

(No Model.)

2 Sheets—Sheet 1.

I. F. BROWN.
HAT FORMING MACHINE.

No. 323,023.

Patented July 28, 1885.

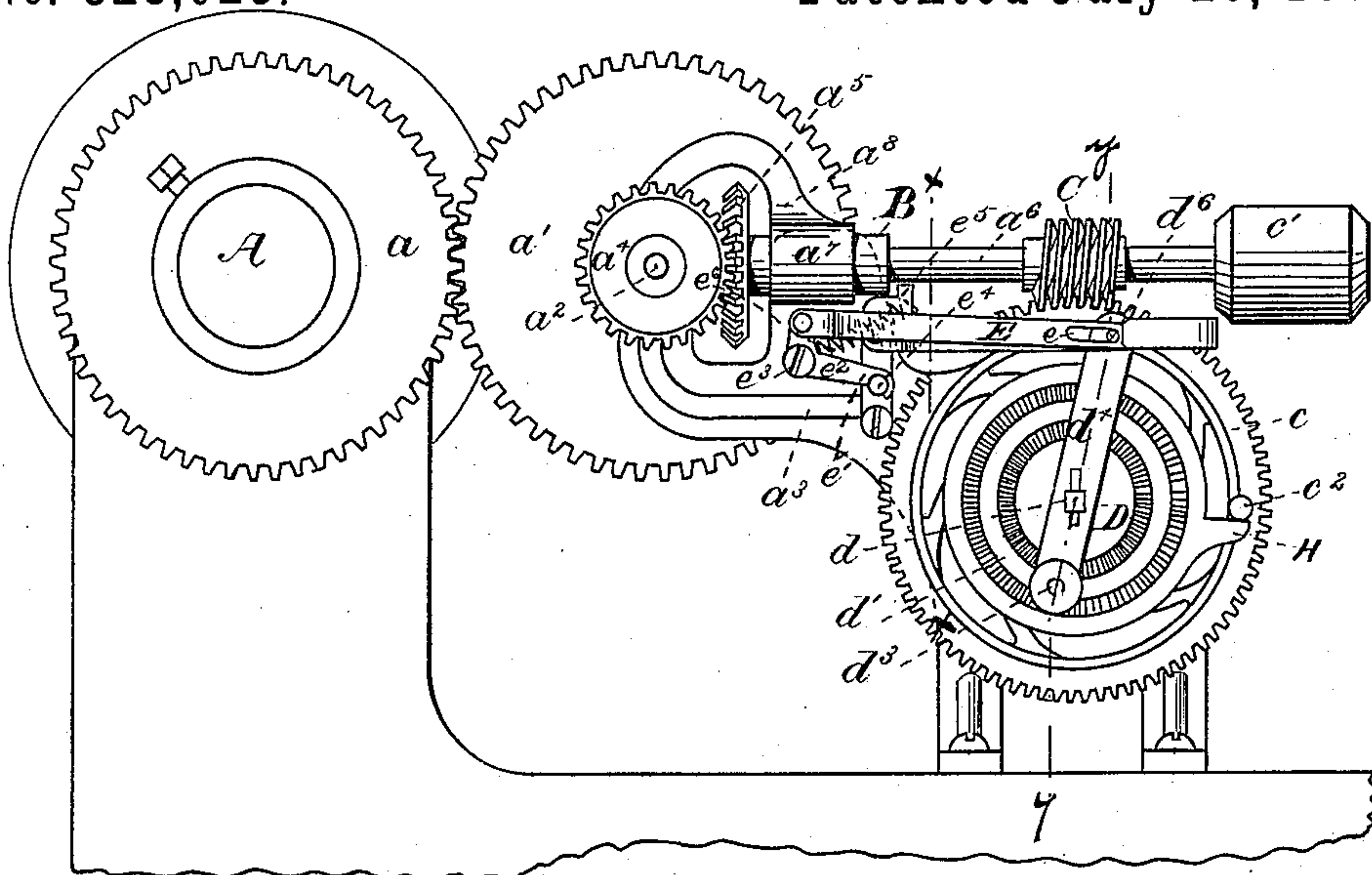


Fig. 1.

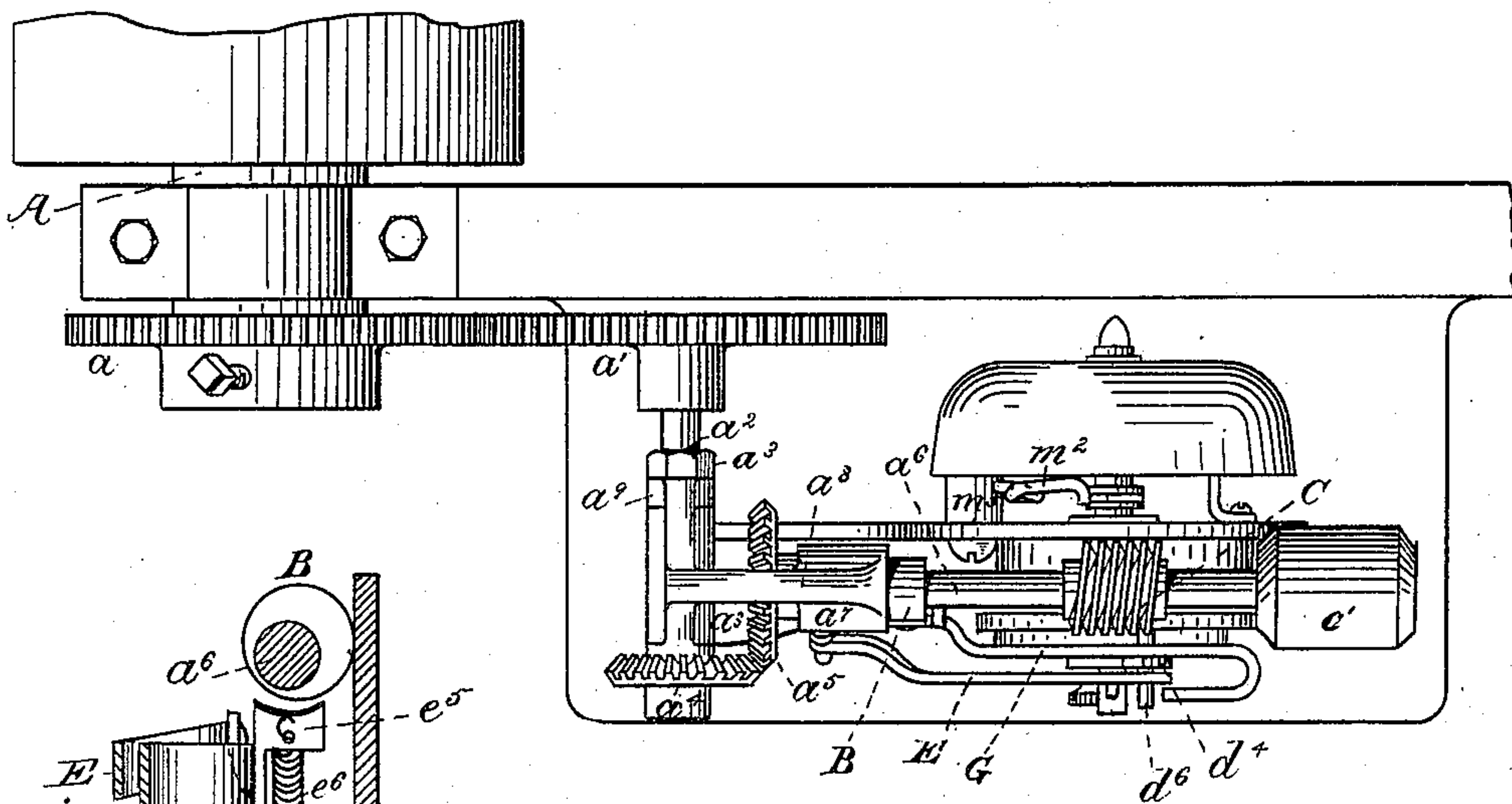


Fig. 2.

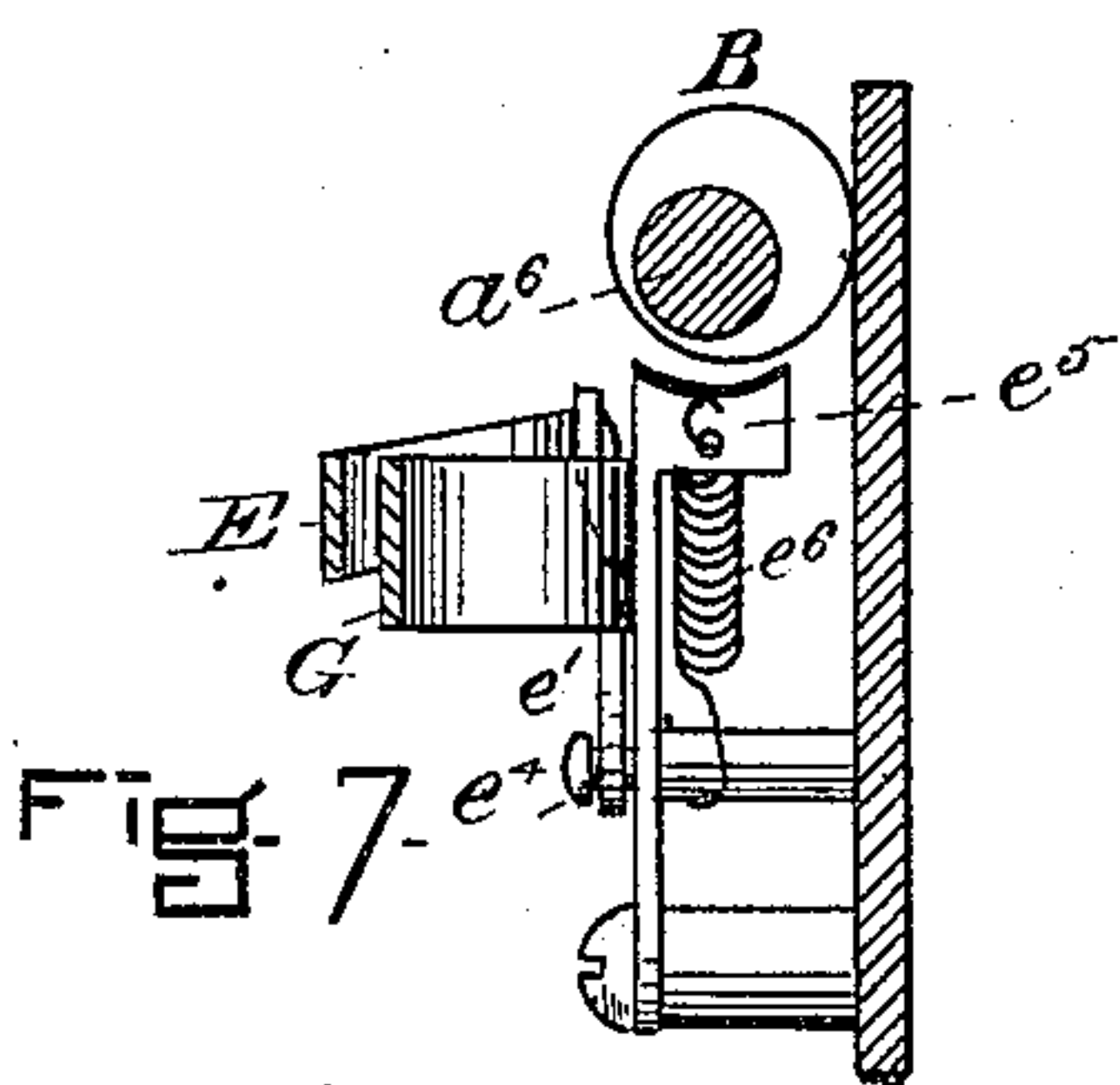


Fig. 7.

WITNESSES.

J. M. Dolan.
Fred. B. Dolan.

INVENTOR.

Isaac F. Brown
by his attys.
Clarke & Raymond.

(No Model.)

2 Sheets—Sheet 2.

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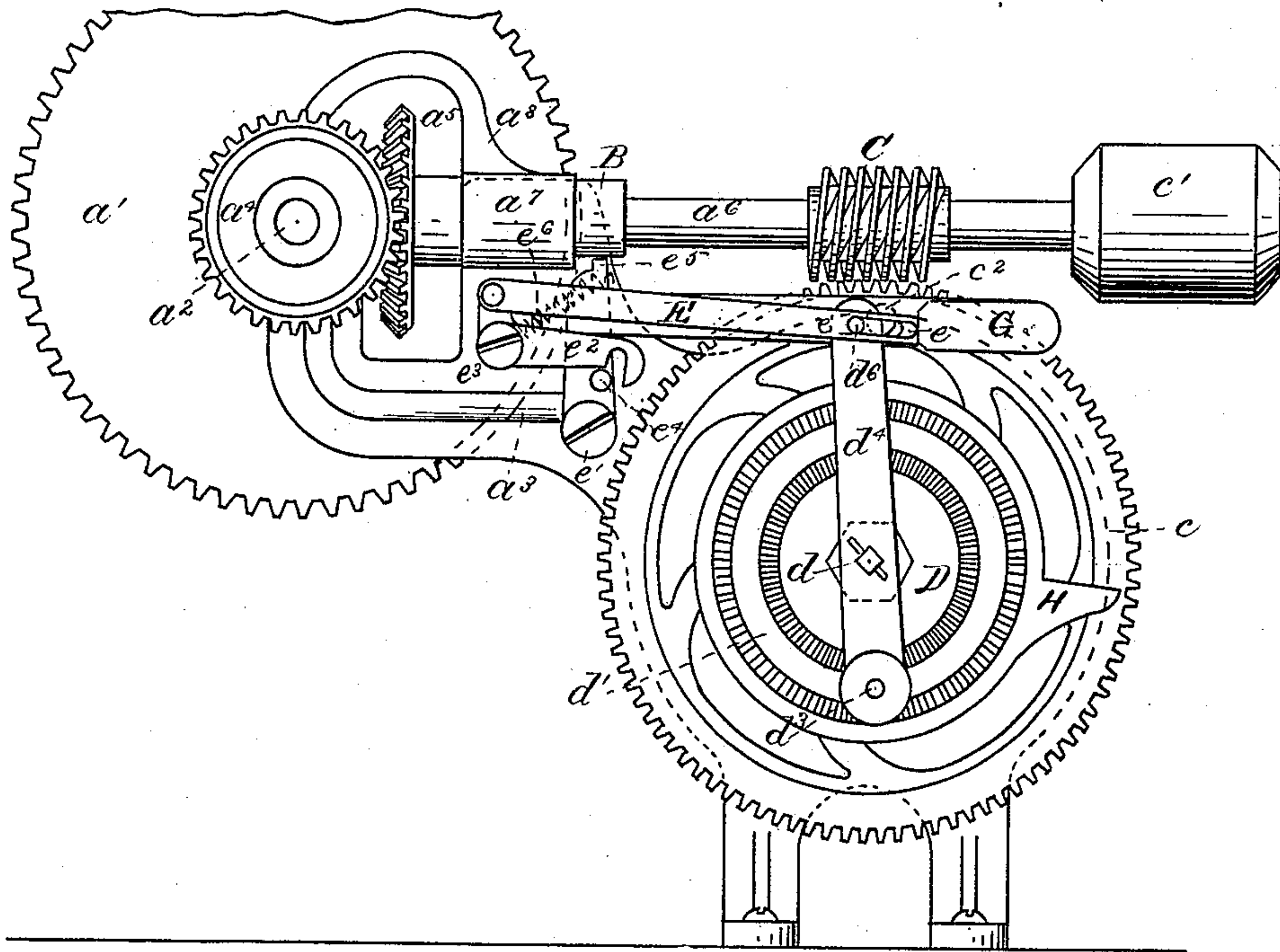


FIG. 3.

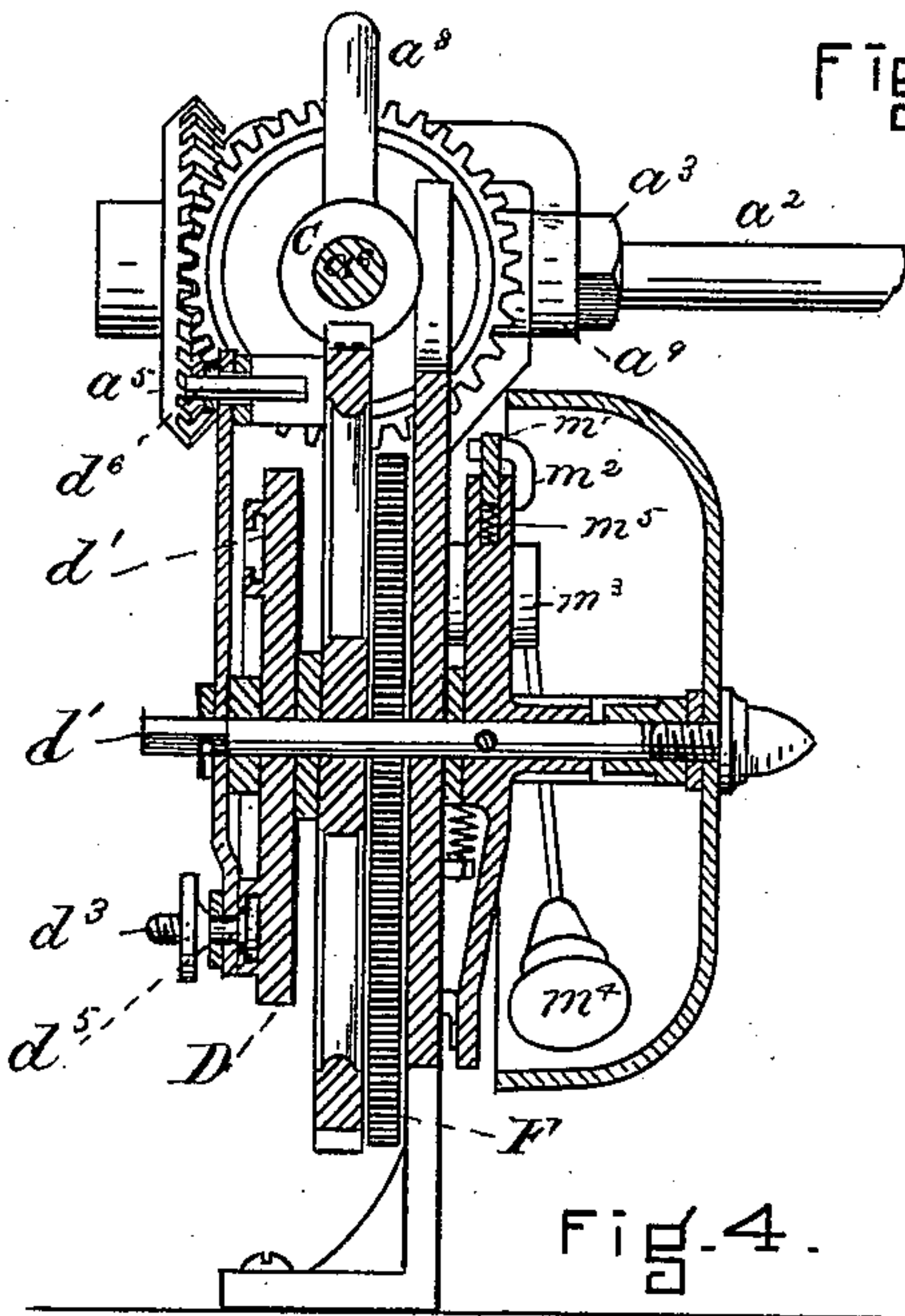


Fig. 4.

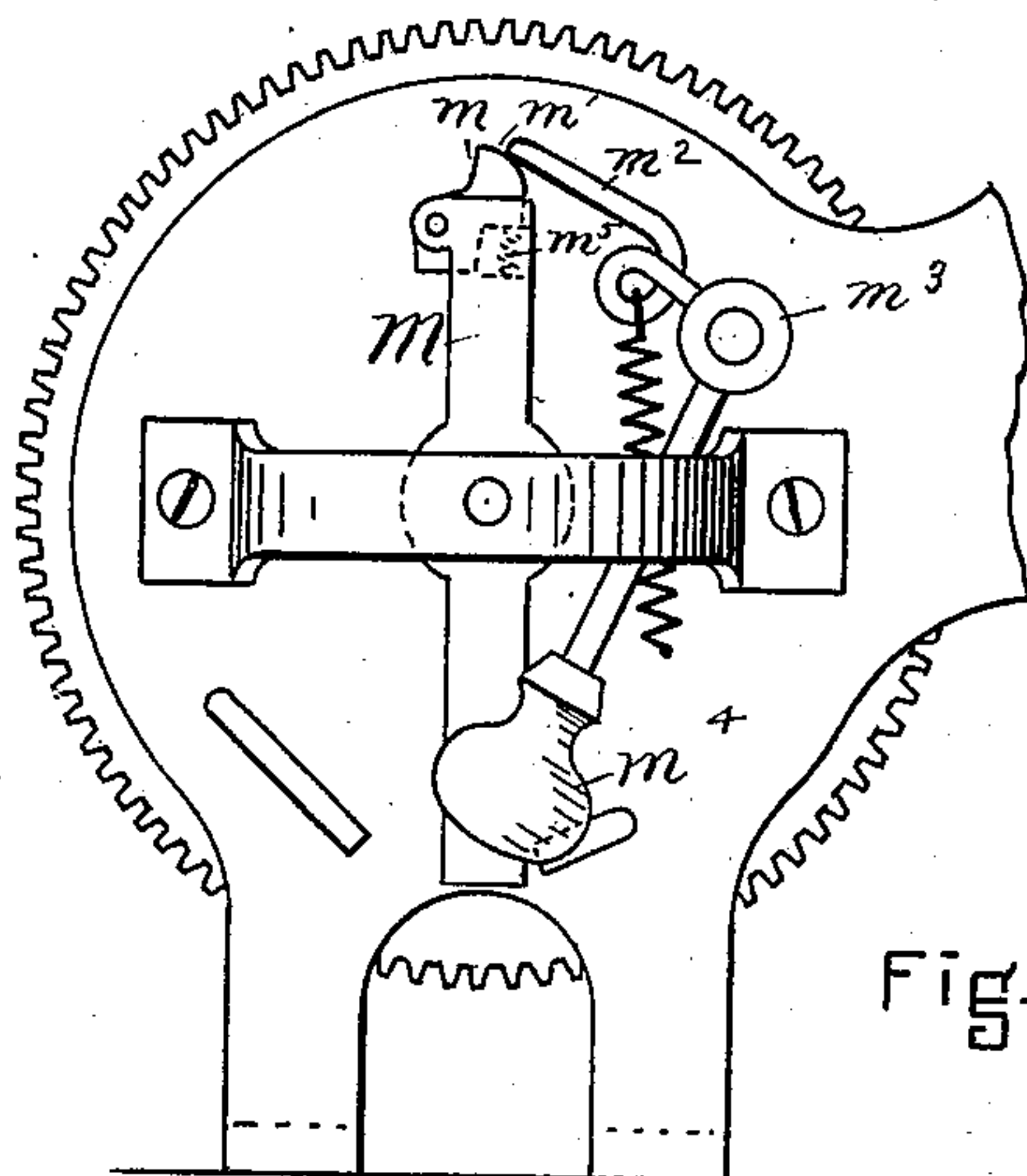


Fig. 5.

WITNESSES

J. M. Dolan.
Fred. B. Dolan.

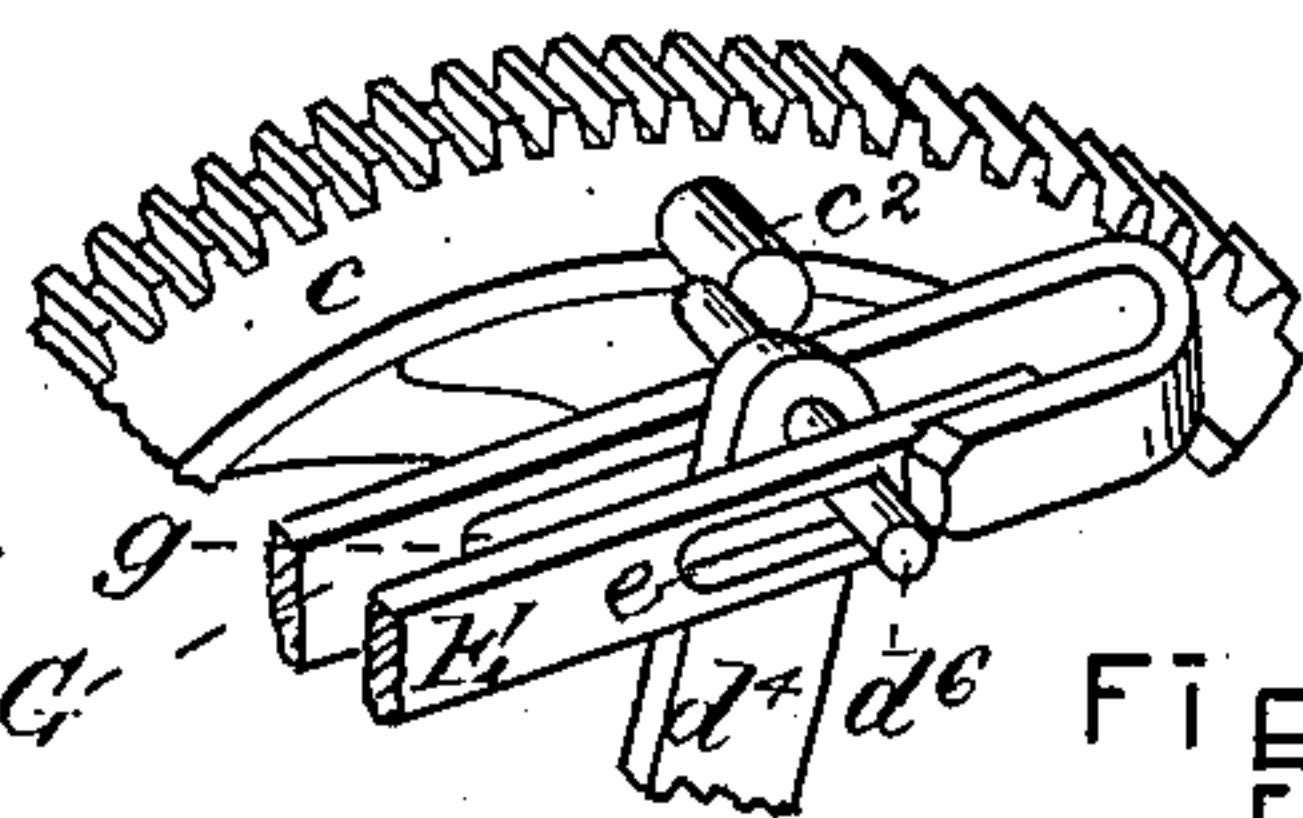


Fig. 6.

INVENTOR

Isaac F. Brown
by his atty
Charles T. Raymond

UNITED STATES PATENT OFFICE.

ISAAC F. BROWN, OF HYDE PARK, MASSACHUSETTS.

HAT-FORMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 323,023, dated July 28, 1885.

Application filed February 17, 1885. (No model.)

To all whom it may concern:

Be it known that I, ISAAC F. BROWN, of Hyde Park, in the county of Norfolk and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Hat-Forming Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification in explaining its nature.

Heretofore it has been customary, in operating hat-forming machines, to first weigh the wool which forms the bat, and then to feed it to the carding-machine, which forms it into a bat and delivers it to the hat-forming cone; and as the wool used is weighed before it is put into the carding-machine, and as it is necessary to deliver each quantity thus weighed to the receiving-cone, and as the operator who is attending the delivery of the bat upon the cone cannot know that the bat is ready for delivery until informed by the operator who weighs the bat and feeds it to the carding-machine, it follows that there is a considerable loss of time in the operation which might be saved if the operation of the carding-machine were to some extent continuous, if there were no necessity for first weighing the wool, and if notice were given when a proper supply or quantity of the bat had been fed to the cone; and my invention relates especially to a device whereby this improvement in the operation of the machine is produced, namely, whereby the wool may be fed to the carding-machine without being weighed, and when a sufficient quantity has been fed to the cone shall indicate that such quantity has been fed, so that the operator of the cone may know that a sufficient quantity has been fed to the cone and may cut the bat.

The improvement consists, especially, of a device adapted to be operated by the doffer-shaft or some other revolving part of the carding-machine, and to indicate when a predetermined quantity or amount of bat has been formed and fed, and as the bat is formed regularly and uniformly, so that a certain area of it will weigh so much, the necessity of previous weighing, if the extent and area which has been fed is known, becomes unnecessary, and the wool can be fed continuously, so that substantially a continuous bat can be formed.

Referring to the drawings, Figure 1 is a front elevation of a machine containing the features of my invention. Fig. 2 is a plan view thereof. Fig. 3 is an elevation, enlarged. Fig. 4 is a vertical section upon the line *yy* of Fig. 1. Fig. 5 is a representation of the back side of the machine with the gong removed. Fig. 6 is a detail view. Fig. 7 is a vertical section upon the line *xx* of Fig. 1.

A represents the shaft of a doffer, and upon its end is mounted the spur-gear *a*, which meshes with a spur-gear, *a'*, upon the shaft *a''*. This shaft is supported by the bracket *a'''*, which is bolted or otherwise secured to the frame of the machine, and carries at its front end the bevel-gear *a''''*, which meshes with the bevel-gear *a'''''* upon the shaft *a''''''*. This shaft is supported at its inner end by the sleeve *a''''''''* upon the arm *a'''''''''*, which has bearings *a''''''''''* upon the shaft *a''*, so that the shaft *a''''''''* has a vertical swinging movement upon the shaft *a''*. This movement is provided the shaft for reasons which will hereinafter appear. The shaft *a''''''''* carries a cam, B, and a worm, C, which engages with the spur-gear *c* and revolves the same. It preferably has at its outer end the weight *c'* for holding the worm down to its work, and for insuring the quick return of the shaft when operated, as hereinafter described. It is desirable that the device should be so constructed that once adjusted it shall always indicate, until otherwise adjusted, the delivery of a predetermined quantity or length of bat. It is also necessary to provide the device with an adjustment whereby it may be set to indicate the delivery of bat of any length for hats of all sizes and weights. These objects are accomplished by mechanism which governs the time of contact of the worm with the spur-gear, and it comprises the wheel or disk D, upon the shank *d* which has a dovetail or undercut recess, *d'*, on its face which receives the end *d''*, of a bolt, *d'''*, which passes through the end of the arm or lever *d''''*, and which is clamped to the wheel by means of the clamping-screw *d''''''*, so that, upon the revolution of the plate or wheel D, the lever, which is secured to the shaft *d* is caused to be moved to operate the device for disengaging the worm C from the gear *c*. The wheel carrying the lever is moved upon contact of the pin or projection *e''* on the spur-wheel *c* with the pin or projection *d*,

which extends through the upper end of the arm or lever d^4 , and this movement of the lever causes the pin d^6 , which enters the slot e in a horizontal arm, E, to finally come in contact with the arm and move it horizontally in the direction of the movement of the spur-wheel and lever d^4 , and this movement of the arm operates to lift the latch e' , on the end of the bell-crank lever e^2 , which is pivoted at e^3 , from the stud or pin e^4 upon the swinging block e^5 , and this swinging block, upon the release of the latch and the movement of the shaft a^6 , so as to bring the cam B into proper position, is drawn under the cam by the spring e^6 , so that the cam will rest thereon, and upon the continued revolution of the shaft it is apparent that the cam will ride upon the upper surface of this block or piece and will lift the shaft a^6 so as to disengage the worm from the gear c , and when the worm is so disengaged a spring, F, one end of which is attached to the bracket and the other to the spur-wheel, serves to return the spur-wheel to its original position, and at the same time to reverse the movement of the lever d^4 and the disk or wheel D, and this reverse movement of the lever causes the pin d^6 , which enters the slot g in the horizontal bar G attached to the swinging block e^5 , to be moved backward sufficiently to bring the latch stud or pin e^4 in line with the recess in the latch e' , which shuts automatically thereon and holds it in that position until it is again released upon the forward movement of the lever d^4 . The disk or wheel D has a projection, H, against which the stud or pin c^2 on the spur-wheel c strikes upon its backward movement; and it serves two purposes, first, as the wheel D has been moved a portion of a revolution upon the forward revolution of the lever d^4 it upon the reverse movement of the spur-wheel c , and upon contact with the lug or projection c^2 therewith, moves the lever or arm d^4 back to its original position; second, it then acts as a stop in preventing the further reverse movement of the spur-wheel. It is obvious that by changing the position of this stop H that the extent of the movement of the spur-wheel, before the disengagement of the worm, may be varied—that is, by moving the stop in one direction the spur-wheel will make a larger part of a revolution before the disengagement of the worm, and that moving it in the opposite direction it will make a smaller portion of a revolution; and this movement of the stop is accomplished by simply loosening the locking-nut d^5 at the lower end of the arm or lever d^4 , and turning the disk or wheel D to bring the stop H into the desired position, when the locking-nut is again turned to clamp and lock the lever to the wheel.

To indicate when the spur-gear has reached the end of the movement which it is set to make, I have arranged upon the shaft d the lever M, which carries at its end the pawl m , which has the inclined surface m' , on which the end m^2 of the bell-crank lever m^3 rides as the lever M is being moved forward, so that

the forward movement causes the tongue or striker m^4 to be brought in contact with the gong or bell. Immediately following the striking of the bell, the end m^2 of the lever rides over the pawl, and upon the backward or reverse movement of the lever M the pawl moves on its pivot backward until it has cleared the end of the bell-crank lever, when, by the spring m^5 , it is returned to its original position, or that represented in Fig. 4. The spring m^6 serves to keep the end m^2 of the lever m^3 in contact with the pawl.

I of course do not confine myself to the especial form of mechanism for connecting the shaft d with the bell-hammer, but may use any mechanical equivalent for the device herein described.

The disk D may be provided with marks to indicate where it should be set to indicate the feed of varying lengths or quantities of bat. In practice the disk or wheel D is set to cause the alarm to be sounded upon the doffer running the number of revolutions which it is necessary for it to make in producing the quantity or weight of bat which the hat then being made requires, and upon the revolution of the doffer movement is communicated to the spur-wheel c , which is revolved until it causes the operation of the tripping mechanism, which allows to be brought into place the device upon which the cam rides in automatically disengaging the driving mechanism, and upon the disengagement the parts return automatically to their normal position, the worm again engages with the teeth of the spur-wheel, and upon the operation of the doffer the device is again operated as before, and the alarm sounded to indicate the time when a certain extent or quantity of the bat has been made and fed.

It will be observed that the lever or arm d^4 , attached to the wheel or disk D, operates to trip the latch e' , which permits the cam-lifter to be moved into operative position. It will also be seen that upon the reverse movement of the spur-wheel the cam-lifter is withdrawn, held, and latched back by the latch e' .

Of course, while I have illustrated this indicating device as especially adapted for operation upon a hat-forming machine, yet I would not be understood as limiting the invention to that class of machines, for of course it may be used upon any machine where it is desired that an alarm shall be sounded or indicated at the end of a certain number of revolutions of any part of the machine.

I have referred to the machine to which my invention is applied as a hat-forming machine. I mean to be understood by that, a machine which consists of the wool-carding machine, which prepares and feeds the bat, and the machine which receives the bat from the wool-carding machine and winds it about the hat-forming cone.

Of course the invention can be applied to any wool-carding machine where it is desired

to indicate the quantity, weight, or width of the bat being carded and fed.

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

1. In a hat-forming machine, in combination with the doffer-shaft or other revolving shaft of the machine, an indicator for noting the completion of the making and feeding of a given quantity of bat, all substantially as and for the purposes described.

2. In combination with the doffer or other shaft of a hat-forming machine having the spur-wheel *a*, an indicator, and a device for varying or adjusting the time of the indication, whereby the indicator may be set to note the making and feeding of bat for all sizes and weights of hats, all substantially as and for the purposes described.

3. The combination of the spur-wheel *c*, its operating-worm C, and a device for disengaging the worm from the spur-gear operated by said gear, all substantially as and for the purposes described.

4. The combination of the spur-gear *c*, the worm-gear C, its shaft *a*⁶, having a vertical swinging movement, as described, the cam B, and the cam-lifter *e*⁵, operated by the spur-gear *c*, all substantially as and for the purposes described.

5. The combination of the cam-lifter *e*⁵, its latch *e*⁷, and the tripping-bar E, operated by the spur-gear *c*, all substantially as and for the purposes described.

6. The combination of the spur-gear *c*, the bar G, and the cam-lifter *e*⁵, all substantially as and for the purposes described.

7. The combination of the spur-gear *c*, the spring *e*⁶, and the arm G, all substantially as and for the purposes set forth.

8. The combination of the spur-gear *c*, the arm *d*⁴, adjustable as described, the stop H, and the lug or projection *c*² and spring F, all substantially as and for the purposes described.

9. The combination of the arm *d*⁴ and the adjustable stop, disk, or wheel D, all substantially as and for the purposes described.

10. The combination of the arm *d*⁴, adapted upon its movement to operate the alarm mechanism, the spur-wheel *c*, moved in one direction by the worm-gear C and upon the reverse direction by the spring F, all substantially as and for the purposes described.

11. The combination of the arm *d*⁴, connected with the alarm mechanism, and the adjusting-wheel D, having the stop H, the spur-wheel *c*, having the lug or projection *c*², the worm C, the tripping-latch *e*⁷, cam-lifter *e*⁵, and cam B, all substantially as and for the purposes described.

12. The hinged or pivoted shaft *a*⁶, carrying the worm C and cam B and weight *c*⁷, all substantially as and for the purposes described.

13. In combination with the pivoted worm-shaft and its cam B, the cam-support *e*⁵, moved into position by a spring and withdrawn by the reverse movement of the spur-gear *c*, all substantially as and for the purposes described.

14. The combination of the bars E G, having the slots, with the arm *d*⁴, having the pin *d*⁶, which projects into said slots and which is adapted to be moved by the worm operating the spur-gear in one direction and in the reverse direction by a spring operating the spur-gear, all substantially as and for the purposes described.

ISAAC F. BROWN.

Witnesses:

F. F. RAYMOND, 2d,
J. M. DOLAN.