

(No Model.)

3 Sheets—Sheet 1.

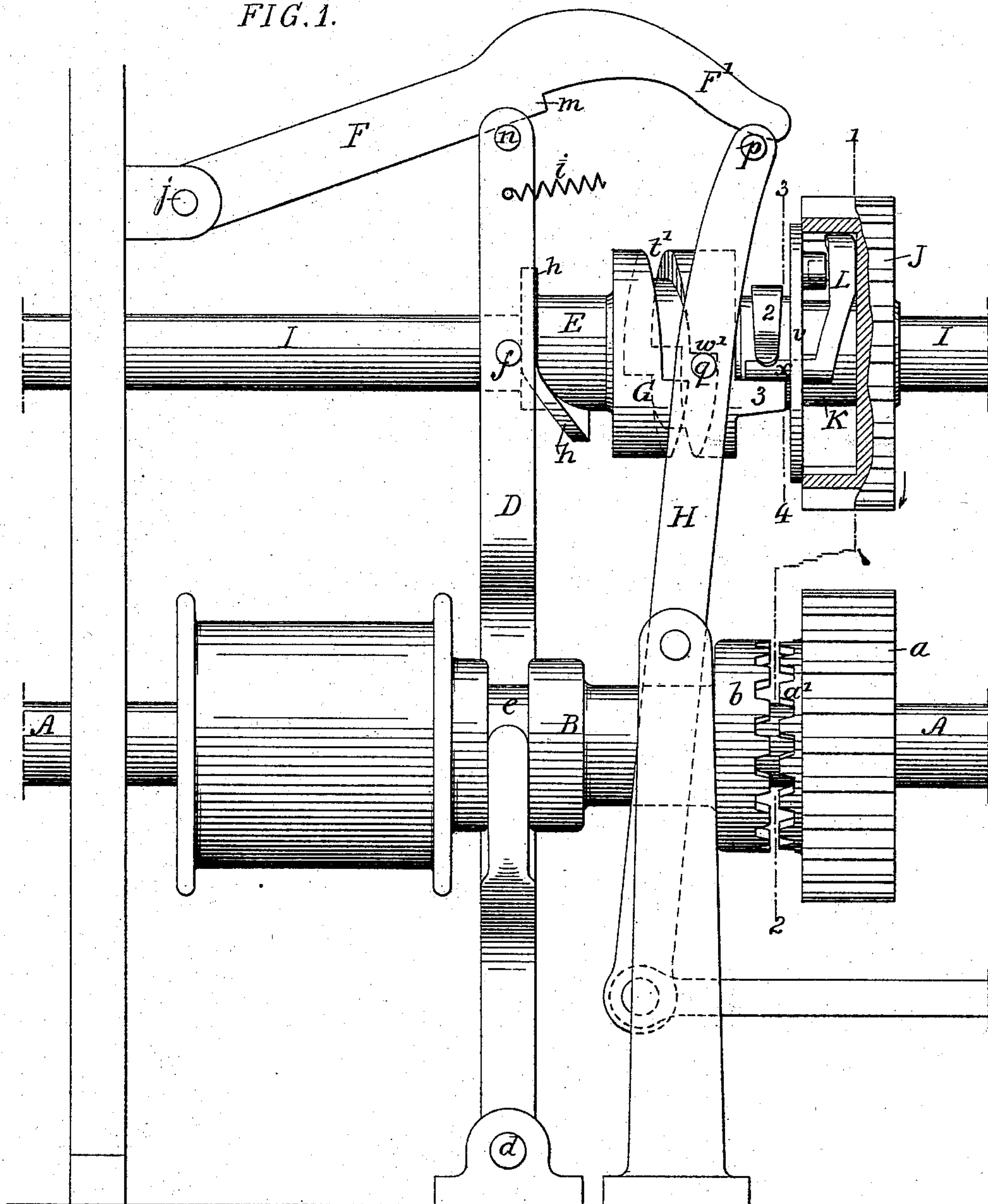
H. L. MOULTON.

CLUTCHING, UNCLUTCHING AND LOCKING GEAR.

No. 270,096.

Patented Jan. 2, 1883.

FIG. 1.



WITNESSES:

Alexander Barkoff

James F. Tobin

INVENTOR:

Hamilton L. Moulton
by his Attorneys
Howe and Frost

(No Model.)

3 Sheets—Sheet 2.

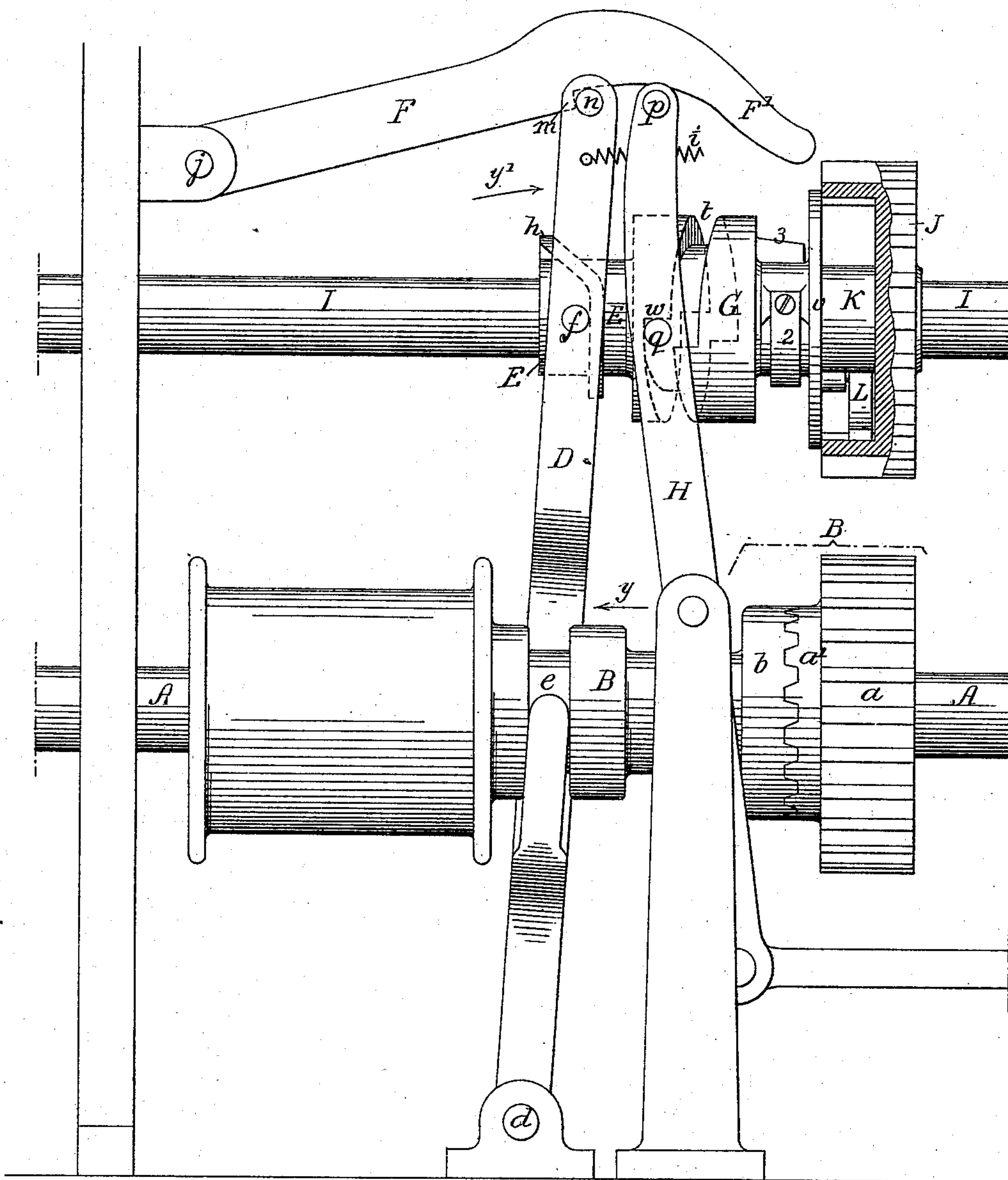
H. L. MOULTON.

CLUTCHING, UNCLUTCHING AND LOCKING GEAR.

No. 270,096.

Patented Jan. 2, 1883.

FIG. 2:



WITNESSES:

Alexander Barkoff
James F. Tobins

INVENTOR:

Hamilton L. Moulton
by his Attorneys
Howe and Jones

(No Model.)

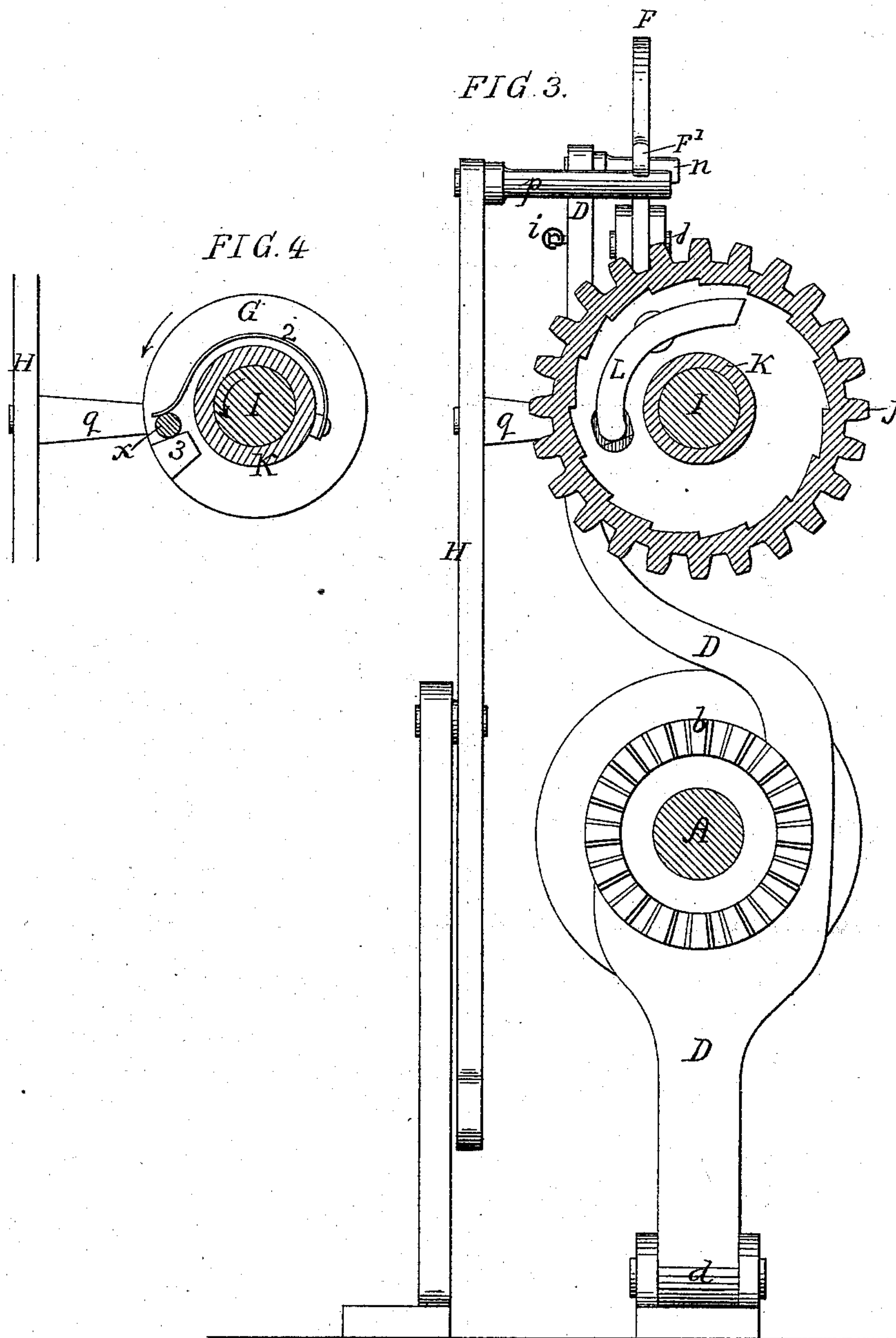
3 Sheets—Sheet 3.

H. L. MOULTON.

CLUTCHING, UNCLUTCHING AND LOCKING GEAR.

No. 270,096.

Patented Jan. 2, 1883.



WITNESSES:

Alexander Barkoff
James F. Coburn

INVENTOR:

Hamilton L. Moulton
by his Attorneys
Howe and May

UNITED STATES PATENT OFFICE.

HAMILTON L. MOULTON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE JAMES SMITH WOOLEN MACHINERY COMPANY, OF SAME PLACE.

CLUTCHING, UNCLUTCHING, AND LOCKING GEAR.

SPECIFICATION forming part of Letters Patent No. 270,096, dated January 2, 1883.

Application filed November 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, HAMILTON L. MOULTON, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented an Improved Clutching, Unclutching, and Locking Gear, of which the following is a specification.

My invention relates to mechanism of which a clutch or clutches form part; and my main object is to cause a power-driven machine to automatically perform the duty of clutching and unclutching in obedience to mechanism which may be operated by a slight effort, either by hand or automatically.

A further object of my invention is to insure a determinate automatic clutching or unclutching and the locking of the clutch in either of the positions to which it may be moved.

In the accompanying drawings, Figure 1, Sheet 1, is an elevation partly in section of the clutching and releasing mechanism; Fig. 2, Sheet 2, the same as Fig. 1, but showing the operating parts in a different position; Fig. 3, Sheet 3, a vertical section on the line 1 2, Fig. 1; and Fig. 4, a vertical section on the line 3 4.

A is a continuously-rotated shaft, and B a clutch, one part, *a'*, of which is, in the present instance, on a cog-wheel, *a*, secured to the said shaft, the other part, *b*, of the clutch being on a sleeve, B, which fits snugly on the said shaft A, and which has to be clutched thereto or released therefrom by mechanism which forms the subject of my invention, power being transmitted from this sleeve when it is clutched. The sleeve, for instance, may form part of a hoisting or hauling barrel. The sleeve may be arranged to slide on but turn with the shaft, and the object to which the sleeve has to be clutched may be loose on the shaft.

D is the clutch-lever, pivoted at its lower end, *d*, in any suitable manner, to the frame of the machine to which the device may be applied, this lever being so adapted to a groove, *e*, in the sleeve that the latter must slide to and fro on the shaft A as the said lever is vibrated. The clutch-lever is provided with a pin, *f*, which is caused to bear against the scroll-flange *h* of a cam, E, by a spring, *i*, which connects the lever to any fixed part of the

frame, the cam, which is fast on a shaft, I, tending to move the sleeve B in the direction of the arrow *y* when the said shaft is turned, and to unclutch it from the shaft A, and the spring tending to move the sleeve in a contrary direction and to clutch it to the shaft.

A locking-arm, F, is pivoted at *j* to the frame of the machine, and this arm has a shoulder, *m*, against which, when the said arm is depressed, bears a pin, *n*, on the clutch-lever D, which thus prevents the unclutching of the sleeve B from the shaft A until the time comes for the cam E to perform the unclutching duty.

A lever, H, is pivoted to the frame of the machine, and has at its upper end a pin, *p*, on which bears the inclined portion F' of the locking arm F. This lever H may be operated, by hand or automatically, from any working part of the machine. The lever F has another pin, *q*, which projects into and is adapted to the grooves *t t'* of the cam G, which is loose on the shaft I, but turns therewith under the circumstances explained hereinafter. The two grooves *t t'* are so formed and arranged on the cam G that when the pin *q* is in one groove it, together with the lever H, will be moved in one direction when the cam turns, and when the pin is in the other groove the lever will be moved in a contrary direction without changing the direction in which the cam is turned. The two grooves have abrupt communications with each other, so as to form two shoulders, one shoulder, *w*, on one side of the cam and the shoulder *w'* on the opposite side of the cam.

A power-driven wheel or pulley, J, is loose on the shaft I, and this wheel is recessed on one side, and has internal ratchet-teeth, as shown in Fig. 3. A lever, L, pivoted to a collar, K, secured to the shaft, has a short arm, forming a pawl adapted to the internal ratchet-teeth of the wheel J, the long arm being provided with a pin, *x*, which projects through an elongated opening in the flange *v* of the said collar K. A spring, 2, is secured at one end to this collar, passes partly round the same, and bears near its outer end against the projecting pin *x* of the pawl-lever, the tendency of the spring being to maintain the pawl in gear with the ratchet-teeth of the wheel.

There is a projection, 3, on the cam G, and with this projection the pin x of the pawl comes in contact under the circumstances explained hereinafter; but when thus brought into contact the pin x will yield to an extent limited by the elongated opening in the flange of the collar, and this yielding of the said pin x is sufficient to cause the pawl to be disengaged from the ratchet-teeth of the wheel J. Supposing the parts to be in the position Fig. 1, the sleeve B being unclutched from the wheel a , which continues to revolve with the shaft A, while the sleeve is free from the control of the said shaft. The shoulder w' of the scroll-cam G has been brought into contact with the pin q of the lever H, and the pawl has been thrown out of gear with the ratchet-teeth of the wheel J, owing to the pin x of the pawl-lever being in contact with the projection 3 of the cam G, while the latter has been arrested by the pin q . The locking-lever has been raised by the pin p of the lever H, and the spiral flange h of the cam E, acting on the pin f of the clutch-lever, has so moved the latter that the sleeve B is unclutched from the wheel a , as stated above. While the several parts are in these positions the shaft I, cams E and G, and collar K are stationary, while the wheel J continues to revolve in the direction of the arrow, the clutch meanwhile being locked in its position, for the bearing of the pin f of the clutch-lever against the flange h of the cam E, caused by the spring i , prevents any such movement of the clutch-lever as to cause the clutching of the sleeve B to the wheel a . As long as the moving parts are in this position, Fig. 1, the sleeve is free from the control of the shaft A. By so moving the lever H that its pin q will leave the shoulder w' , Fig. 1, and coincide with the spiral groove t' , the following movements will take place: The cam G ceasing to be retained by the pin q , the spring 2, which has been under tension, will yield, and so act on the pawl-lever as to throw the pawl into gear with the ratchet-teeth on the wheel J, when the cam G must, through the medium of the pawl, ratchet, and collar, turn with the shaft, and the cam E must also turn with the said shaft. The pin q of the lever H will now be under the influence of the spiral groove t' of the cam G, and this groove is such that it will move the lever H to the position shown in Fig. 2, during which movement the cam E, turning with the shaft, permits the spring i to draw the clutch-lever D in the direction of the arrow y' , and to clutch the sleeve B to the shaft A, the pin p of the lever E having permitted the locking-lever F to fall and retain the levers, and consequently hold the sleeve B in its clutched condition. When the cam is arrested by its shoulder w coming into contact with the pin q the pawl is thrown out of gear with the ratchet-teeth of the wheel J, and the rotation of the shaft I, the collar K, and both cams will cease, and the several parts will remain in this condition until the lever H is so moved that its pin will coincide with the spiral

groove t of the cam G, when the sleeve will be unclutched from the wheel a on the shaft, and the several parts will again assume the positions shown in Fig. 1.

It will be noticed that the cam G is permitted to have a slight movement on the shaft independently of the collar, this independent movement being sufficient to permit the proper action of the pawl-lever.

The clutching and unclutching of the sleeve, it will be observed, is effected by the power-driven wheel J, through the intervention of mechanism described, and in obedience to the movement of the pin q , which may be effected by hand, but which, in most cases, will be actuated automatically from some working part of the machine to which the invention is applied, the power to unclutch being positive and direct, while the clutching, which requires a less effort, is effected by a spring controlled by the cam E. There can be no unclutching of the sleeve until the locking-lever is elevated, and there can be no unclutching until the turning of the cam E, with the shaft I, permits the spring i to perform this duty, and neither clutching nor unclutching can be effected without first operating the pin q . It is not essential that this pin should be attached to a lever. It may, for instance, be connected to a sliding bar operated to the limited extent necessary, a very slight effort being required to move the pin, as it is merely the indirect means of inducing power-driven mechanism to clutch and unclutch the sleeve.

The invention may be applied to many different kinds of machines. The sleeve B may, for instance, be attached to or form a part of a hoisting-barrel, the pin being automatically operated when the load has reached the desired height; or the device may be used in connection with the well-known duplex clutch and reversing-gear. There may be more than two spiral grooves and more than two shoulders on the cam G. I have, for instance, used a cam with four shoulders in connection with machinery for drawing in and moving out the carriage of a self-acting mule, the mode of operation being the same as that described above—that is, the causing of a power-driven wheel, through intervening mechanism, to do the work of clutching and unclutching in obedience to the movement of a pin, q , which is brought under the influence of different grooves in a cam.

The precise arrangement and construction of parts described above need not be adhered to. Indeed, different applications of the invention may demand different disposals and arrangements of parts.

I claim as my invention—

1. The combination, in clutching-gear, of the following elements—namely: first, a clutch and clutch-operating lever; second, devices for locking and unlocking the said lever, and for operating the same when unlocked; third, a cam having two or more grooves communi-

cating with each other for operating the locking and unlocking devices; and, fourth, mechanism whereby the said cam and its two grooves and the device for clutching and un-

5 clutching are brought into action when the locking and unlocking device is transferred from the control of one groove of the cam to another groove of the same, all substantially as set forth.

10 2. The combination of the clutch and clutch-lever and the locking-lever F and its inclined extension F' with the pivoted lever H and its pin p, substantially as specified.

15 3. The combination of the clutch and clutch-lever, the locking-lever F, and the pivoted lever H, with a shaft, I, having one cam, E, for operating the clutch-lever, and another cam,

G, for operating the locking-lever, substantially as described.

4. The combination of a shaft, I, a collar, 20 K, secured thereto, a power-driven wheel or pulley, J, on the said shaft, and the spring pawl-lever L, with the cam G, having a projection, 3, grooves, and abrupt shoulders where the grooves communicate, and with a movable 25 pin, q, all substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

HAMILTON L. MOULTON.

Witnesses:

HARRY DRURY,
HARRY SMITH.