No. 879,189. PATENTED FEB. 18, 1908.

J. MUNRO & A. GERARD.

AUTOMATIC COUNTER.

APPLICATION FILED NOV. 29, 1905.

2 SHEETS—SHEET 1.

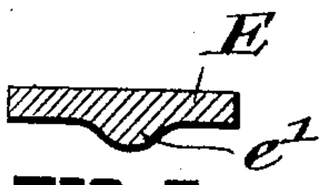

FIG. 5

FIG. 1.

FIG. 6.

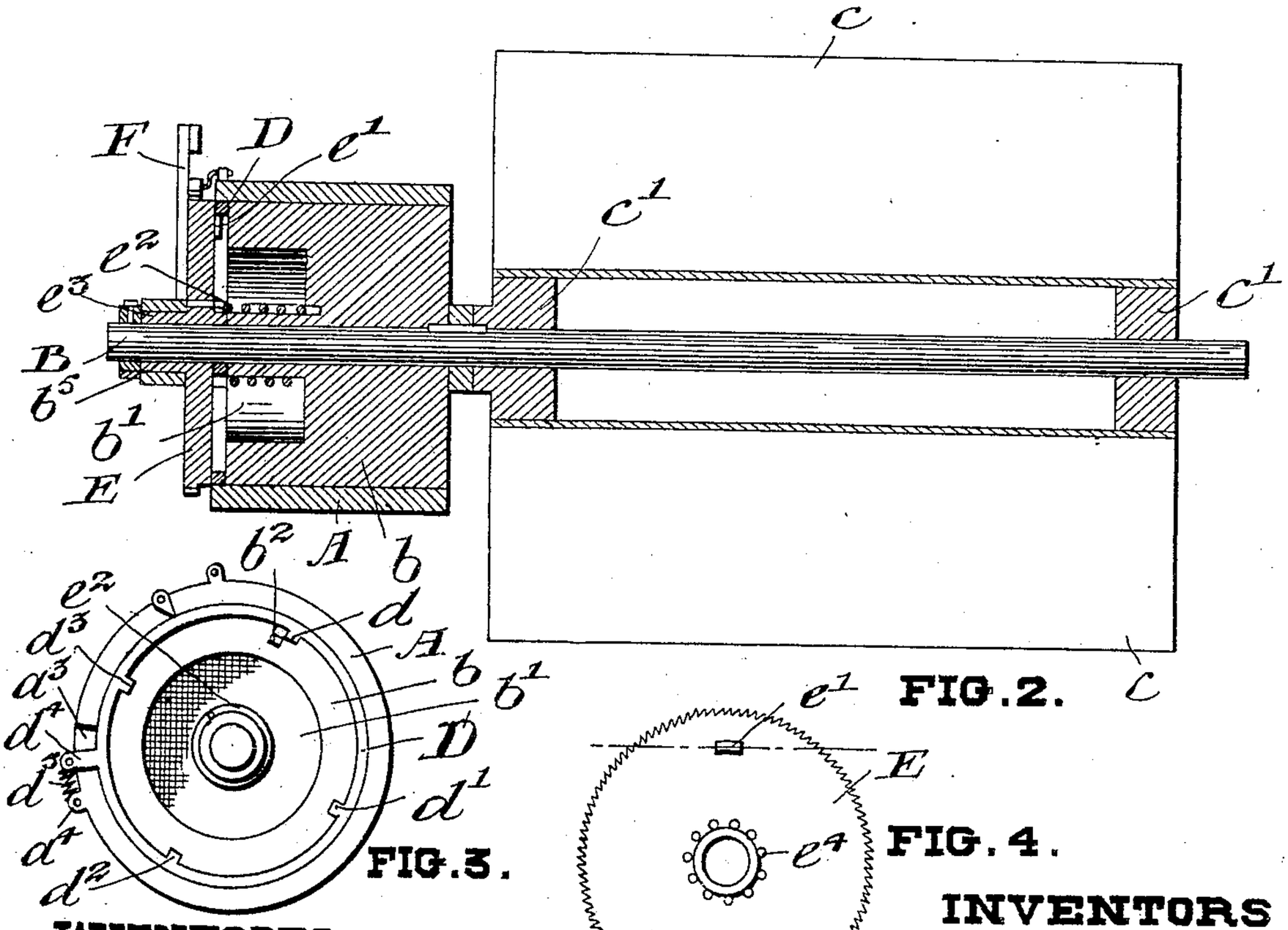

FIG. 2.

FIG. 3.

FIG. 4.

WITNESSES

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2 SHEETS—SHEET 2

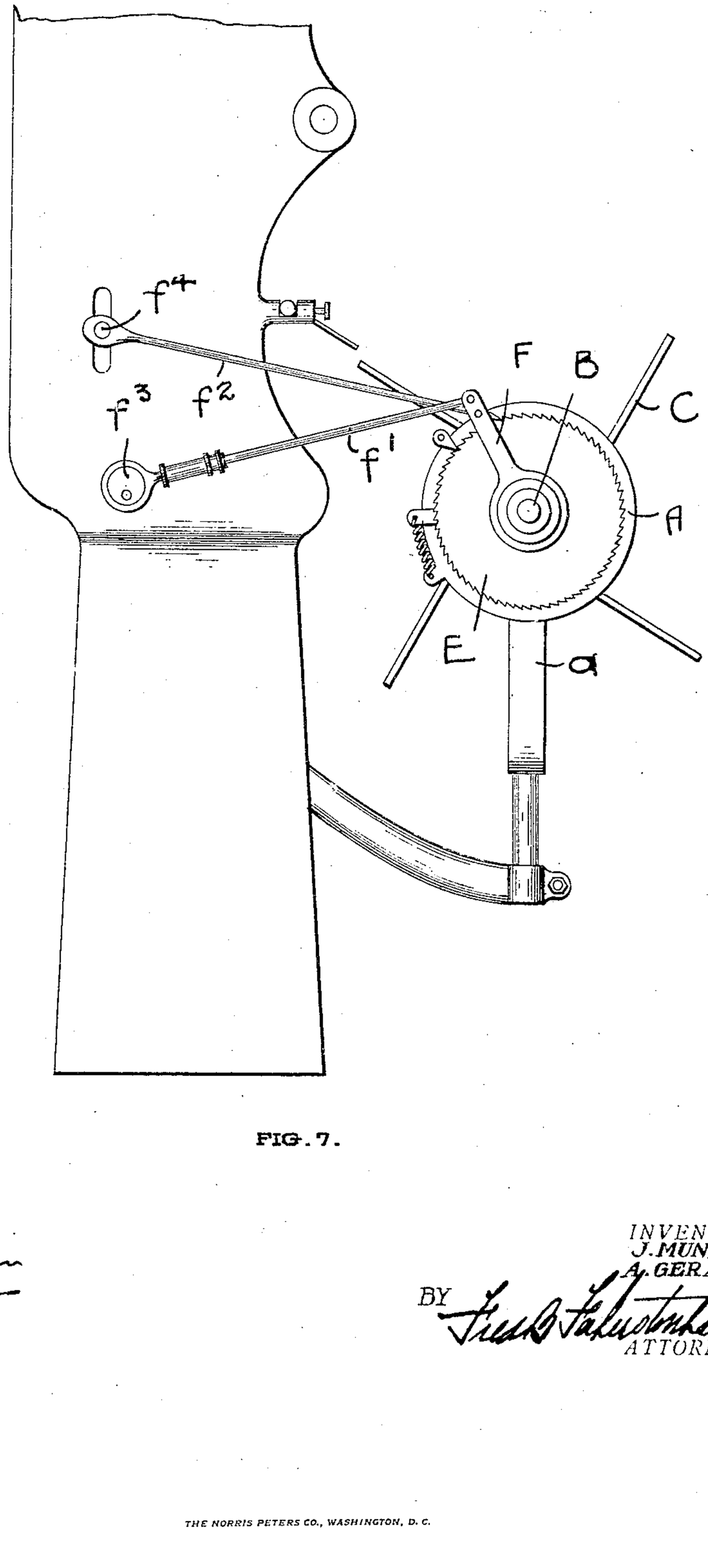

FIG. 7.

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AUTOMATIC COUNTER.

No. 879,189. Specification of Letters Patent. Patented Feb. 18, 1908.

Application filed November 29, 1905. Serial No. 289,675.

To all whom it may concern:

Be it known that we, JOHN MUNRO, printer, and ADAM GERARD, machinist, both of the city of Ottawa, in the county of Carleton, Province of Ontario, Canada, having invented certain new and useful Improvements in Automatic Counters, do hereby declare that the following is a full, clear, and exact description of the same.

Our invention relates to improvements in automatic counters particularly adaptable for use in connection with printing machines and the objects of our invention are to provide a device of cheap and simple construction which will receive the work until a certain number are deposited and then automatically remove the same out of the way, thus avoiding the necessity for the workmen counting the work and insuring that the count shall always be accurate, further objects being to provide means whereby when the machine fails to print the counter will not register; and it consists essentially of a rotatably supported shaft, a plurality of receiving pockets carried thereby, means for normally restraining the rotation of said shaft, means for periodically releasing said restraining means and allowing the shaft to rotate a predetermined part of its revolution and spring means to cause the rotation of said shaft when free, the various parts of the device being constructed and arranged in detail as hereinafter more particularly described.

Figure 1 shows a perspective view of our automatic counter a portion thereof being in section to more clearly show the construction of the same. Fig. 2 shows a longitudinal section view through the same. Fig. 3 is an end view with the ratchet wheel E removed. Fig. 4 is an elevation of the ratchet wheel E. Fig. 5 is a sectional view on the line 3—3 Fig. 4. Fig. 6 is an enlarged sectional detail of the spring held dog b^2. Fig. 7 is an elevation showing our automatic counter attached to the frame of a printing machine.

In the drawings like letters of reference indicate corresponding parts in each figure.

While in the drawings we have not shown our automatic counter attached to any particular form of printing machine yet it is to be understood that it will be attached in such a position thereto that the work coming from the printing machine will drop into receiving pockets of the counter. The manner of accomplishing this is quite well known to those skilled in the art as in this art automatic counters have attained a distinct status.

A is a cylindrical casing which is supported by a brace a which is secured to some suitable part of the printing machine so as to support the automatic counter in its desired position. Within the casing A is journaled a short cylinder b through the center of which extends the main shaft B of the counter. To the opposite ends of the shaft B is attached the work receptacle C which may be of any suitable form and as shown comprises a plurality of leaves c c c c which are attached to square central portions c^1 and thus form between them receiving pockets for the work. With the device arranged as in Fig. 1 the work would drop into the uppermost pocket.

b^2 is a dog which protrudes from the end face of the cylinder b and which is secured in a recess b^3 provided in a cylinder and in which is also located a spring b^4 which normally holds the dog in its outermost position but permits it to be pressed in against the pressure of the spring until the end thereof is in the same plane as the end face of the cylinder.

The cylinder b is made somewhat shorter in length than the inclosing case and in the space thus left a ring D is inserted having thereon a plurality of stops d, d^1 d^2 d^3 which are symmetrically situated around the inner circumference of the ring. These stops are adapted to be normally engaged by the dog b^2 thus preventing the rotation of the shaft. To cushion the impact of the dog b^2 with the stops we provide a lug d^4 formed integral with the ring D which extends through a slot a^3 in the casing and has secured to the end of it a tension spring d^5 the opposite end of which is secured to a suitable lug a^4 formed integral with the casing. In this manner the ring D may rotate a slight distance against the resiliency of the spring d^5.

E is the ratchet wheel which is loosely secured on the shaft B and the teeth of which are engaged by a spring held pawl e pivoted to a lug a^2 in the casing.

F is an arm which is preferably loosely supported from an annular boss e^3 formed integral with the ratchet wheel. This arm carries a spring held pawl f adapted also to engage the teeth of the ratchet wheel. A rod f^1 is pivotally connected to the end of

the arm F, the opposite end of which is connected to an eccentric f^3 on the main shaft which is adapted to reciprocate the arm f^1 each time the press prints, thus moving the ratchet wheel E a distance corresponding to one tooth. It is usual in this form of automatic printing press to provide means whereby, when the press fails to print, the impression cylinder drops. This desired movement is utilized in our device by means of a crank lever f^2, one end of which is connected to the end f^4 of the impression cylinder and the other end of which extends through the lug a^1 secured to the casing and is connected to the end of the pawl, whereby when impression cylinder drops down as above described, the end of the lever f^2 will be lowered raising the opposite end which will raise the pawl from in contact with the ratchet teeth and so prevent rotation of the ratchet wheel over this portion of the press.

e^2 is a helical spring one end of which is connected to the ratchet wheel and the other to the cylinder b preferably extending in an annular recess b^1 in the cylinder thus economizing space. To provide adjustment of the spring we provide a plurality of holes e^4 in the ratchet wheel in any one of which the end of the spring may be secured. At the commencement of the operation of the machine there is no tension in the helical spring e^2.

e^1 is a side cam secured to or formed integral with the side of the ratchet wheel and which is adapted in its revolution to come in contact with the spring held dog b^2. This dog is made of such width that the lower half of it extends beyond the stops when abutting them and this lower half is engaged by the cam e^1 in its revolution which will press the dog into its recess b^3 and hence release the shaft as will be hereinafter more fully described. A collar d^5 is preferably secured on the end of the shaft B to secure the various parts of our device together.

Having now described the various details of our device we will briefly point out the method of operation of the same: The stops d d^1 d^2 d^3 are placed fractional distances around the circumference of the ring D and the mechanism is so arranged that every time the press prints the ratchet wheel will be moved one tooth. Thus assuming that we have one hundred teeth in the ratchet wheel the cam e^1 would move from one stop d to the next during the time the press had printed twenty-five times. Assuming for the sake of illustration that the dog b^2 is abutting the stop d and the cam e^1 is in a position opposite the stop d^3 it will be seen that each time the press prints the cam will be moved forward a distance corresponding to one ratchet tooth and by the time the press has printed twenty-five times it will be in contact with the dog b^2. If there was no tension in the spring e^2 when the cam e^1 was opposite the stop d^3 by the time the cam gets around to the stop d the spring would be wound up to a considerable extent exerting a torque which would rotate the shaft were it not prevented from doing so by the dog b^2 abutting the stop d. When, however, the cam presses the dog b^2 into the recess b^3 it withdraws it from contact with the stop d and releases the shaft which under the torque exerted by the spring at once rotates until the stop d^2 having sprung out comes in contact with the next stop d^1. The operation as hereinbefore described is then repeated. The shaft rotating while the dog b^2 moves from the stop d to d^1 turns the receptacle C which empties the pocket in which the work had hitherto been accumulating and as this pocket empties a workman may take the work therefrom knowing that the number of pieces in it will be exactly twenty-five.

The advantage of the resiliency of the spring d^5 to the stops on the ring D will now be apparent as the cylinder b rotating under the torque of the spring e^2 will attain considerable velocity and were the ring D rigidly supported it will be considerably jarred by the impact with the stops thereof. The lever f^2 preventing the movement of the ratchet wheel when the press does not print insures that there will be the exact number of pieces of work determined on in the pockets when it turns. If desired a certain amount of tension may originally be placed in the spring in order to increase the torque which it will exert and this may be adjusted by means of the holes e^4 provided in the ratchet wheel.

It will thus be seen that we have devised a machine which will quickly and accurately count the work as it comes from the printing press or other kind of machine. While particularly adapted for use in connection with printing presses yet it is quite apparent that it may be equally well used with any class of automatic machines delivering the work in large quantities.

The mechanism shown would of necessity have to be varied somewhat to correspond with different classes of automatic machines with which it could be used but all these would fall within the scope of mechanical skill and as such would be covered by our invention.

What we claim as our invention is:—

1. In an automatic counter the combination with a spring actuated shaft, receiving pockets carried thereby, of means normally restraining the rotation of said shaft, and means for periodically releasing said restraining means and allowing the shaft to rotate a predetermined amount as and for the purpose specified.

2. In an automatic counter in combination a shaft, receiving pockets carried thereby, an operating spring secured thereto,

means operated from the movement of the producing machine for winding said spring, means for normally preventing the rotation of the shaft by the spring and means for releasing said means and allowing the shaft to be rotated by the spring a predetermined amount as and for the purpose specified.

3. In an automatic counter in combination a rotatably supported shaft, receiving pockets carried thereby, a ratchet wheel loosely supported thereon, an arm freely supported on said shaft, a pawl pivoted to said arm engaging said ratchet teeth, a second independently pivoted pawl also engaging the teeth of said ratchet wheel, means operated by the producing machine for moving said arm at each operation thereof, a spring secured to said shaft, a ratchet wheel which is wound by the movement of the latter, means for normally preventing the rotation of the shaft by the spring and means for releasing said means and allowing the shaft to be rotated by the spring for a predetermined amount as and for the purpose specified.

4. In an automatic counter in combination a rotatably supported shaft, receiving pockets carried thereby, a ratchet wheel loosely supported thereon, an arm freely supported on said shaft, a pawl pivoted to said arm engaging said ratchet teeth, a second independently pivoted pawl also engaging the teeth of said ratchet wheel, means operated by the producing machine for moving said arm at each operation thereof, a spring secured to said shaft, a ratchet wheel which is wound by the movement of the latter, means for normally preventing the rotation of the shaft by the spring, means for releasing said means and allowing the shaft to be rotated by the spring for a predetermined amount, and means for withdrawing the first pawl from in contact with the teeth of the ratchet wheel whenever the printing press fails to print as and for the purpose specified.

5. In an automatic counter in combination a shaft receiving pockets carried thereby, a ratchet wheel loosely supported thereon, a spring extending between said shaft and ratchet wheel adapted to be wound up by the rotation of the latter, means operated by the operation of the producing machine for rotating said ratchet wheel, means for normally preventing the rotation of said shaft, and means for withdrawing said means and allowing the shaft to rotate under the action of the spring for a portion of its revolution as and for the purpose specified.

6. In an automatic counter in combination a shaft, receiving pockets carried thereby, a ratchet wheel loosely supported thereon, a spring extending between said shaft and ratchet wheel adapted to be wound up by the rotation of the latter, means operated by the operation of the producing machine for rotating said ratchet wheel, means for normally preventing the rotation of said shaft and means operated by said ratchet wheel in its rotation for removing said preventing means and allowing the shaft to rotate under the action of the spring for a portion of its revolution as and for the purpose specified.

7. In an automatic counter in combination a rotatably supported shaft, an operating spring secured thereto, means for normally preventing the rotation thereof, means operated by the operation of the printing press for winding said spring and means for intermittently removing the means for preventing the rotation of said shaft and allowing said spring to rotate it as and for the purpose specified.

8. In an automatic counter in combination a rotatably supported shaft, an operating spring secured thereto, means for normally preventing the rotation thereof, means operated by the operation of the printing press for winding said spring, means for intermittently removing the means for preventing the rotation of said shaft and allowing said spring to rotate it and means for preventing the winding of said spring during the periods when the press fails to print as and for the purpose specified.

9. In an automatic counter in combination a rotatably supported shaft, a cylinder secured thereto, a casing inclosing the same, a spring-held dog protruding from the end of said cylinder, a plurality of stops adapted to be successively engaged by said dog in its normal position, means operated by the operation of the producing machine for disengaging said dog from in contact with said stops and means for rotating said shaft when said dog is disengaged from the stops as and for the purpose specified.

10. In an automatic counter the combination with a cylinder, a casing inclosing the same, a spring-held dog protruding from the end of the cylinder, a plurality of stops adapted to be successively engaged by said dog, a cam adapted to co-act with said dog to release the same, from engagement with said stops, and means for bringing said cam in contact with said dog as and for the purpose specified.

11. In an automatic counter in combination a rotatably supported shaft, a plurality of receiving pockets carried thereby, a cylinder carried thereby, a spring-held dog protruding from the end thereof, a plurality of stops non-rotatably supported adapted to be successively engaged by said dog, a ratchet wheel loosely supported on said shaft, means operated by the operation of the producing machine for rotating said ratchet wheel, a side cam on said ratchet wheel adapted to

co-act with said dog to release the same from in contact with said stops, and means for rotating said shaft when said dog has been released from in contact with said stops as and for the purpose specified.

12. In an automatic counter in combination a rotatably supported shaft, a plurality of receiving pockets carried thereby, a cylinder carried thereby, a spring-held dog protruding from the end thereof, a plurality of stops non-rotatably supported adapted to be successively engaged by said dog, a ratchet wheel loosely supported on said shaft, means operated by the operation of the producing machine for rotating said ratchet wheel, a side cam on said ratchet wheel adapted to co-act with said dog to release the same from in contact with said stops, and a spring connecting said ratchet wheel and shaft adapted to rotate the latter when the dog has been withdrawn from in contact with the stop as and for the purpose specified.

13. In an automatic counter in combination a rotatably supported shaft, a plurality of receiving pockets carried thereby, a cylinder carried thereby, a casing inclosing the same, a spring-held dog protruding from the surface of said cylinder, a ring abutting the end of said cylinder, a plurality of stops formed integral with the inner circumference thereof adapted to be successively engaged by said dog, a ratchet wheel loosely supported on said shaft, means for rotating the same operated by the operation of the producing machine, a side cam formed integral therewith and adapted to co-act with said dog to release the same from contact with said stops, a spring extending between said ratchet wheel and shaft and adapted to rotate the latter when said dog has been released from contact with the stop as and for the purpose specified.

14. In an automatic counter in combination a rotatably supported shaft, a plurality of receiving pockets carried thereby, a cylinder carried thereby, a casing inclosing the same, a spring-held dog secured in a recess in said cylinder and protruding from the end face thereof, a ring secured in said casing and abutting the end of said cylinder, a plurality of stops formed integral with the inner circumference thereof and adapted to be successively engaged by said dog, resilient means for holding said ring from rotation, a ratchet wheel, an arm loosely supported on said shaft, a pawl pivoted thereto and engaging the teeth of said ratchet wheel, means for communicating a reciprocating movement to said arm, a second pawl pivoted to the casing and engaging the teeth of said ratchet wheel, a side cam formed integral with said ratchet wheel and adapted to co-act with said dog to withdraw the same from contact with the stops, a helical spring having one end thereof connected to the ratchet wheel and the other to said cylinder and adapted to rotate said cylinder and shaft when said dog is released from in contact with said stops as and for the purpose specified.

Signed at Ottawa, in the Province of Ontario, this 22nd day of November, 1905.

JOHN MUNRO.
ADAM GERARD.

In the presence of—
RUSSEL S. SMART,
JOHN G. FOSTER.