outer ends with friction-rolls *n*, which play within the inclines *f*.

Such being the construction of the above device, its operation is as follows: When the box has been elevated so as to come into contact with the nail-holders and to raise the latter the gate is also raised, and with it the castings which support the inclines. As the nail-holders travel upward the guide-rods are caused to travel through their sleeves in the plunger-carriers, and it becomes essential that the plunger-carriers should be moved inward to an extent sufficient to take up the difference in position occasioned by the inclination of the nail-holders and the nearer approach of the nail-holders to the plunger-carriers, which movement is effected by the inclines, which are, as stated, at the same angle as the guide-rods and plungers, and which cause the slide-bars to travel inward and with them carry inward the plunger-carriers along and upon the plunger-carrier bar, the action and extent of the movement being exactly proportionate to the change of position of the sleeves rendered necessary by the upward movement of the nail-holders.

It is obvious, of course, that the inclines must be set at angles parallel with the guide-rods, and also that whereas in Fig. 1 the nail-holders are shown equally divided and equally at opposite inclinations, yet that each incline must correspond to the angle of the nail-holders which it is designed to co-operate with. It is, however, to be understood that more than two inclines may be employed and a correspondent series of slide-bars and plunger-carrier bars upon which separate plunger-carriers may be placed, whereby each nail-holder may, if desired, be arranged at an angle different from that of the nail-holder contiguous to it or any other nail-holder in the set, any such changes as the above being obvious to a skilled mechanic.

I have arranged my machine in such manner that it is adapted for use with lumber of varying thicknesses by applying the nail-holder bar adjustably to the gate in such manner that it may be set out in front to a given extent or set back, the arrangement being conveniently made by so shaping the castings *e* as to cause them to extend laterally out and form a bearing or surface wide enough to permit of such movement. A corresponding drawing in or out of the plunger-carriers and their connections is rendered possible by the application of bevel-gearing *s* to the plunger-carriers, as shown in Figs. 1, 2, 7, and 9, whereby the plunger-carriers are thrown in or out.

The nail-holders which I employ are of the character employed by Beard, as specifically recited in his patent hereinbefore referred to.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a box-nailing machine in which the table or box-supporting device is driven up upon the nail-holders and the nail-holders driven up upon fixed plungers, the combination of a series of nail-holders arranged at given



inclinations, a series of vertically-fixed but laterally-movable plungers arranged at corresponding inclinations, and mechanism for directing the plungers without variance and at the proper angles to enter said nail-holders, substantially as set forth.

2. In a box-nailing machine, the inclines *f*, operated as set forth, and slide-bars *k* connected with sliding plunger-carriers, in combination with the guide-rods *g* rigidly connected with the nail-holders and traveling through sleeves *h* on the plunger-carriers, con-

stituting a mechanism whereby one or more angled plungers are caused, without variance and at the proper angles, to enter one or more correspondingly-angled nail-holders, substantially as described.

In testimony whereof I have hereunto signed my name this 1st day of May, A. D. 1880.

GEORGE H. PERKINS.

In presence of—

C. B. TAYLOR,  
J. BONSALE TAYLOR.