

(No Model.)

2 Sheets—Sheet 1.

H. EXLEY.

Machine for Cutting Leather, &c.

No. 239,475.

Patented March 29, 1881.

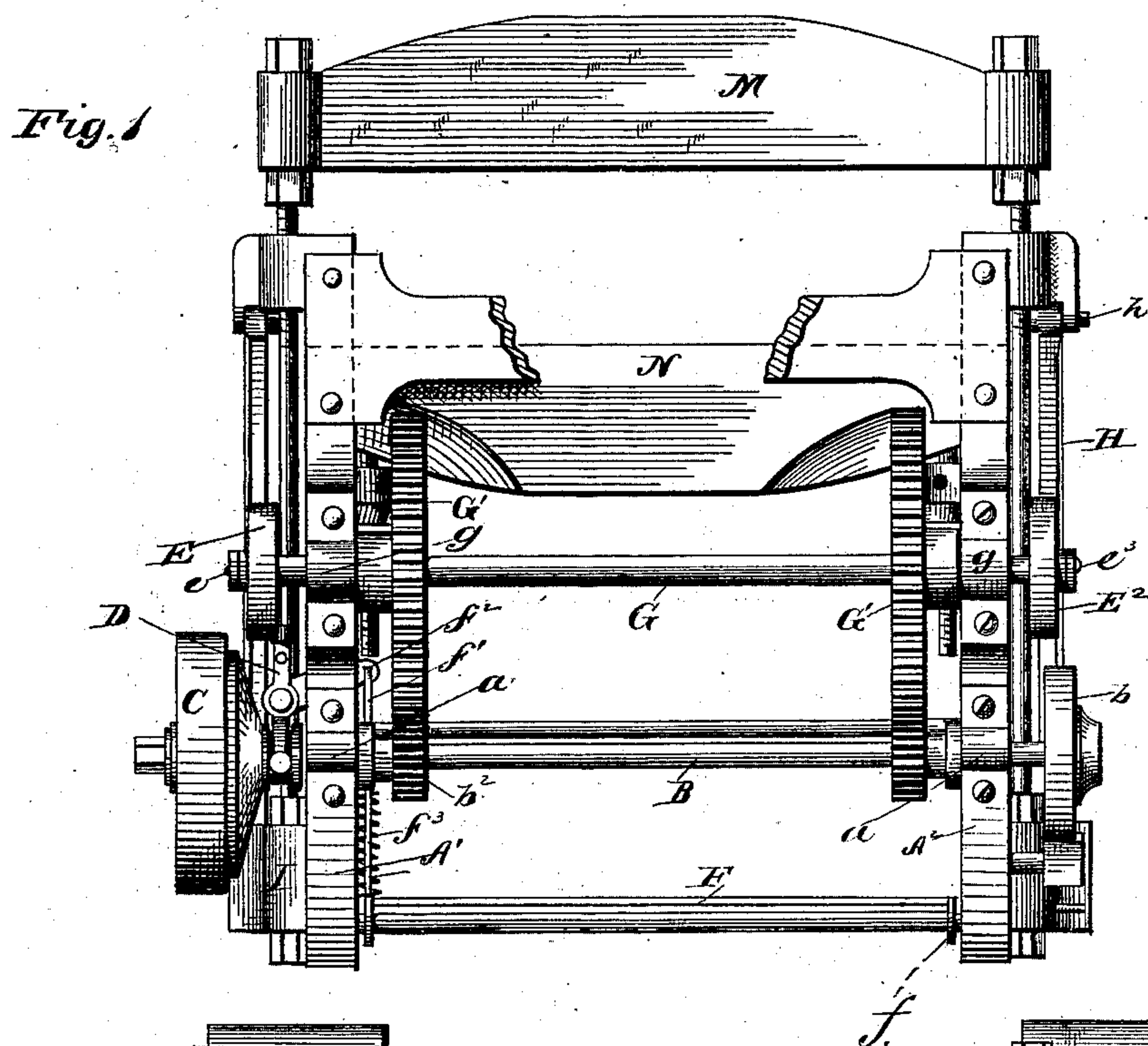
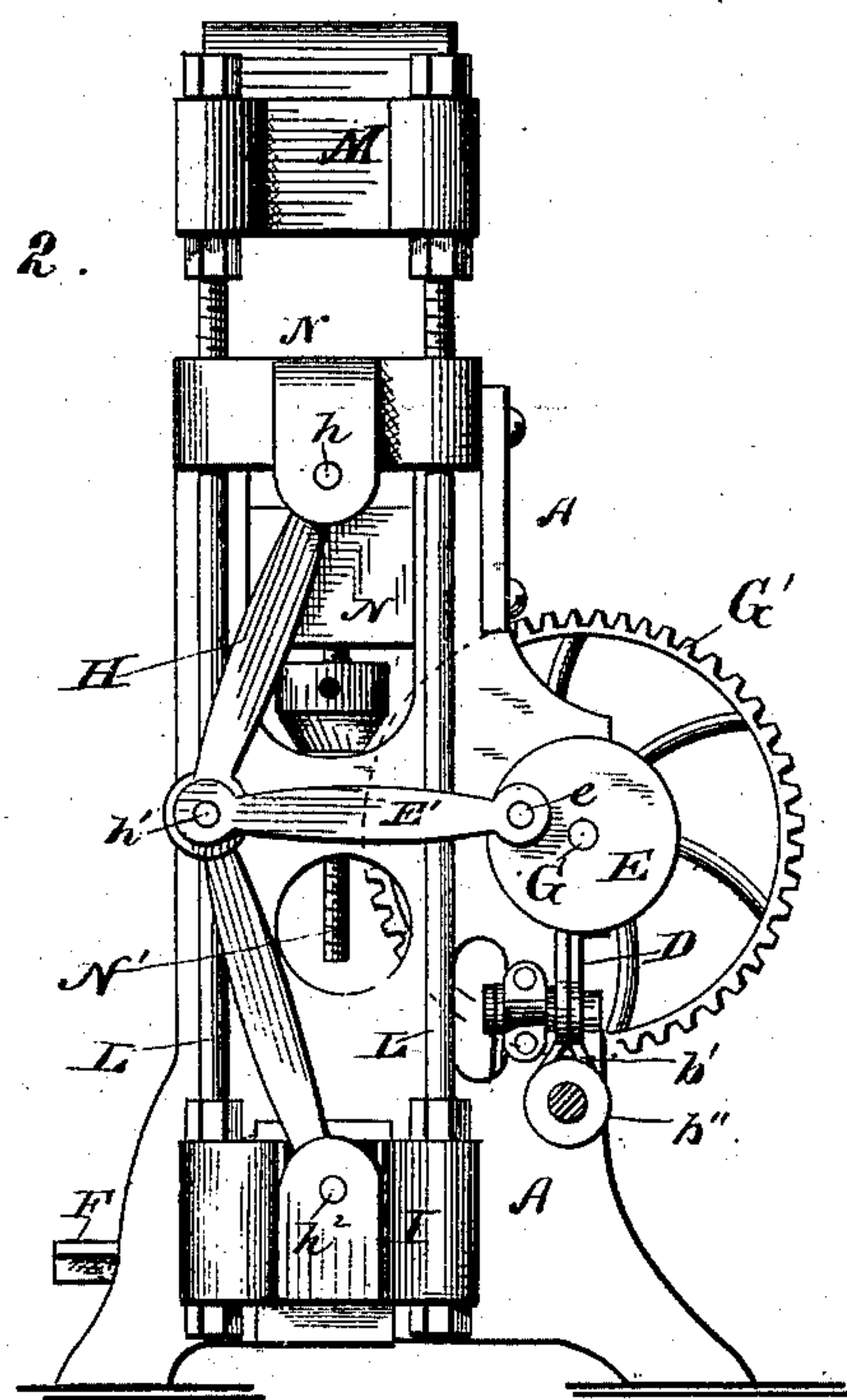
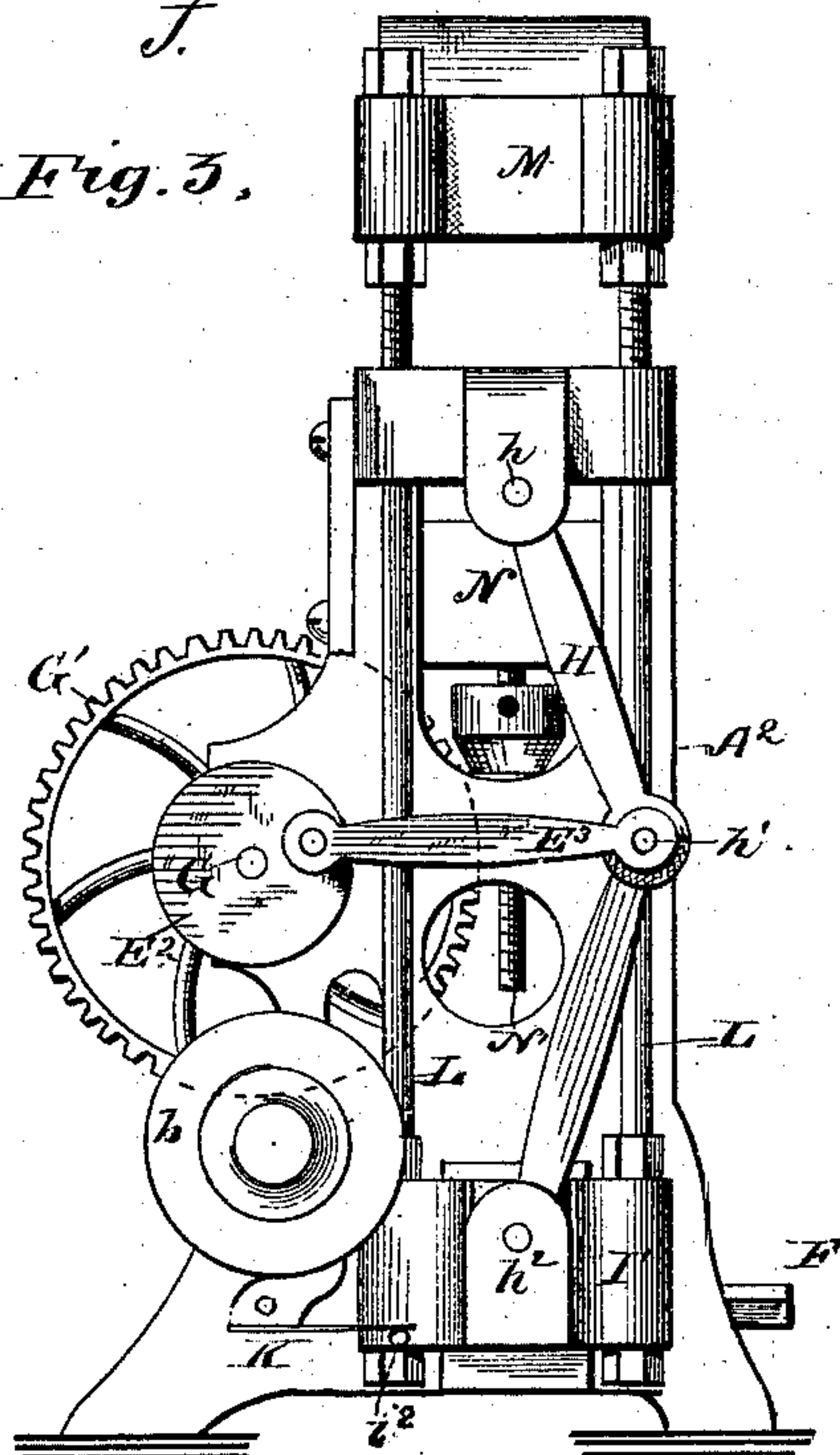


Fig. 2.



Attest
W. H. N. Knight
Joseph Forrester

Fig. 3.



Inventor,
Henry Esley,
by Edson Bros.
Atty's

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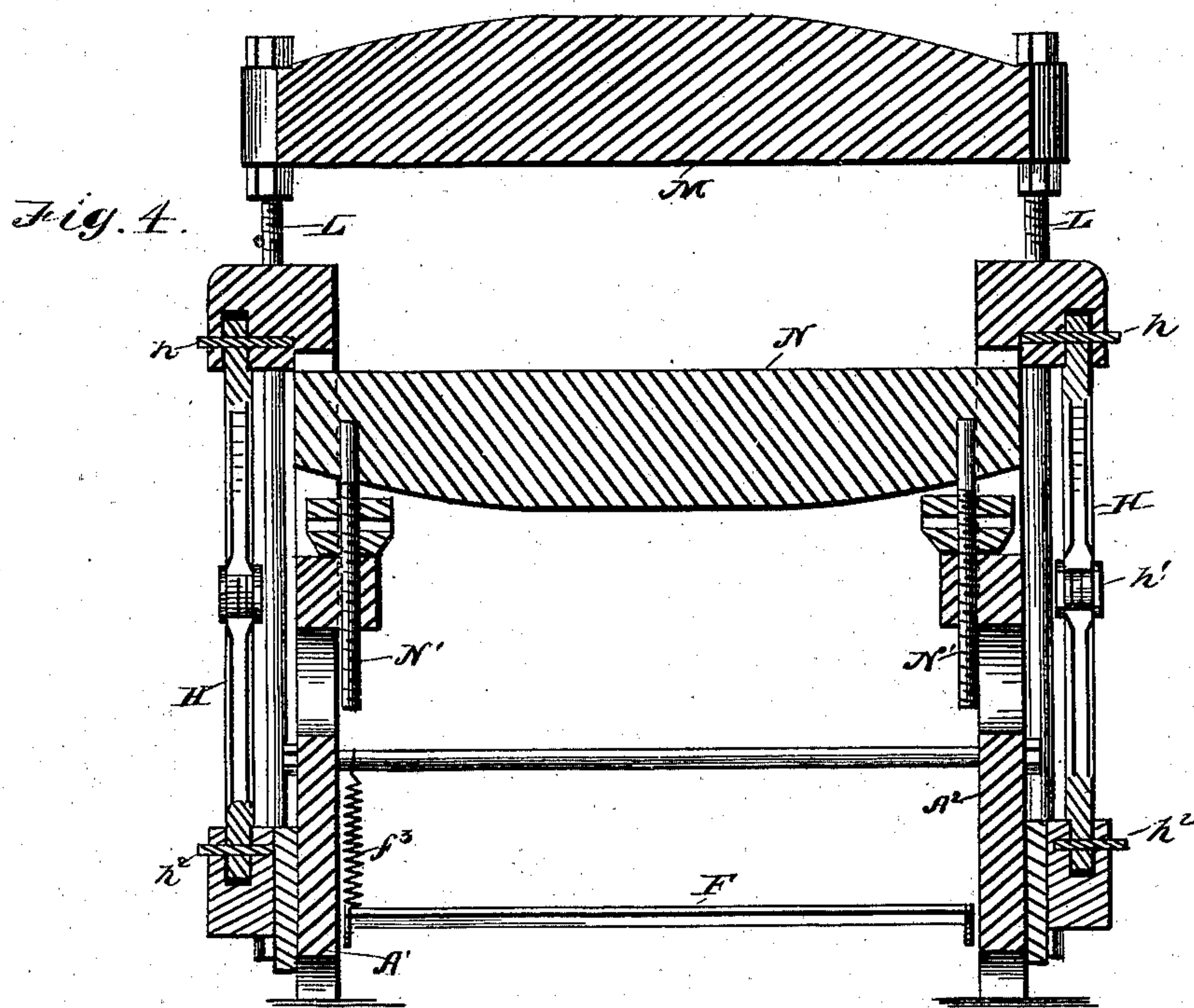


Fig. 5.

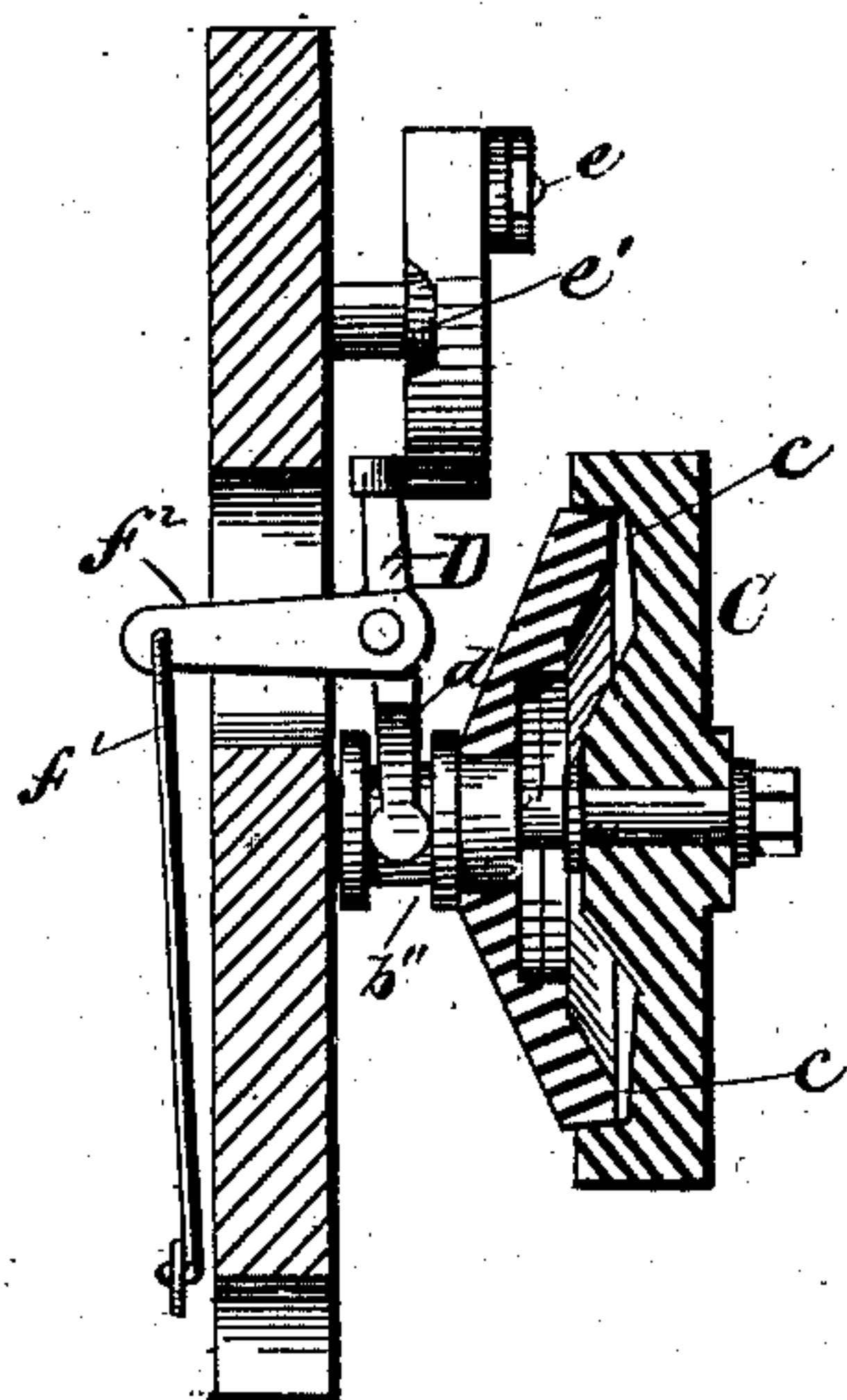


Fig. 6.

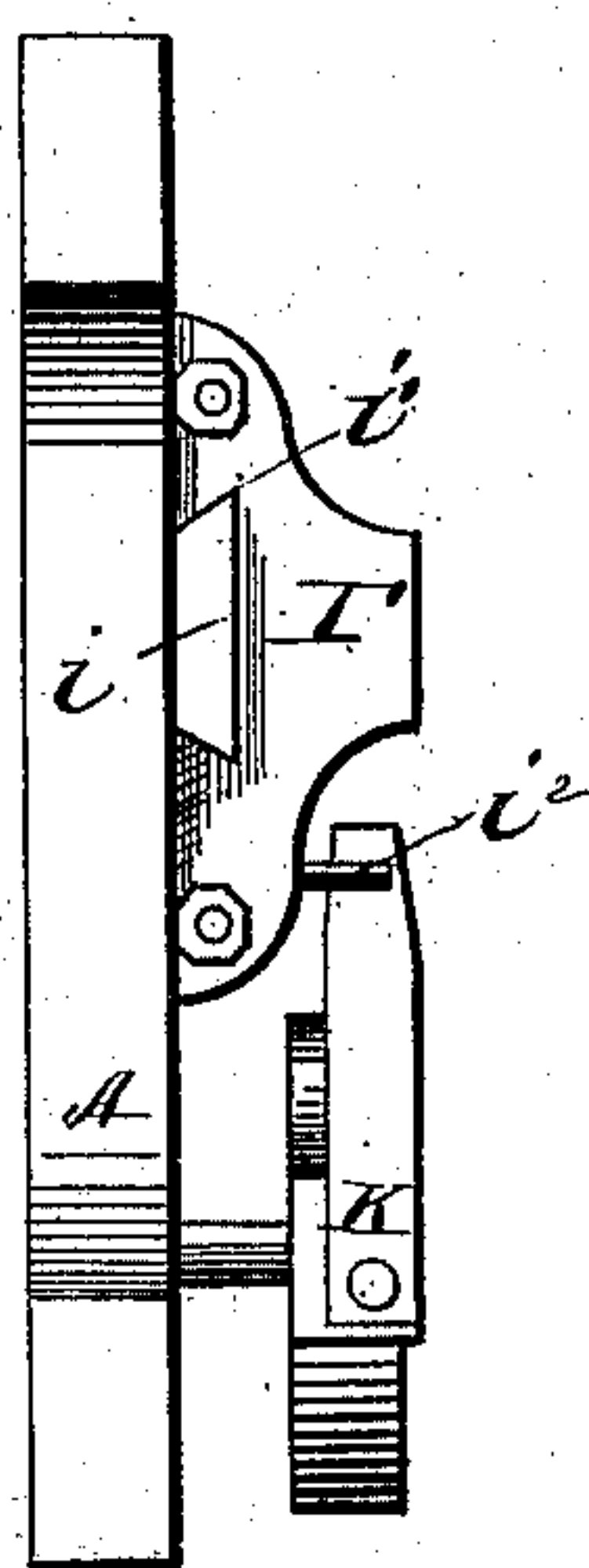
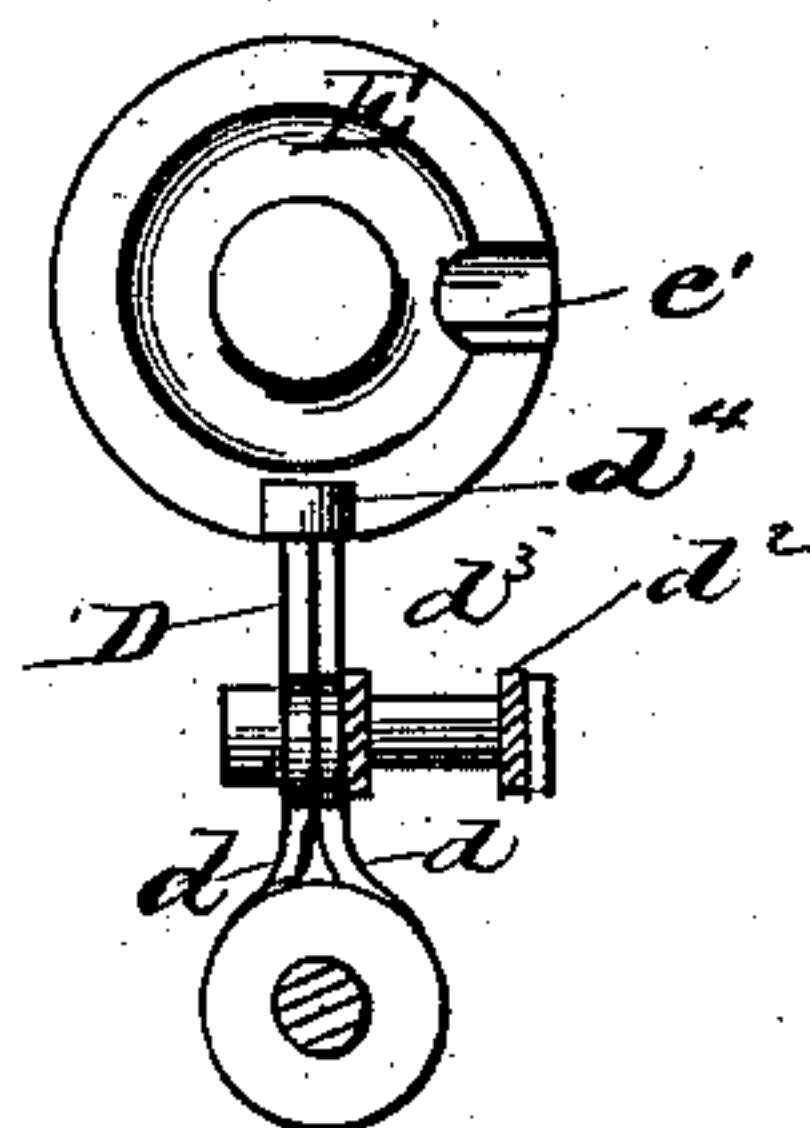


Fig. 7.



Attest.
Wm. H. Knight
Joseph Forrest

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UNITED STATES PATENT OFFICE.

HENRY EXLEY, OF MARLBOROUGH, MASSACHUSETTS.

MACHINE FOR CUTTING LEATHER, &c.

SPECIFICATION forming part of Letters Patent No. 239,475, dated March 29, 1881.

Application filed February 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY EXLEY, a citizen of the United States, residing at Marlborough, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Cutting Leather, Leather-Board, Cloth, Rubber, Paper, &c.; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to a machine for cutting leather forms for shoes or other purposes, where quantities of such forms are desired; and the novelty consists in the construction and arrangement of parts as will be more fully hereinafter set forth, and specifically pointed out in the claims.

The object of the invention is to operate a vertically-reciprocating platen by toggle-levers linked to an eccentric upon either end of the machine, said eccentrics being geared to a shaft revolved by a power-pulley having a friction-clutch which is thrown in and out of operation by mechanisms which serve, in connection with one of the eccentric-wheels and a treadle-lever, to automatically apply a friction-brake upon the operating-shaft, to overcome the momentum attained by the revolutions of the gears.

In carrying out the invention I employ a vertical frame consisting of two end standards properly braced, each end having a recess, in which operates a vertically-adjustable table or base, upon which the material to be cut is placed, and the adjustment is obtained by means of a screw-rod and windlass-disk.

Journaled in the standards is an operating-shaft carrying upon one end a rigid brake-wheel, upon the other extremity a friction-clutch and a loose pulley, for connection to the motor, by belts or otherwise, and between the standards with duplex pinions, which mesh with cog-wheels rigid upon a shaft above, also journaled in the standards of the frame. Upon each end of this latter shaft is rigidly secured a wheel having a pin eccentrically arranged, to which is loosely attached a link connecting with a toggle-lever. The upper levers are se-

cured firmly to the standards at the top, and are pivoted to the lower levers by the same bolt which secures them to the link which connects them to the eccentrics, and pivoted below to a frame having a dovetailed recess, which receives a correspondingly-formed projection upon the standards, upon which said frame reciprocates as in guides. To this frame, one upon each end, is secured a rod, which extends upward and is adjustably secured to a vertically-reciprocating platen. There being two rods to each frame, it will be understood that the four rods are secured to the platen, one at each corner, and as the reciprocation of the frames is forced by arbitrary gear, the consequent reciprocation of the platen is absolutely the same at all points. The platen performs one complete upward movement and return with each revolution of the eccentrics; and to provide that there shall be a pause at each time that the platen reaches its highest point, to allow the operator to remove the forms already cut and to supply other material at will, I provide means for releasing the power.

Pivoted to a cross-bar of the standards is a treadle, which connects by a link with an arm properly pivoted in the frame and carrying a rigid lever having upon one end a friction-roll, which operates to traverse the surface of one of the eccentric-wheels, to force the friction-clutch into operation with the power-pulley when the platen is making its downward and return movement, and which rests within a recess in the eccentric-wheel at each revolution thereof, to throw the friction-clutch out of operation. A spring upon the treadle forces the roll into the recess, which insures the disengagement of the clutch with the power-pulley, allowing the pulley to revolve idly while the platen is at rest.

To insure against the momentum of the revolving parts carrying the eccentrics past the disengaging-recess, I provide a pin, which projects from the reciprocating frame at the opposite end of the machine, which pin operates upon a spring-brake at each upward traverse of the platen, to force said brake against a brake-wheel upon the operating-shaft in such a manner and with such force as to overcome the momentum and insure the pause or rest of the platen, as described.

The cutting knives or dies are held by the

operator in proper position upon the material, and several patterns may be employed upon the same material at the same or at different actions of the platen, the operator changing the die at will.

The device is useful for cutting other material than leather--such as paper, cloth, rubber, &c.

The invention is fully illustrated in the accompanying drawings, in which Figure 1 is a rear elevation; Fig. 2, an end elevation with the power-pulley removed; Fig. 3, a view, in elevation, of the opposite end; Fig. 4, a longitudinal vertical section; and Figs. 5, 6, and 7, detail views.

Referring to the drawings, A represents the main frame, the important parts of which, in this description, are the ends or standards $A^1 A^2$, the former being the end to which the power is applied.

Journalled at a in the frame A is the operating-shaft B, having a rigid brake-wheel, b , at one extremity, a friction-clutch, b' , near the opposite end, and pinions b^2 at intervening points between the standards, all these features being rigid with the shaft B. The clutch b' operates within an annular recess, c , in a loose power-pulley, C, and within an annular recess, b'' , upon the shank of the clutch b' operate the duplex arms d of a clutch-lever, D, pivoted at d' to a bracket, d^2 , secured to the frame A^1 upon a shaft, d^3 , with which it is rigid. The upper end of the lever D is provided with a friction-roll, d^4 , which is adapted to operate in relation to a wheel, E, having a pin, e , arranged to give a crank motion to a pitman, E' , which connects with toggle-levers, as shown, and is provided upon its inner surface with a recess, e' , in which the roll d^4 rests when the clutch is disengaged. As the wheel E is revolved the roll d^4 rides up one side of the recess e' , the clutch having been thrown into engagement with the power-pulley by means of a treadle, F, pivoted at f , and connected to the shaft d^3 by a link, f' , and an arm, f^2 , a spring, f^3 , serving with a constant force to hold the roll d^4 against the crank-wheel E. This wheel E is hung rigidly upon a shaft, G, journalled in the frame A at g , and carrying upon its opposite end a similar crank-wheel, E^2 , having a similar pitman, E^3 , connecting the crank-pin with toggle-levers H, the connection being the same upon both ends. The toggle-levers H are pivoted above at h to the upper portion of the frame at h' together, and to the pitmen E' E^3 , and below at h^2 to vertically-reciprocating frames I I', each having a dovetailed recess, i , which receives a correspondingly-formed projection, i' , upon the outer surface of the frame A, the frame I' being located upon the standard A^2 , and having a pin, i^2 , which, upon the upward motion of the frame, throws a spring-brake, K, into operation with the brake-wheel b .

Secured to each of the frames I I' are two vertical rods, L, which are adjustably secured above to the four corners of a platen, M. The

shaft G carries cog-wheels G' , which mesh with the pinions b^2 upon the operating-shaft B and serve to transmit motion to the platen M.

N represents the table or base upon which the material is placed to be cut, and it is vertically adjustable by means of screw-rods N' , which operate in threaded projections upon the standards $A^1 A^2$.

It will be observed, first, that the treadle is only employed for an instant, or only long enough to throw the clutch in operation; second, that the clutch is thereafter held in operation by the roll d^4 acting upon the wheel E until the roll is forced in the recess e' by the action of the spring f^3 ; third, that the momentum is overcome by the action of the automatic spring-brake K; fourth, that the toggle-levers are operated by arbitrary mechanisms, and that they exert a maximum of force with a minimum of power during the cutting process; fifth, that the table is adjustable to suit quantities and qualities of material at will; sixth, that the platen is removable and adjustable; seventh, that the operating mechanism stops automatically at each complete operation at the desired point for changing material; eighth, that the complete operation is automatic, except the voluntary act of the operator upon the treadle to throw the clutch in operation.

What I claim as new is—

1. In a leather-cutting machine, the combination of a pulley, a friction-clutch, and a clutch-shifting lever with a crank-wheel having a recess, a roll upon the lever, a treadle, a spring, and suitable connecting mechanisms, as set forth, for the purpose specified.

2. The combination of the pulley, the clutch, the recessed crank-wheel, and spring-treadle with the brake-wheel, spring-brake, and means for automatically operating the same, as specified.

3. The frame A, having dovetailed projections i' , in combination with the reciprocating frames I I', having dovetailed recesses i , the rods L, platen M, toggle-levers H, and operating mechanism.

4. The frames I I', toggle-levers H, platen M, and adjusting-rods L, combined with the pitmen E' E^3 , crank-wheels E E^2 , and means for automatically stopping the operating mechanisms at the last of each complete reciprocation of the platen, as specified.

5. The power-pulley C, friction-clutch b' , and lever D, having friction-roll d^4 , combined with crank-wheel E e , having recess e' , treadle F, spring f^3 , link f' , and arm f^2 , as specified.

6. The frame I', having pin i^2 , in combination with the spring-brake K, brake-wheel b , shaft B, clutch and lever, crank-wheel E e' , spring f^3 , and operating and connecting mechanism, as specified.

7. The treadle F f , spring f^3 , link f' , and arm f^2 , combined with the rock-shaft d^3 , clutch-lever D, roll d^4 , and crank-wheel E $e e'$, as and for the purposes set forth.

8. The standards $A^1 A^2$, having recesses, as

shown, combined with the vertically-adjustable table N and screw-rods N', and with an adjustable reciprocating platen, M, as and for the purposes set forth.

5 9. The shaft B, brake-wheel *b*, spring-brake K, frames I I', the latter having pin *i*², pinions *b*², pulley C *c*, and clutch *b*', combined with the shaft G, gears G', crank-wheels E E², pitmen E' E³, toggles H, platen M, rods L, and

treadle E, with its connections, as and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY EXLEY.

Witnesses:

A. A. KENRICK,
JOHN S. FAY.