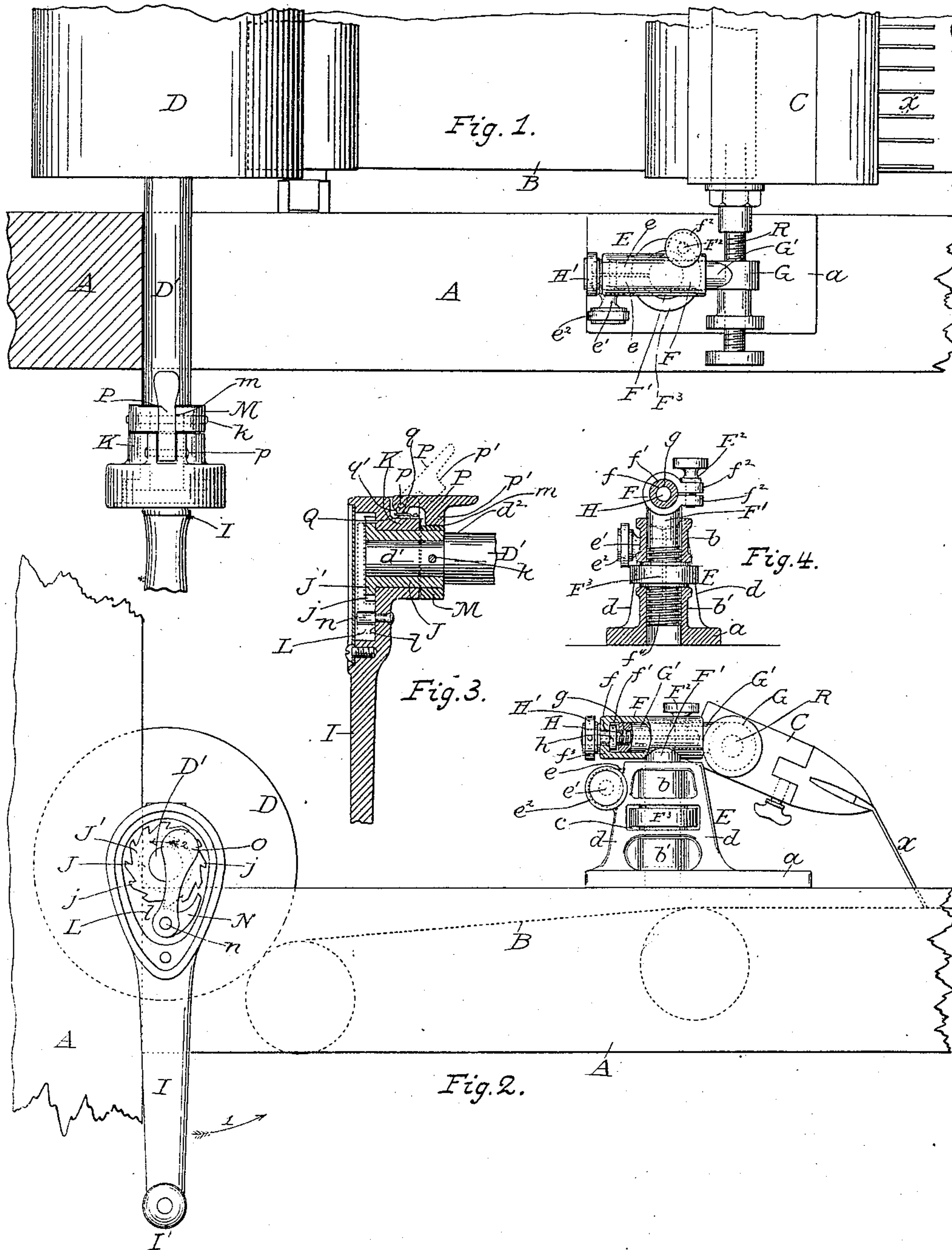


(No Model.)

C. BURROWS.
RULING MACHINE.

No. 568,236.

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UNITED STATES PATENT OFFICE.

CHARLES BURROWS, OF SCHENECTADY, NEW YORK.

RULING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 568,236, dated September 22, 1896.

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To all whom it may concern:

Be it known that I, CHARLES BURROWS, a citizen of the United States, and a resident of Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in Ruling-Machines, of which the following is a specification.

My invention relates to improvements in machines for ruling flat paper; and it consists in the devices and parts and combinations of devices and elements hereinafter described, and set forth in the claims.

The objects of my invention are to provide the pen-beam of a ruling-machine with a supporting-standard combining devices by means of which the pen-beam will be supported from the frame and be readily and nicely adjusted in either a vertical or horizontal direction (both lateral and longitudinal) in relation to the endless apron of the machine; also to provide between the shaft of the driving-roller of the endless apron a crank for operating the same by hand while the parts of the machine are being adjusted and set, and with mechanism by which the shaft of said driving-roller may be revolved without affecting the crank thereon by revolving it, or to render the crank capable of revolving the said shaft in one direction, or be so fixed that the shaft may at will be revolved by the crank in either direction. I attain these objects by the means illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of a portion of a ruling-machine embodying the improvements in this invention. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional view illustrating the mechanisms between the driving-shaft and crank, and Fig. 4 is a section illustrating the parts in the pen-beam standard.

The same letters of reference refer to similar parts throughout the several views.

In the drawings, A is the framework of a ruling-machine.

B is the endless apron, on which sheets of flat paper to be ruled are carried.

C is the pen-beam, which carries the pens employed for ruling the paper.

D is the driving-roller of the endless apron,

and D' is the driving-shaft of said driving-roller, which shaft and roller thereon are generally revolved by power by means of band-wheels and belts or gear-wheels, (not shown,) as those driving mechanisms are well known to the trade and therefore require no particular description.

The pen-beam C is arranged across the machine and over the apron B, and is supported at each end from the side rails of the frame of the machine by standards E, one of which standards is shown in Figs. 1, 2, and 4. These standards E (one not shown) are each provided with an attaching portion, as *a*, preferably horizontal, by means of which the bodies of the standards may be secured to the side rails by screws or bolts. This standard E has provided in it vertical smooth-bore sleeves *b b'*, Fig. 4, which sleeves are separated at any preferred point in the length of the standard by the transverse opening *c*, Fig. 2. The union of these sleeves *b b'* is strengthened by vertical ribs *d d*, and the upper sleeve *b* is split and its lateral split sides are each provided with a lug *e*, Fig. 1, which lugs are perforated to receive a clamping-bolt or a screw *e'* which I at this present time prefer to be made with a suitable finger-head *e²*, while the shaft of the screw is provided with a screw-thread and screws into a screw-threaded hole in one of the lugs.

F is a horizontal sleeve mounted on a vertical post F', the axis of which post is at right angles to that of sleeve F. The post F' is made with a diameter corresponding with that of the bore of the sleeves *b b'*, so as to nicely fit said bores and be freely moved vertically in either direction and swivel in the same when the clamping-screw *e'* is loosened. The outer end of this horizontal sleeve F is centrally perforated at *f*, which perforation is smaller than that of the bore *f'* of said sleeve. The opposite end of this sleeve F is split and provided with lugs *f² f²*, suitably perforated and provided with the clamping bolt or screw F² for tightening at will the split portions of sleeve F on the piece to be secured therein.

G is an adjustable bearing in which the end pintle of the pen-beam C is supported. This bearing has integral with it an arm G' of diameter corresponding with the diameter of

the bore of the horizontal sleeve F, which receives said arm. A screw-threaded perforation g is provided central and lengthwise in said arm, and an adjusting-screw H, working in screw-threaded perforation g in arm G', is provided for moving said arm G' in either direction within sleeve G. This adjusting-screw is provided with collar h , which is fixed on or is integral with the shaft of screw H, and is in place at the inner side of the perforated end wall f^3 of the horizontal sleeve F.

H' is a finger-head securely fixed on the outer end of the screw H or made integral with the same, with its inner end operating as a shoulder for bearing against the outer side of the perforated end wall f^3 for coaction with collar h for holding said screw from moving lengthwise in either direction in relation to the sleeve F. By means of this adjusting-screw H the arm G' of the bearing G may, when the clamping-screw F² of the split sleeve F is loosened, be readily adjusted horizontally for carrying the pintle of the pen-beam in either direction, as may be preferred or be necessary for adjusting the pen-beam in direction of the length of the endless apron.

The horizontal sleeve F and bearing G, carried by it, may be adjusted in a vertical direction when the clamping-screw e' of the split sleeve b is loosened, and any suitable means may be employed for holding the post F' of said horizontal sleeve at the place it may be adjusted to in the vertical sleeves $b b'$, yet I at this time give preference to the employment of the revolving finger-nut F³, arranged within the opening c between sleeves $b b'$, working on a screw-thread f^4 , provided on post F', the lower end of sleeve b , and the upper end of sleeve b' as shoulders, against which the opposite ends of the finger-nut F³ have bearing for preventing the latter from moving vertically in either direction. When this finger-nut F³ is revolved in a proper direction, it will carry, through post F', sleeve F, and the bearing-arm G', the bearing G upwardly, and by a reversed revolution said bearing G will be carried downwardly, and thereby an operator may nicely adjust said bearing G and the pintle of the pen-beam working therein.

The pen-beam pintle in Fig. 1 is shown to be screw-threaded for effecting at will a lateral or transverse adjustment of the said pen-beam, as is generally practiced by the trade.

The driving-shaft D' of the roller D for driving the endless apron is generally revolved by steam or other power when ruling paper for merchantable work; yet when changing the pens and pen-beam and while adjusting the same the said roller is required to be moved by hand and at will of the operator making the adjustments.

I is a crank, and I' is the handle for operating the same when adjustments of the pen-

beam and pens are being made. This crank I is permanently secured on shaft D', so that the latter may be revolved by power for merchantable ruling, while the crank itself will remain pendent; and yet the crank may at will be made to revolve the said shaft in one direction or be so fixed to said shaft as to revolve it in either direction when the apron is to be moved alternately in opposite directions, as may be required while adjustments of parts are to be made.

The shaft D' is provided with the reduced end portion d' , terminating with the shoulder d^2 . On this reduced end portion is the nicely-fitting sleeve J, provided on its outer end with an outwardly-projected annular flange J', in the periphery of which are ratchet-teeth $j j$. The head end of the crank I is provided with sleeve K, nicely fitting the periphery of the sleeve J, and is calculated to be loose on the same. It is also provided with recess L, made in said head from its face side and against the sunken side, as l , of which the inner side of flange J' has bearing.

M is a collar nicely fitting on the inner end portion of sleeve J and abutting against the inner end of sleeve K of the crank-head, which collar may be secured in place on sleeve J by any suitable means, yet I give preference to use of pin k , passing through said collar M, sleeve J, and the reduced end of shaft D' for that purpose, and when so secured the crank will be held on shaft D' and be adapted to be freely revolved on the periphery of sleeve J.

N is a pawl arranged in recess L and pivoted by pivot n to the head of the crank and at a point below the ratchet-teeth j on the flange of the sleeve J, so that it may engage with said teeth when the crank is moved in a proper direction, say as in direction of arrow 1 in Fig. 2.

O is a gravity-lever also pivoted on the pivot n , and also so secured with pawl N that when said lever is moved to its limit in direction of arrow 2 in Fig. 2 it may carry the pawl into engagement with the ratchet-teeth j to hold with the same so long as the operator is moving the crank in direction of arrow, with the drag of the endless apron tending to resist such movement. There is also provided with the head end of the crank an arm P, which is pivoted by pivot p preferably at a point on the upper side of the sleeve K. This arm P is provided with a retaining-finger p' , and with a side portion of the collar M is provided a notch m , or a projection with which finger p' may engage and thereby hold with said collar when the arm P is moved away from position of dotted lines to that of full lines in Fig. 3. The pivoted end of this arm P has formed with it suitable flattened faces $q q'$, against either of which there is arranged and secured spring Q for bearing, by its elastic pressure, on either of the flattened faces $q q'$ for holding said arm in place moved to. When the said arm P is thrown up, as

indicated by dotted lines in Fig. 3, the spring Q will exert an elastic pressure against the flattened face q' and thereby free the arm from engagement with the fixed collar M, when the crank will hold with shaft D' solely by the pawl and ratchet described; but when the arm P is thrown down to position of full lines in Fig. 3 the spring Q will have pressure on the flattened face q of arm P and securely hold the latter in such an engagement with the fixed collar M that the crank may be so locked with shaft D' that the latter may be revolved by said crank in either direction.

Although the pintles R (one not shown) of the pen-beam C may each consist of a simple or plain cylindrical piece properly secured to the ends of the pen-beam supported in adjustable bearings G in standards E, yet I give preference to an adjustable pintle, by means of which the pen-beam may be moved longitudinally and transversely to the direction of movement of the endless apron B.

By my above-described improvements the pen-beam may readily be adjusted and secured in place and the crank be secured to the shaft of the apron-driving roller, so that the apron may be moved at will in either direction while the pen-beam and the pens therewith are being adjusted, and the crank be securely retained at all times on said shaft without being revolved by it when being revolved by power, and be at all times in readiness for an operator to revolve the said roller for driving the endless apron by hand when it is preferred to dispense with the use of power for a short time, as is often required.

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

1. In a ruling-machine the combination with a pen-beam standard provided with vertical split sleeve having with it a clamping device, and a horizontal split sleeve provided with a clamping device and connected with a vertical post calculated to be adjusted in said vertical split sleeve, of a pintle-bearing connected with a horizontal arm calculated to be adjusted and secured in said horizontal split sleeve, whereby said pintle-bearing may be adjusted either vertically or horizontally or in both directions and secured, substantially as and for the purposes set forth.

2. In a ruling-machine the combination of a pen-beam pintle-bearing which is connected with a horizontal arm, and a split horizontal sleeve provided with a clamping device and calculated to receive and securely hold the arm of the pintle-bearing and having connected with it a vertical screw-threaded post, of a standard having two vertical sleeves which are separated by transverse opening, with one of the said two vertical sleeves split and provided with a clamping device, of a revolving finger-nut arranged in the opening between the said two vertical sleeves and working on the screw-threaded post of said

horizontal sleeve, substantially as and for the purposes set forth.

3. In a ruling-machine the combination with the arm of the adjustable bearing G, provided with a central screw-threaded perforation, a horizontal split sleeve provided with a clamping device and connected with a vertical post, and a vertical standard calculated to receive said post of an adjusting-screw working in said screw-threaded perforation of said arm and provided with a collar working against the inner side of the perforated end wall portion of said split sleeve and provided with a finger-head having bearing against the outer side of the said perforated end wall and calculated to be revolved at will, substantially as and for the purposes set forth.

4. In a ruling-machine, the combination with standard E provided with two vertical sleeves b, b' the upper one being split and provided with a clamping-screw, and having between said sleeves the opening c , the horizontal sleeve F connected with screw-threaded post F' , and having its open end portion split and its opposite portion provided with the perforated end wall f^3 , and finger-nut F^3 in opening c and working on the screw-threaded post, of the bearing G provided with arm G' having a central screw-threaded perforation, and the adjusting-screw H working in said screw-threaded perforation and provided with collar h , between the arm G' and end wall f^3 of sleeve F, and with finger-head H' against the outer side of said end wall f^3 , substantially as and for the purposes set forth.

5. In a ruling-machine, the combination with a driving-shaft, of sleeve J, fitting on the outer end of said shaft and provided on its outer end with an outwardly-extended flange having in its periphery ratchet-teeth, of a head, of a crank, which is provided with a sleeve fitting on sleeve J and adapted to revolve on the same back of its flange and provided on its outer side with a pawl and gravity-lever which are together pivoted upon the head of said crank with the pawl in position for engagement with a tooth of the ratchet-wheel when the gravity-lever is carried past a perpendicular, and a device having bearing against the rear end of the sleeve of the crank-head, substantially as and for the purposes set forth.

6. In a ruling-machine, the combination with the driving-shaft of an apron-driving roller, of the flanged sleeve J provided with ratchet-teeth in the periphery of the flange, of a crank-head having in its face side a recess and provided with a sleeve K loosely mounted on the sleeve J back of the ratchet-teeth, pawl N and gravity-lever O, together pivoted by pivot n in the recess in the crank-head with the pawl in position for engagement with a ratchet-tooth of sleeve J, when lever O is in position past a vertical line.

7. In a ruling-machine the combination with a driving-shaft of an apron-driving roller

and a crank having in its end head a circular perforation loosely receiving the outer end of said shaft or a sleeve thereon, so as to adapt the crank to freely revolve on the same, of
5 piece M fixed on said driving-shaft, arm P pivoted on the end head of said crank and provided with a holding device adapted to engage with a holding device provided on said piece M, and spring adapted to retain said arm P in place it may be turned to, substantially as and for the purposes set forth. 10

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