

(No Model.)

M. O. ROBERTS.

HORSE POWER.

No. 355,719.

Patented Jan. 11, 1887.

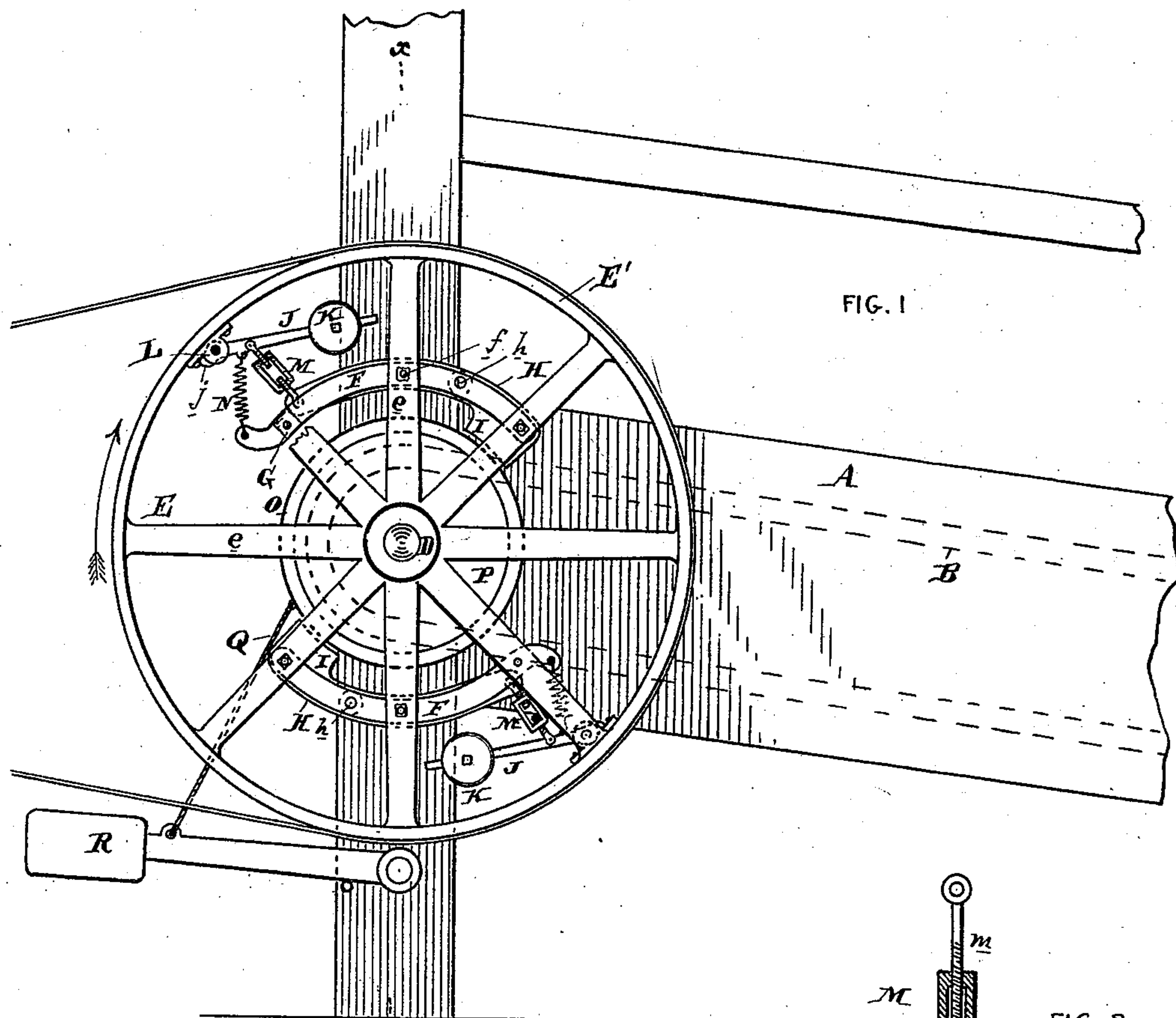


FIG. 1

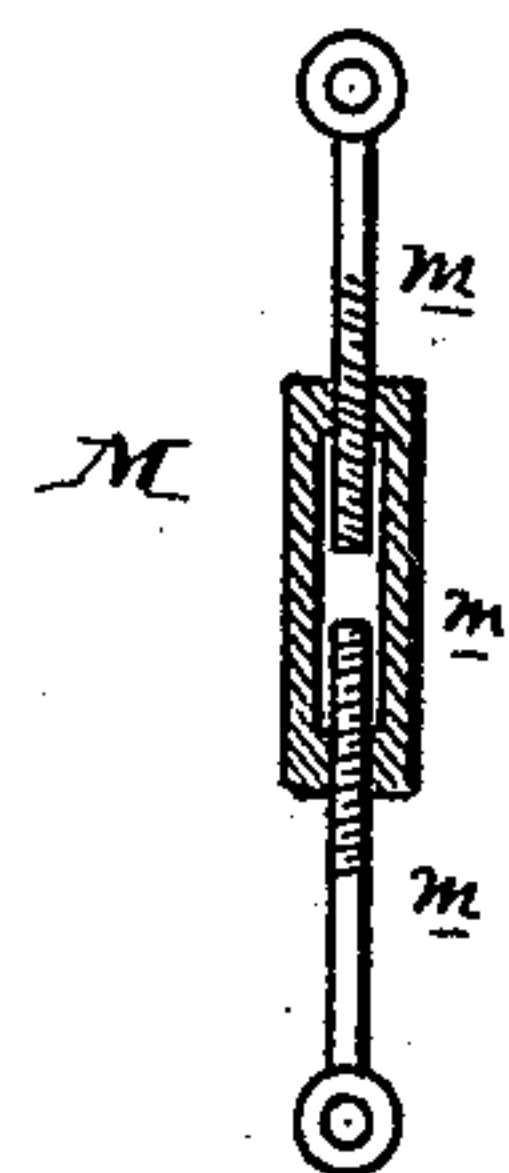
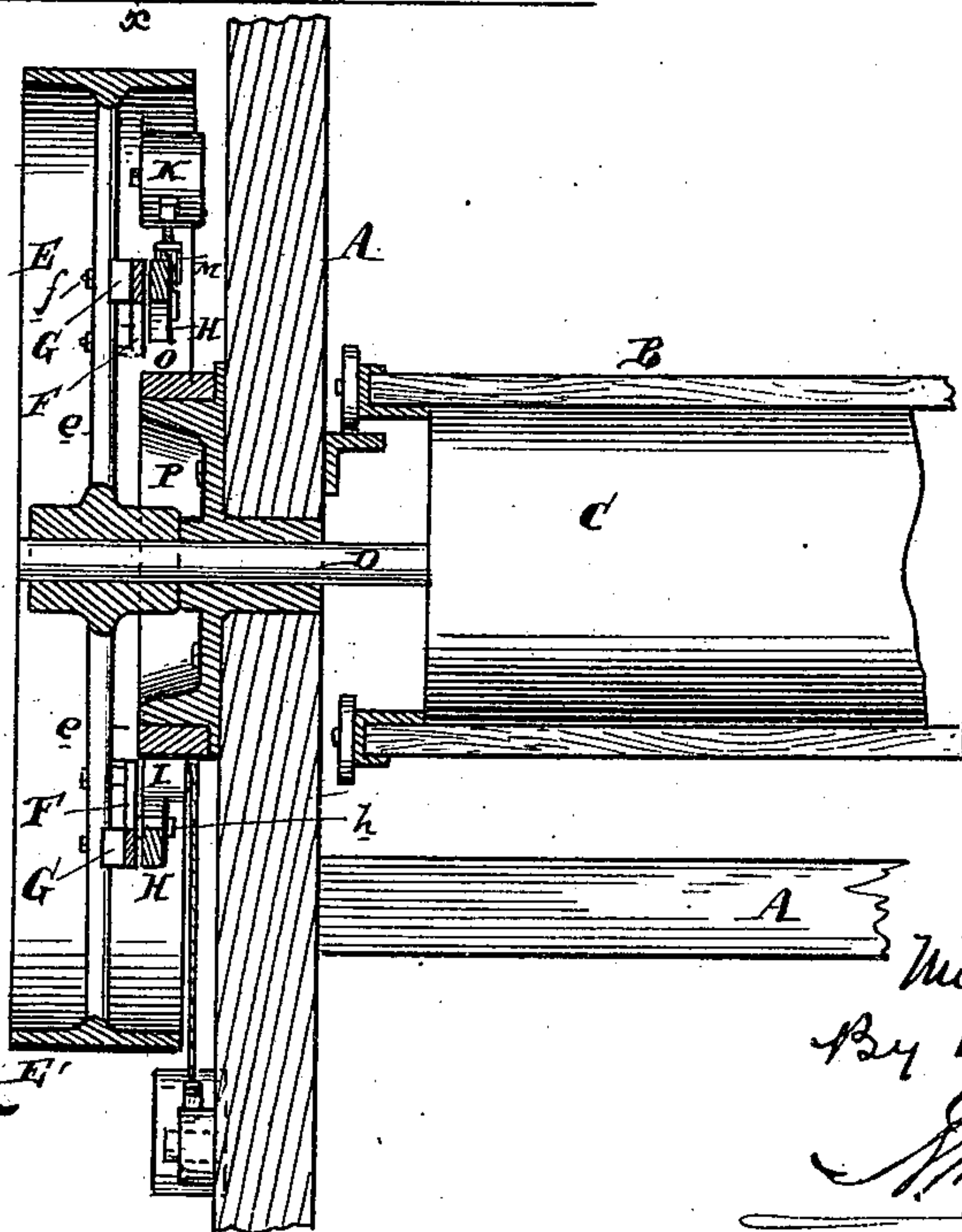


FIG. 3

FIG. 2



Attest  
E. M. Breckinridge.  
Notary Public.

Inventor  
Milton O. Roberts  
By his atty.  
*[Signature]*



# UNITED STATES PATENT OFFICE.

MILTON O. ROBERTS, OF COLLEGEVILLE, PENNSYLVANIA.

## HORSE-POWER.

SPECIFICATION forming part of Letters Patent No. 355,719, dated January 11, 1887.

Application filed June 26, 1886. Serial No. 206,339. (No model.)

*To all whom it may concern:*

Be it known that I, MILTON O. ROBERTS, of Collegeville, county of Montgomery, and State of Pennsylvania, have invented an Improvement in Horse-Power Machines, of which the following is a specification.

My invention has reference to horse-power machines; and it consists of certain improvements, all of which are fully set forth in the following specification and shown in the accompanying drawings, which form part thereof.

The object of my invention is to keep the speed of the machine under control by means of certain governing appliances. The rapidity of motion is commensurate with the power to be obtained and depends largely upon the resistance offered; and it will clearly be seen that any diminution of the resistance will produce a great acceleration of speed, which might give rise to the anomaly of the machine running away with the horse, or of compelling the horse to overexertion. The object is also to insure a uniform speed being imparted to the machine driven by the horse-power machine. All such difficulties are completely obviated by this invention.

By means of a governor placed upon the band-wheel an excessive speed will be rendered impossible. Pivoted to the spokes of the band-wheel are curved metal plates, preferably two, though the number is not material to the principle of the invention. These curved pieces have loosely pivoted to them second pieces, of substantially similar shape, which act as levers. On the outer flange of the drive-wheel above the ends of the curved plates are brackets which hold adjustable weighted levers. These second levers are joined by adjustable links to the ends of the first levers. On the shorter ends of the first-mentioned levers are brake-shoes. Now, when the speed of the drive-wheel is accelerated, the weighted levers will be thrown by the centrifugal force out away from the center of the wheel, drawing up the ends of the levers to which they are attached, thus forcing down the brake-shoes upon a ring. This ring may loosely surround a fixed cylinder. Attached to this ring is a chain, the other end of which is fastened

to a weighted lever. Thus when the shoe-brake presses against the ring it will carry the ring with it about the cylinder, and will wind up the chain and weight, retarding or bringing to a stop the revolving shaft of the machine.

In the drawings, Figure 1 is a side elevation of a portion of the machine, showing the band-wheel and governing mechanism. Fig. 2 is a sectional elevation of the same through the line *xx*, and Fig. 3 is a view of the variable link for connecting the levers of the governing device.

A is the frame or body of the machine.

B is the endless-chain treadway or apron.

C is the cylinder about which the treadway or apron passes, and D is its shaft.

E is the band-wheel, to the spokes *e* of which the curved metal piece F is riveted by the bolts *f* through the blocks or supports G, which may, if desired, be made integral with the spokes of the wheel.

H is the brake-shoe lever, and is loosely pivoted at *h* to the plate F, and has the shoe I at its shorter end. This lever H thus forms a lever, with *h* as its fulcrum. On the inner surface of the flange E' of the wheel E is fixed or cast integral with the wheel a bracket, L, to which is pivoted the lever J, having a heel, *j*, and an adjustable weight, K. This lever J is attached by the adjustable link M to the lever H, and by the spring N to the curved plate F or wheel. It will be observed that a similar device is also placed on the opposite side of the wheel-hub; but the invention is not limited to the number of relative positions of these devices, though the arrangement here shown is preferable.

O is a ring loosely surrounding the cylinder P, which is firmly secured to the framework of the machine.

Q is a chain or cable attached to this ring O and also to the lever R.

The operation of the machine will now be clearly seen. The motion of the treadway or apron B imparts through the cylinder C and shaft D a similar motion to the band-wheel E, and the speed of this wheel will by centrifugal force tend to throw out the weighted lever



J, which, through the link M, draws up the one end of the lever H and forces down the other end, pressing the brake-shoe I upon the ring O, thus creating a friction and carrying  
 5 this ring with it, and winding up the lever R by the chain Q. This will necessarily result either in lessening the speed of the machine or in totally stopping it. The lever J has an adjustable weight, K, which may be fixed to  
 10 suit the weight of the horses or the power they exert. The link M is made of two screws, *m* and *m'*, one having right-hand and the other left-hand threads, and the nut *m'*, into which these are screwed. This link may thus be  
 15 varied to compensate for wear on the brake-shoe I, so that the apparatus may be kept in order and adjusted to exactitude. The spring N is used simply to keep the lever J normally out of operation, as without it the brake-shoe  
 20 would be forced down upon the ring O; and the heel *j* is to keep the lever J from becoming drawn in too far by the spring. By placing the lever J near the outer part of the wheel as far as possible from the center the centrifugal force is increased, and consequently the  
 25 efficiency of the governor.

The feature of carrying the weighted levers on or near the flange of the band-wheel, which is of large diameter, is very important, not  
 30 only for simplicity of construction, but also in view of the increased travel of the weighted governor-levers, which makes them more sensitive, and the protection the governor receives by being placed within the flange of the wheel  
 35 and sheltered thereby.

I do not limit myself to the mere details of construction here shown, as they are merely those apparently best suited to the explanation of the device, but may clearly be varied  
 40 in many ways without departing from the invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

45 1. In a horse-power machine, an endless tramway and power-shaft driven thereby, in combination with a band-wheel secured thereon, a weighted governor-lever pivoted on or near the flange of the band-wheel, a cylindrical brake-surface, a brake-lever carried by  
 50 the band-wheel and pressing upon said brake-surface, and a positive connection between the brake-lever and governor-lever, substantially as and for the purpose specified.

55 2. In a horse-power machine, an endless tramway and power-shaft driven thereby, in combination with a band-wheel secured thereon, a weighted governor-lever pivoted on or near the flange of the band-wheel, a cylindrical brake-surface, a brake-lever carried by  
 60 the band-wheel and pressing upon said brake-surface, and an adjustable connection between the brake-lever and governor-lever, substantially as and for the purpose specified.

65 3. In a horse-power machine, an endless

tramway and power-shaft driven thereby, in combination with a band-wheel secured thereon, a governor-lever pivoted on or near the flange of the band-wheel and provided with  
 70 an adjustable weight, a cylindrical brake-surface, a brake-lever carried by the band-wheel and pressing upon said brake-surface, and a connection between the brake-lever and governor-lever, substantially as and for the purpose specified.

75 4. In a horse-power machine, an endless tramway and power-shaft driven thereby, in combination with a band-wheel secured thereon, a weighted governor-lever pivoted on or near the flange of the band-wheel, a loose cylindrical brake-surface, a brake-lever carried  
 80 by the band-wheel and pressing upon said brake-surface, and a connection between the brake-lever and governor-lever, a fixed support for the loose brake-surface, and a weighted  
 85 lever connection acting upon said loose brake-surface to hold it in opposition to the action of the brake-lever, substantially as and for the purpose specified.

90 5. The combination of the tramway B, frame A, the power-shaft D, band-wheel E secured thereon, lever J, having adjustable weight K and pivoted under the flange of the band-wheel brake-surface O, brake-lever H, having  
 95 shoe I to press upon the surface O, spring N, acting on the lever J, and an adjustable connection, M, between the levers J and H, substantially as and for the purpose specified.

100 6. The combination of the tramway B, frame A, the power-shaft D, band-wheel E secured thereon, lever J, having adjustable weight K and pivoted under the flange of the band-wheel brake-surface O, brake-lever H, having  
 105 shoe I to press upon the surface O, spring N, acting on the lever J, and an adjustable connection, M, between the levers J and H, the governor comprised in the parts J, O, H, I, N, and M being located within the flange of the wheel E, substantially as and for the purpose specified.

110 7. In a horse-power machine, the combination of the endless tramway, the power-shaft, a stationary cylindrical brake-surface concentric with said shaft, a band-wheel secured to said power-shaft of greater diameter than  
 115 the brake-surface and having its flange arranged over said brake-surface, a pivoted brake-lever having a shoe to press on said surface, a pivoted weighted lever, and a connection between said levers, the said lever  
 120 being secured to and carried by the band-wheel and located in the annular space between the brake-surface and flange of the band-wheel, substantially as and for the purpose specified.

125 8. In a horse-power machine, the combination of the endless tramway, the power-shaft, a stationary cylindrical brake-surface concentric with said shaft, a band-wheel secured to said power-shaft of greater diameter than  
 130



the brake-surface and having its flange arranged over said brake-surface, a pivoted brake-lever having a shoe to press on said surface, a pivoted weighted lever, and an adjustable link-connection between said levers, the said levers and link-connection being secured to and carried by the band-wheel, and located in the annular space between the

brake-surface and flange of the band-wheel, substantially as and for the purpose specified: 10

In testimony of which invention I hereunto set my hand.

MILTON O. ROBERTS.

Witnesses:

F. G. HOBSON,

A. D. FETTEROLF.