

(No Model.)

S. M. BALZER.

REGISTER FOR COUNTING OPERATIONS OF MACHINES.

No. 545,034.

Patented Aug. 20, 1895.

FIG. 1.

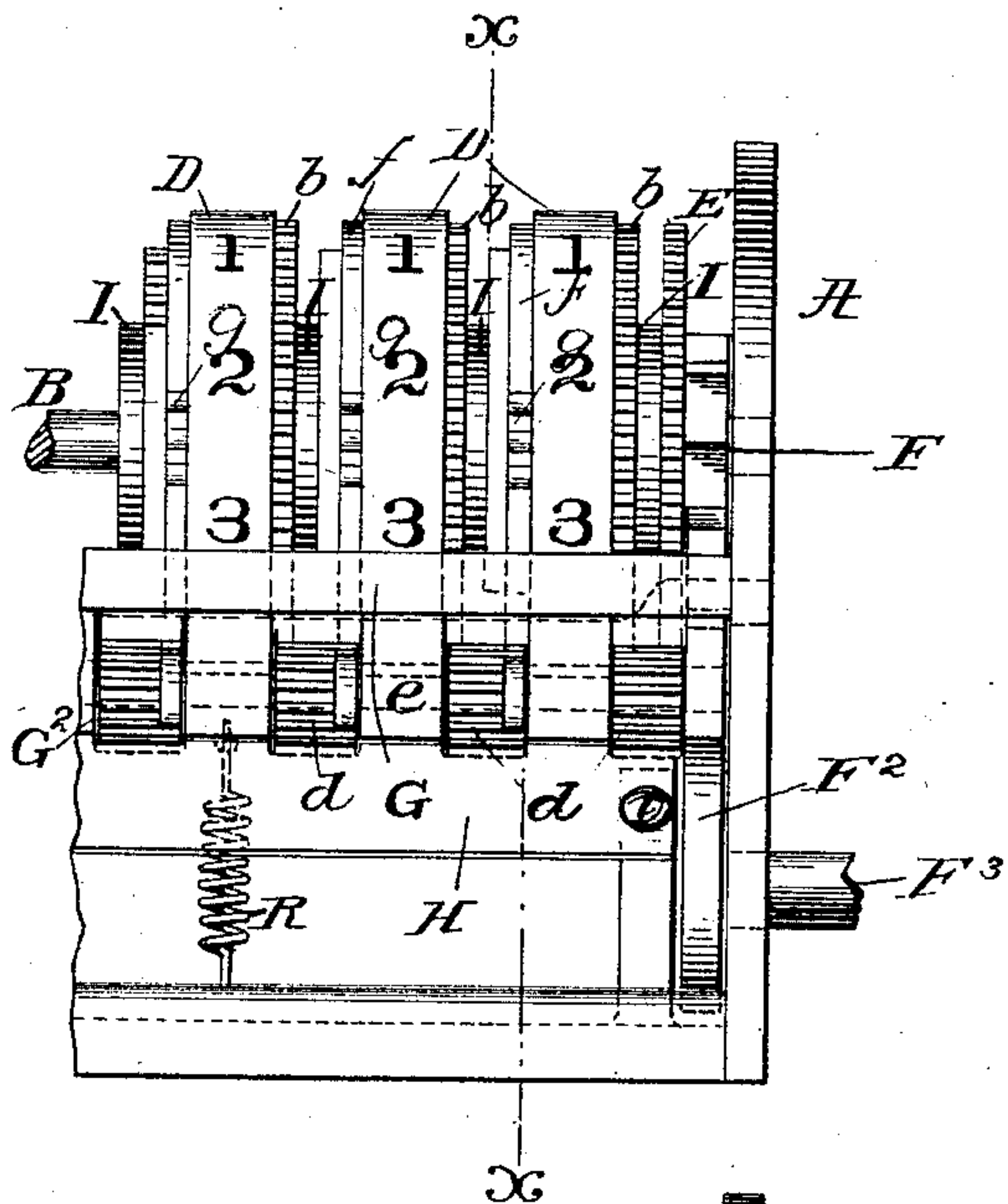


FIG. 2.

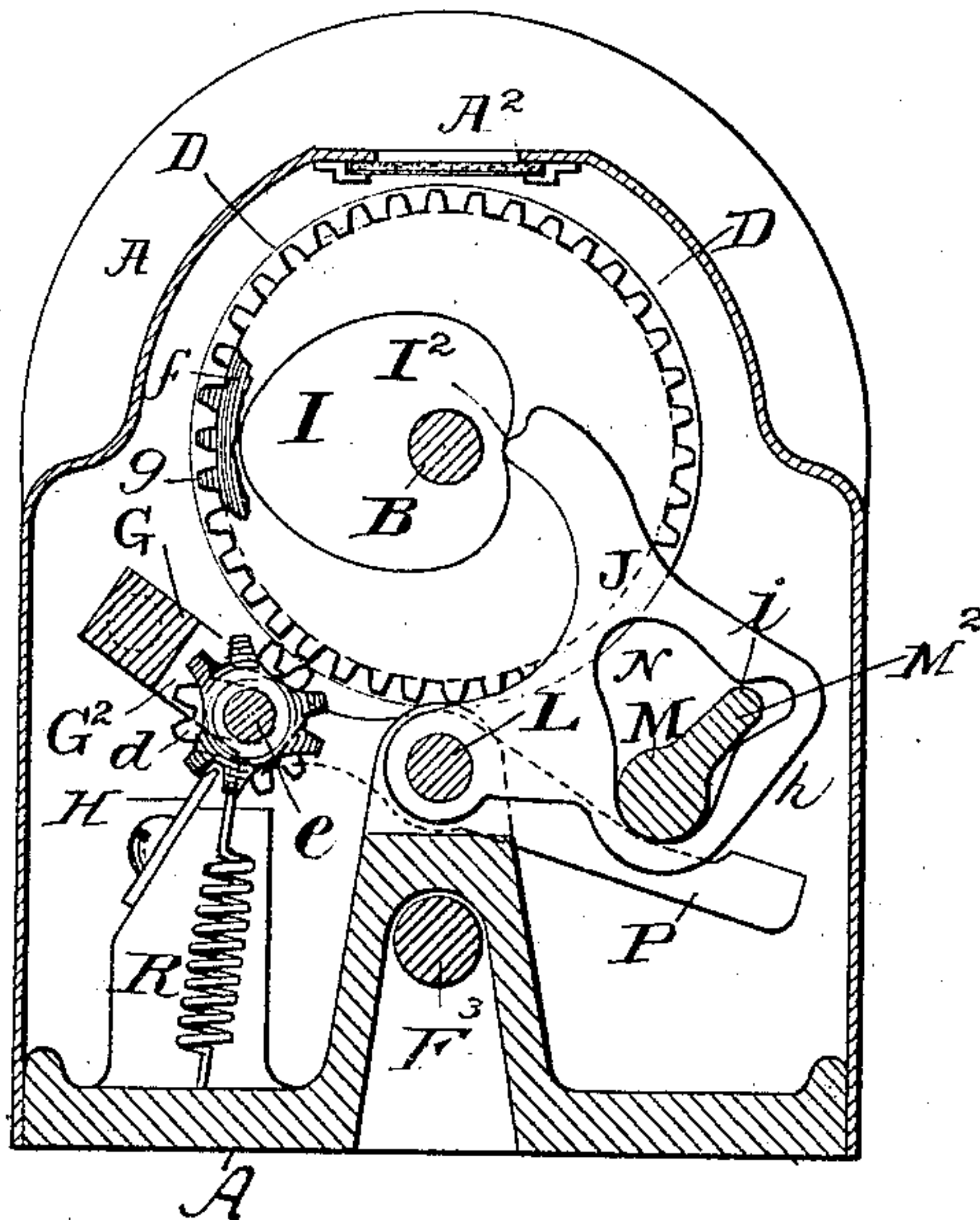


FIG. 3.

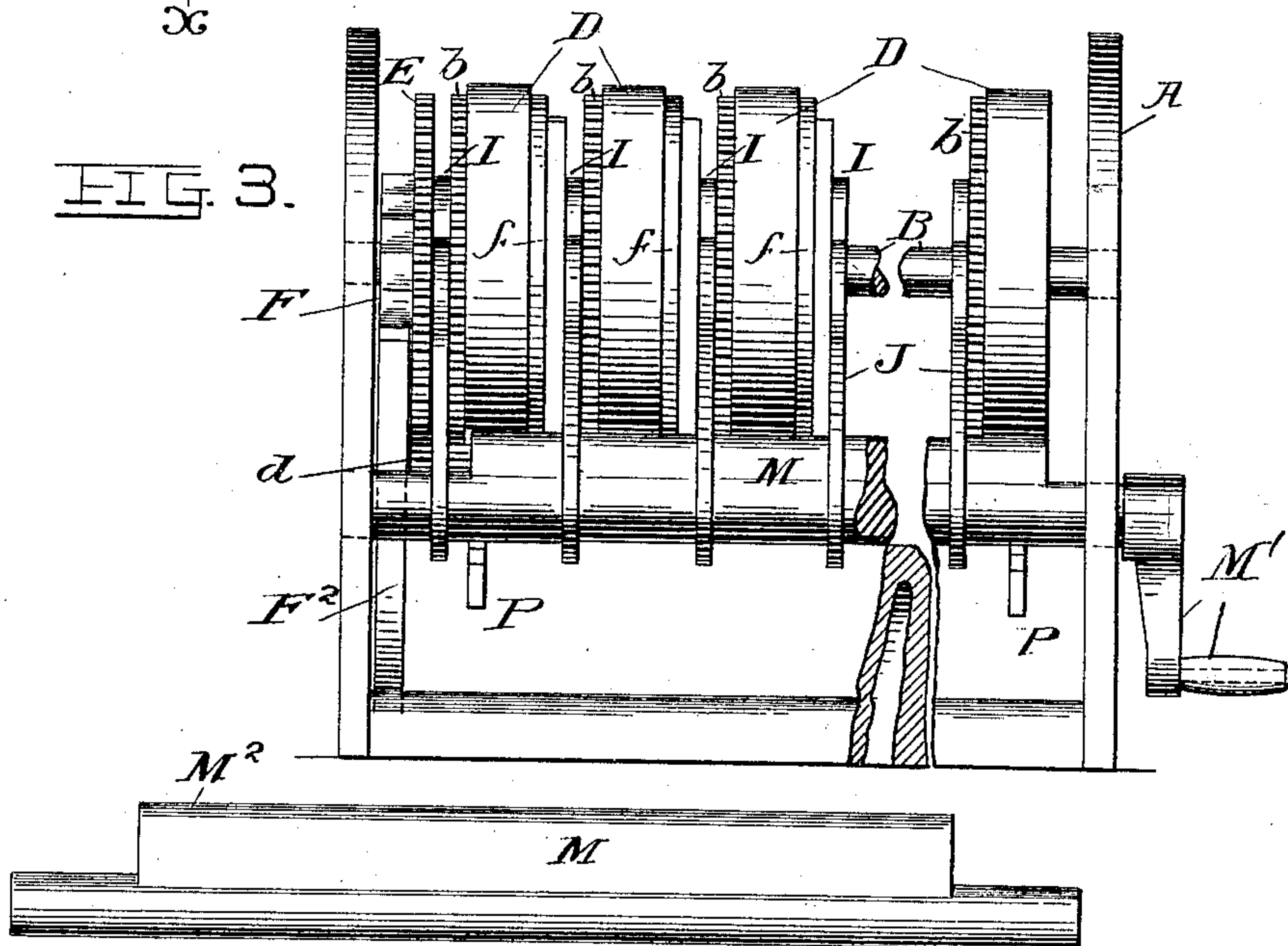
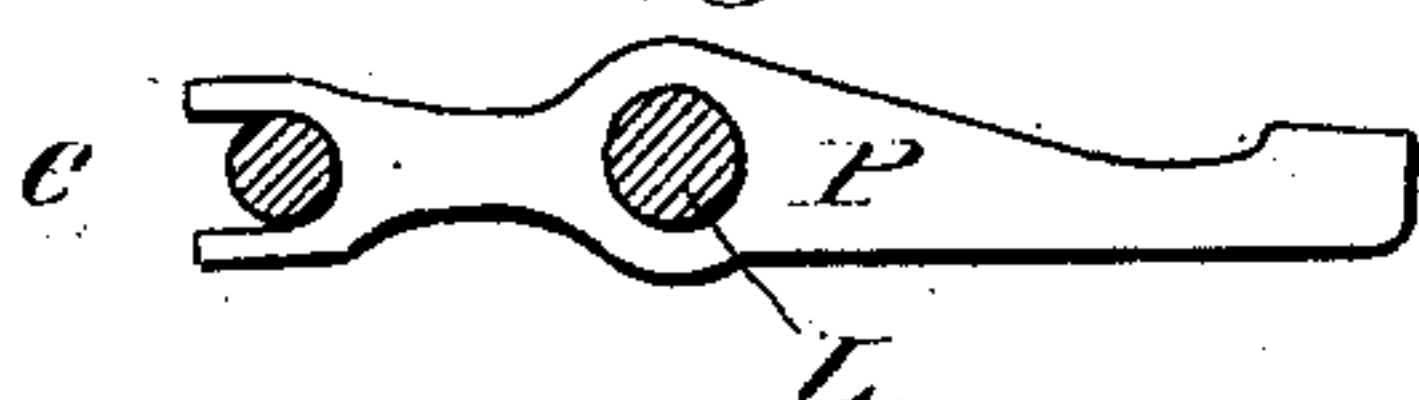


FIG. 4.

FIG. 5.



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REGISTER FOR COUNTING OPERATIONS OF MACHINES.

SPECIFICATION forming part of Letters Patent No. 545,034, dated August 20, 1895.

Application filed March 3, 1893. Serial No. 464,533. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN M. BALZER, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Registers to Count the Operations of Mechanism, of which the following is a specification.

My invention relates to that class of registers or counting devices wherein a series of rotative disks or drums are provided on their peripheries with numerals for indicating the number of motions of a shaft or other moving part.

The principal object of this invention is to provide means to reset or return all the number-disks to zero, or the normal position, positively and accurately at any time in which-ever positions the respective disks may be.

The invention consists in the novel details of improvement and the combinations of parts that will be more fully hereinafter set forth, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a side elevation of a portion of a register embodying my improvements, part of the casing being removed. Fig. 2 is a vertical cross-section thereof on the plane of the line xx in Fig. 1. Fig. 3 is a side elevation, partly broken away, of the register, looking from the side opposite that shown in Fig. 1, part of the casing being removed. Fig. 4 is a face view of an eccentric-shaft more fully hereinafter described; and Fig. 5 is a side view of lever P, showing its forked end for engagement with shaft e .

In the accompanying drawings, the letter A indicates a suitable casing provided with a sight-opening A^2 , arranged as found most desirable. In the casing A is hung a shaft B, upon which are mounted a number of counting or indicating disks or drums D, that are provided on their peripheries with numerals running from one to nine, with the cipher (0) also, only three numerals on each disk being shown in Fig. 1 and none on Fig. 3 for convenience of illustration. The disks D are to be turned consecutively to count the motions of a shaft or other moving part, and for this purpose each disk is provided with a

gear b , that respectively meshes with pinions d , hung on a shaft e . On the side of the disks D opposite to the gear b are rims or the like f , having teeth g to mesh with the sides of the pinions d , that are partly cut away, as in Fig. 2. This arrangement is such that while the cut-away part of pinion d bears on the rim f the pinion is kept from turning, but when the teeth g engage said pinion the latter will be turned slightly to turn the next disk D, by means of its gears b , a distance proportionate to the space between two of its numerals. For a more full and detailed description of the construction and operation of these gears, &c., I refer to United States Patent No. 489,703, issued to me January 10, 1893. Of course other desired means or modifications of the above parts can be used, if desired.

The disk D on the right in Fig. 1 is the units-disk, and its corresponding pinion d is full-faced—that is to say, not cut away for part of its face as before described—and it meshes with a gear-wheel E, loose on the shaft B and having the same diameter and number of teeth as the gear b , whereby the disk D next to the wheel E will be turned uniformly with the wheel E. The wheel E is turned by a ratchet-wheel F, rigid therewith and engaged by a pallet or operating-pawl F^2 , operated by a shaft F^3 or other moving part, and for a fuller description of this pallet or pawl I refer to the patent above mentioned. It is designed that the disks D may be reset to zero or the normal position when desired, and to permit this the pinions d must be disengaged from the gears b , and for this purpose the shaft e , that carries said pinions, is supported by a frame or the like G, that is pivotally carried by the casing A. The frame G is provided with recesses G^2 to receive the pinions d , to keep them from lateral movement.

H is a bar carried by the casing A, parallel to frame G, and adapted to engage the pinions d when they are disengaged from gears b , so that said pinions will be retained in position relative to said gears to be properly re-engaged therewith.

The disks D are arranged to be turned independently to reset them when disengaged from the pinions d , and for this purpose cams I (shown in Fig. 2 in the form of a heart)

are secured to said disks. (See Fig. 1.) The cams I are to be operated upon by levers J to turn said cams and thereby bring the disks D to zero. The levers J are hung on a shaft L, supported in the casing A, Fig. 2, and are operated by an eccentric-rod M, that passes through an opening N in each lever J and is hung in the casing A. The rod M is shown in detail in Fig. 4 and is provided at one part with a suitable handle M', by which it can be turned to operate the levers J. The openings N in the levers J are preferably of the shape shown in Fig. 2, having wearing-faces *h* and *i*, with a space between them sufficient to allow a limited free motion of the eccentric part M² of the rod M, whereby each lever can be given a slight individual motion to insure that the cams I will all be turned sufficiently far to receive the lever J in the recess I², which is so located with regard to the zero on the disks D that the zero will show at the opening A² when lever J is in recess I².

P are levers (one or more) hung on the shaft L and lying at one part against the under side of the rod M, and being forked at the opposite end to straddle the shaft *e* (as in dotted lines, Fig. 2, or otherwise connected with the latter, as may be desired) to swing the frame G to engage and disengage the pinions *d* from the gears *b* and E. A spring R, shown connected to the frame G and the casing A, tends to keep the levers P against the rod M and to draw down the frame G at the proper moment.

The operation is as follows: Fig. 2 shows the disks D as having been brought to zero by the levers J, the pinions *d* being disengaged from gears *b* and E. When desired to permit the device to count or register, the rod M will be turned to cause its part M² to bear on the faces *h* of levers J, whereupon the latter will be turned to carry them away from the cams I. Part M² of rod M will now bear on levers P and depress them at one end, thereby causing their opposite ends to lift frame G and pinions *d* until the latter mesh with gear *b* and wheel E. The latter wheel being now turned will turn the units-disk D, which for each rotation will turn the next or tens disk one space, and so on throughout the series of disks.

To reset the disks, which can be done at any moment in whichever positions they may happen to be, the rod M is turned to the left in Fig. 2, thus first releasing levers P to the influence of spring R, which draws the pinions *d* away from the gears *b* and E, thereby giving the disks D free movement. Part M²

of rod M now bears on the faces *i* of the levers J, causing said levers to impinge on the cams I, thus turning them and the disks D until the recesses I² are reached, whereupon the disks D will have been brought to the desired position.

The device is simple in construction and can be readily operated, as by merely turning the handle M' the various operations of releasing the disks D and resetting them, or of re-engaging the gears and pinions, can be effected. A feature of the invention is that all the disks D are reset simultaneously with but one intelligent operation—that of turning but one part by hand.

Having now described my invention, what I claim is—

1. The combination of a disk or drum, gear connected therewith, a pinion, a frame carrying said pinion, and a lever for swinging said frame, with a cam to turn said disk or drum, a lever to operate the cam, and means for simultaneously and conjointly moving said levers to disengage the gear and pinion and turn said cam, substantially as described.

2. The combination of a disk or drum and means for turning it, with a cam, a lever J to turn said cam, said lever having an opening N, and faces *h* and *i*, and with a rod M having eccentric part M², entering said opening N, and arranged to operate said lever, substantially as described.

3. The combination of a shaft, a series of disks or drums hung loosely thereon, each disk being provided with a gear *b* and toothed rims *f* connected with certain of said disks, laterally movable pinions *d*, a gear wheel E independent of said disks and a pinion meshing with said gear wheel and with the gear *b* on an adjoining disk, the other pinions being arranged to mesh with the gear *b* and the teeth on rims *f* carried by the other disks, with a swinging frame carrying said pinions, a lever for operating said frame, cams carried by said disks, levers for operating said cams, and a rod or actuating means for operating the lever to disengage the pinions from the gears, and for also operating the cam-operating-levers to turn the disks to re-set them, substantially as described.

Signed at New York, in the county of New York and State of New York, this 16th day of February, A. D. 1893.

STEPHEN M. BALZER.

Witnesses:

T. F. BOURNE,
M. V. BIDGOOD.