

(No Model.)

G. H. PERKINS.  
Nailing Machine.

No. 243,610.

Patented June 28, 1881.

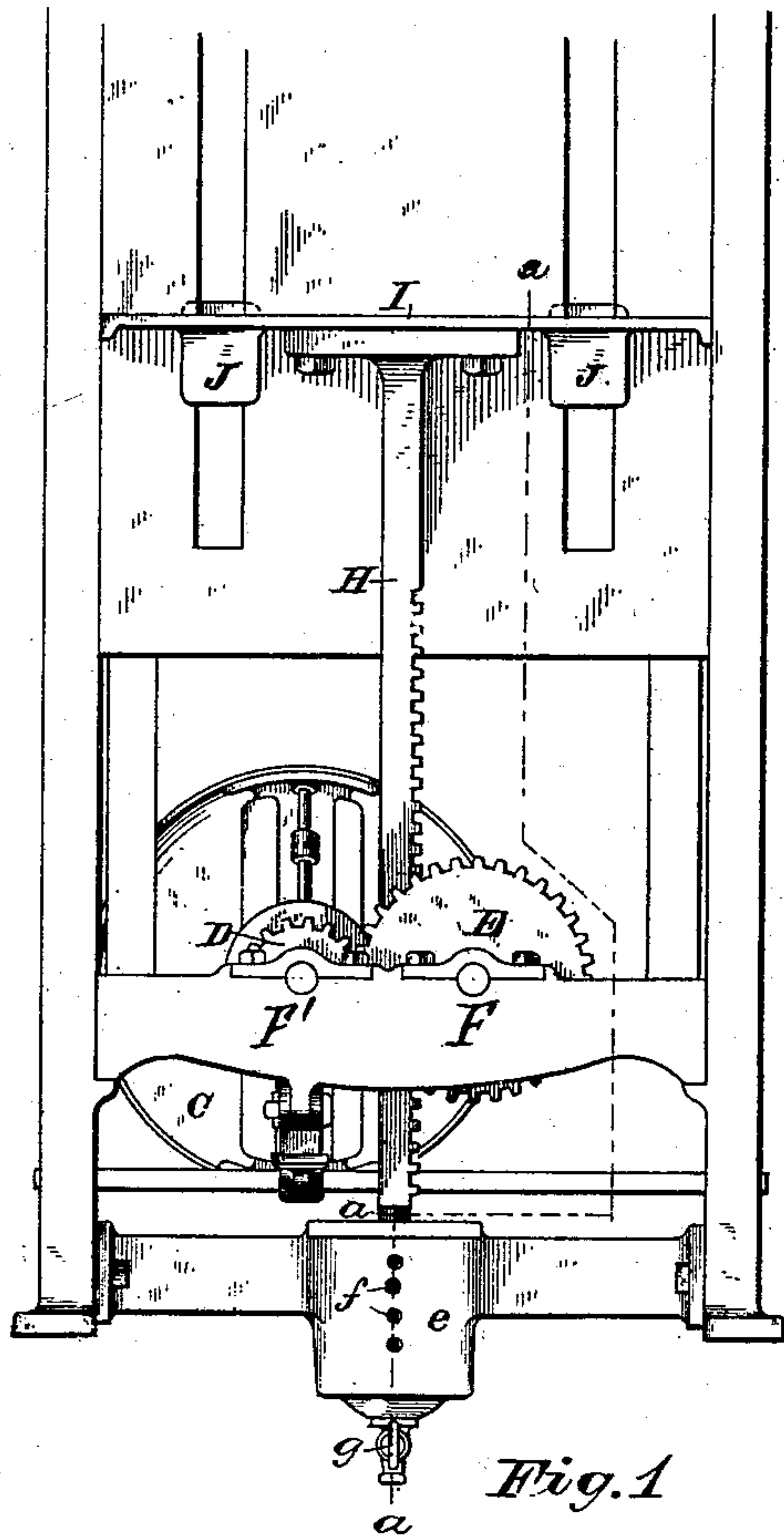


Fig. 1

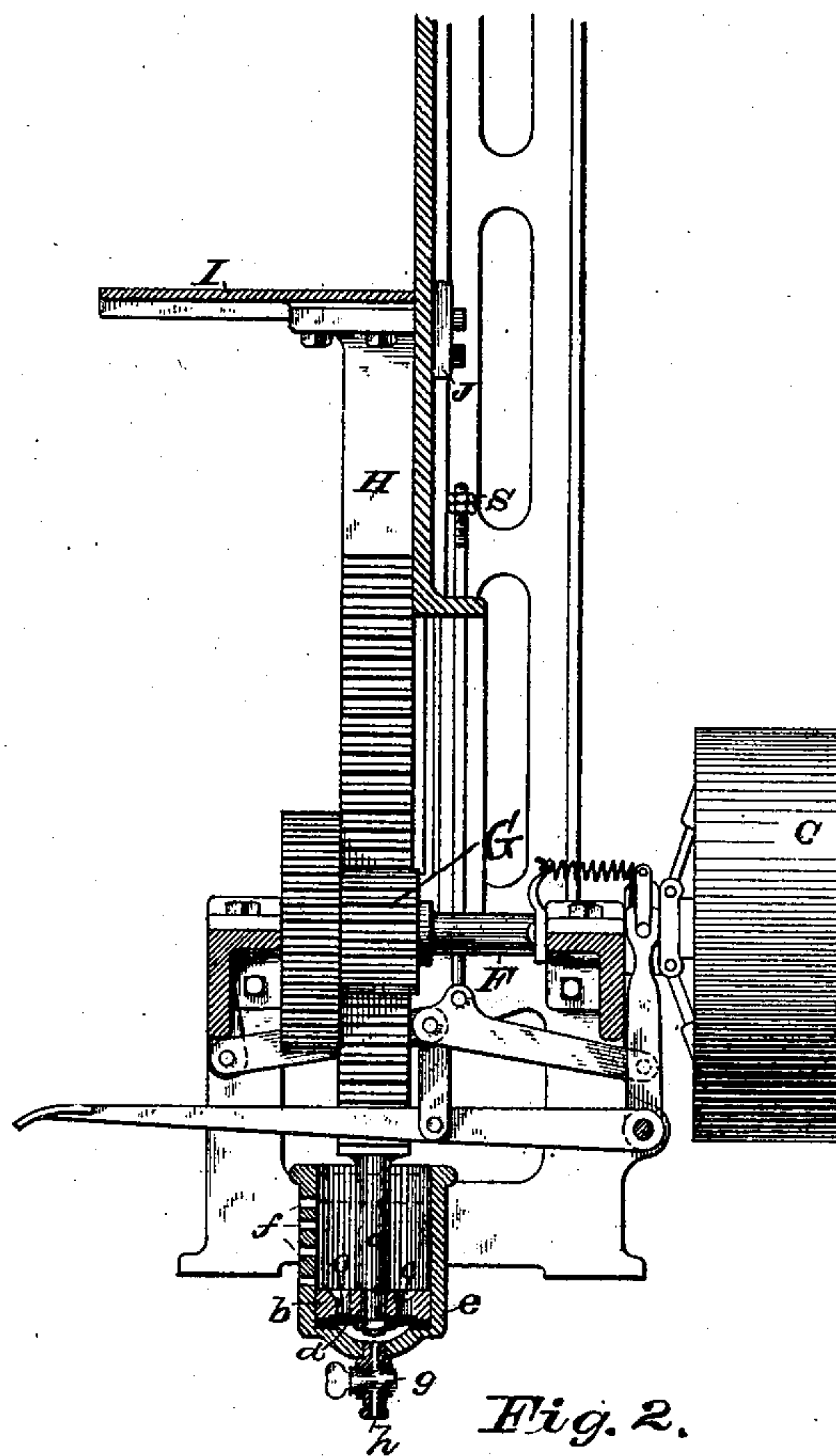


Fig. 2.

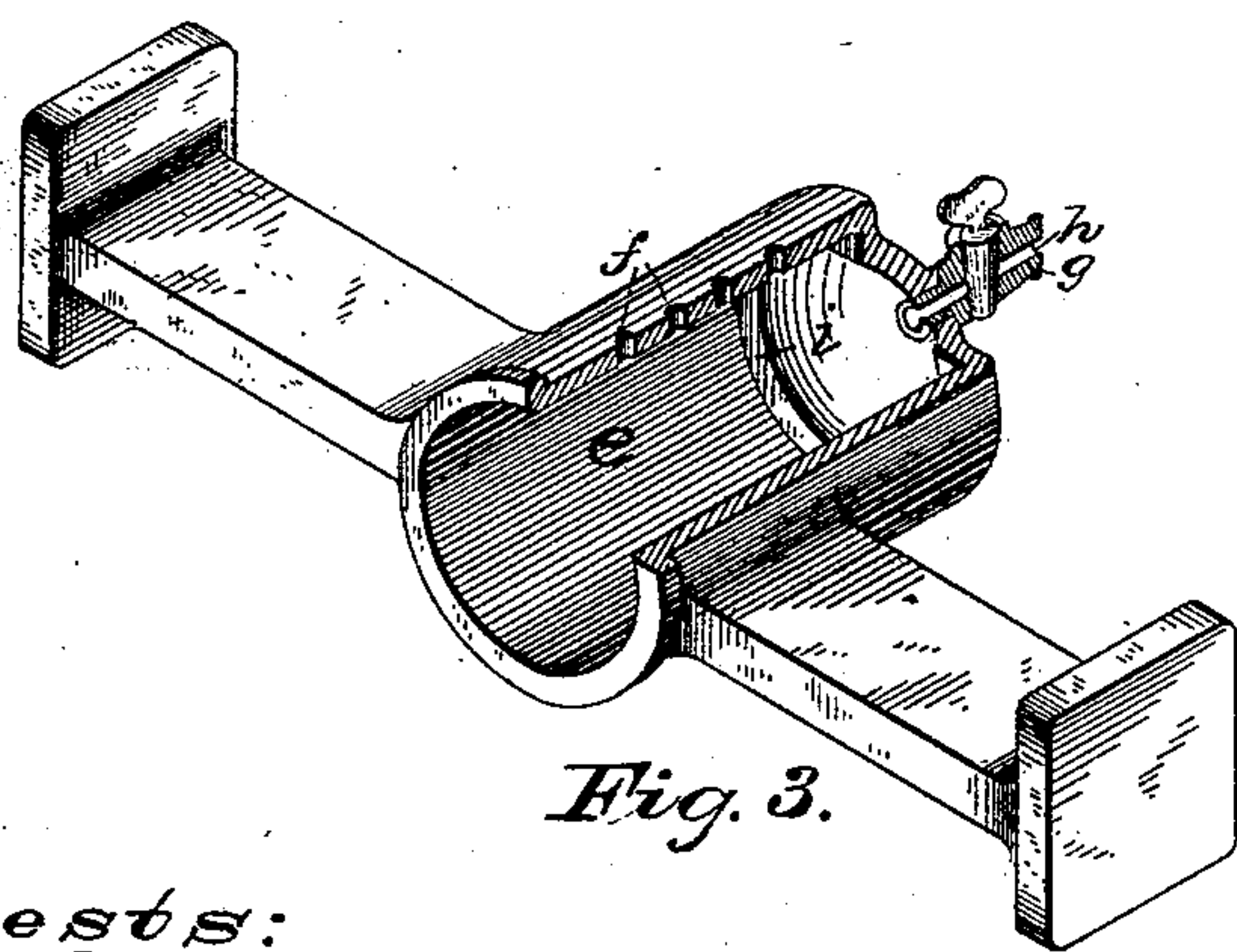


Fig. 3.

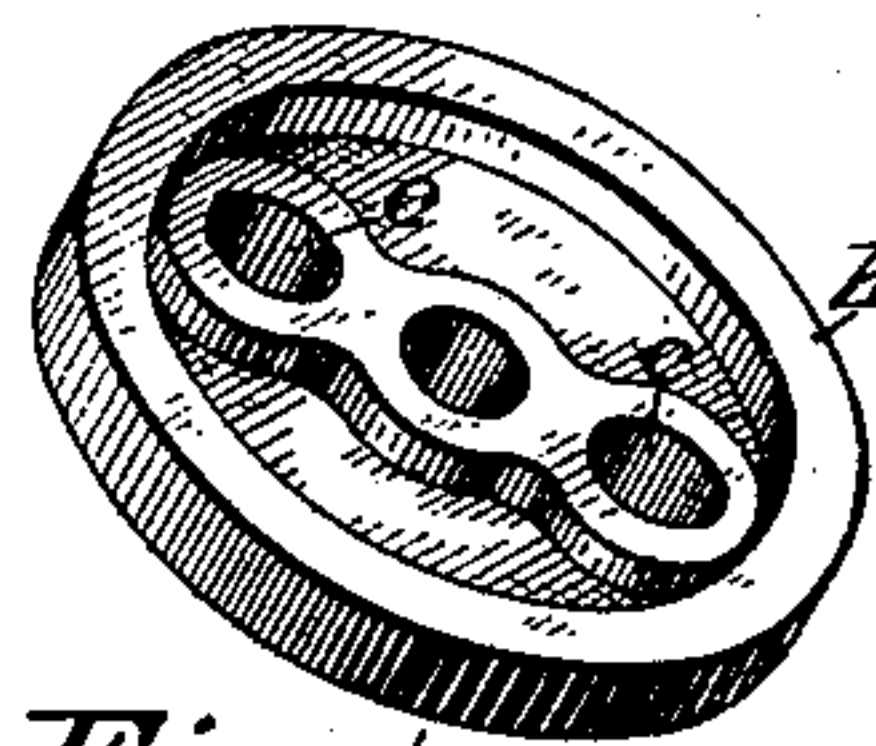


Fig. 4.



Fig. 5.

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# UNITED STATES PATENT OFFICE.

GEORGE H. PERKINS, OF PHILADELPHIA, PENNSYLVANIA.

## NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 243,610, dated June 28, 1881.

Application filed February 23, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. PERKINS, of Philadelphia, Pennsylvania, have invented an Improvement in Nailing-Machines, of which  
5 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 that  
10 class of box-nailing machines in which 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,  
15 in 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.

The object of the invention is to provide a  
20 means for effectually counteracting the shock occasioned by the descent of the table after the box has been nailed.

In the above class of machinery the elevation of the table is secured by means of a rack  
25 or kindred device operated by means of a pinion from a system of gearing, the table riding in suitable vertical ways in the frame-work of the machine.

The object of my invention is to provide, in  
30 combination with the rack and table, an air-cushioning device which shall be adapted to receive and break the shock of the return of the table and rack after their upward throw is ended. Heretofore an effort has been made  
35 to counteract the shock of such return by means of spiral or rubber springs and the like, without, however, that certainty of result which is essential to wholly prevent damage to the operative mechanism.

40 In the accompanying drawings, Figure 1 is a front elevation of the lower portion of the frame-work of a nailing-machine embodying my invention, and of the table-elevating machinery; Fig. 2, a central side sectional elevation of the same on line *a a* of Fig. 1; Fig.  
45 3, a perspective detail, partially sectioned, of the dash-pot or cushioning-chamber; Fig. 4, a similar view of the cushioning-plunger which plays within said chamber; Fig. 5, a perspective detail of the valve of the cushioning-plunger.  
50

In the accompanying drawings, I represents the table upon which the box to be nailed is placed.

J are sliding journals supporting and steady-  
55 ing the throw of the table.

H is a vertical rack affixed to the under surface of the table and extending downwardly to the base of the machine.

G is a pinion engaging with the rack and  
60 causing the elevation of the latter. This pinion is keyed upon the shaft F, which also carries the gear-wheel E, which latter engages with and takes its movement from the driving tooth-  
65 ed wheel D upon the driving-shaft F', journaled in the base of the machine, to which shaft F' is also applied, by means of any suitable clutch-device, a driving-pulley, C, such as that known as the "Mason driving-wheel and clutch," and  
70 represented in the drawings.

*a* is a stem in which the lower extremity of the rack terminates. This stem may be either formed as an integral portion of the rack or affixed thereto by suitable means.

*b* is a cushioning-plunger secured upon the  
75 lower extremity of the stem *a*. This plunger is perforated by two openings, *c*, which are closed upon the under side by means of the valve *d*, formed of leather or kindred material, and affixed to the stem *a* upon the under surface of  
80 the cushioning-plunger.

*e* is a cushioning-chamber, being a cylinder open above and tightly closed below, within which the cushioning-plunger reciprocates. The fit of the parts is accurate, so that air can-  
85 not escape about the sides of the plunger.

*f* are a series of perforations or vents formed in the side of the chamber in vertical series.

*i* is a packing-ring at base of chamber, to aid in obviating concussion.

*g* is a cock fitted to an orifice, *h*, in the base of the chamber.

The operation of the device is as follows: After the rack and table have been elevated by the pinion G to the proper extent, and the  
95 trip S has operated in the usual manner to release the clutch and set free the driving-shaft F, the table and rack descend by gravity, rotating with them the released gearing. As this descent takes place the cushioning-plunger  
100 is rapidly driven home into its chamber, forcing the air from out the chamber in rapid suc-



cession through the series of vents *f* until such time as the plunger has passed the lowermost of the series. After the plunger has passed the lowermost vent the compressed air in the base of the chamber can find its only escape through the orifice *h*, which can be regulated in size of opening by the cock above referred to. In this descent of the plunger the valve *d* is, of course, kept in close contact with the openings *c* through the plunger, so as to completely close them and prevent the escape of the compressed air through the openings. Upon the return of the rack and table, as the latter are driven upward the pressure of air through the openings *c* upon the valve forces it upward and away from the openings, prevents suction and the consequent holding down of the plunger, and permits of the introduction of air below the plunger and within the chamber, in which introduction the series of perforations *f*, as the plunger is lifted successively above them, aids.

It will be observed that the cushioning action is gradual, by reason of the fact that in the commencement of the descent of the plunger the air can escape through all of the perforations simultaneously; but as the plunger descends one vent after another is closed, and the air remaining in the chamber more and more compressed, until, as above stated, its final escape is solely by the orifice *h*, which itself may be more or less closed to regulate to a nicety the cushioning action shall take place.

By the above means, as will be readily understood, the shocks heretofore occasioned by the descent of the table and rack are obviated, and the strains and jarrings heretofore incident to such descent and injuriously effecting the operative mechanism of the nailing-machines avoided.

It is obvious, of course, that instead of fixing the plunger to the rack in the manner hereinbefore explained, the chamber may be inverted and applied to the rack, and the plunger erected upon a fixed standard or the like.

Having thus described my invention, I claim—

1. In combination with the table and lifting-rack of a nailing-machine, a stationary chamber fitted with a plunger connected to said rack and working within the chamber.

2. The chamber *e*, provided with the vertical series of perforations *f*, and the cock-controlled orifice *h*, in combination with the plunger *b*, provided with a valve, *d*, substantially as and for the purpose set forth.

3. In combination with the plunger *b*, provided with the openings *c*, the valve *d*, as and for the purpose set forth.

In testimony whereof I have hereunto signed my name this 15th day of February, 1881.

GEORGE H. PERKINS.

In presence of—

J. BONSALE TAYLOR,  
WILLIAM H. HALL.