

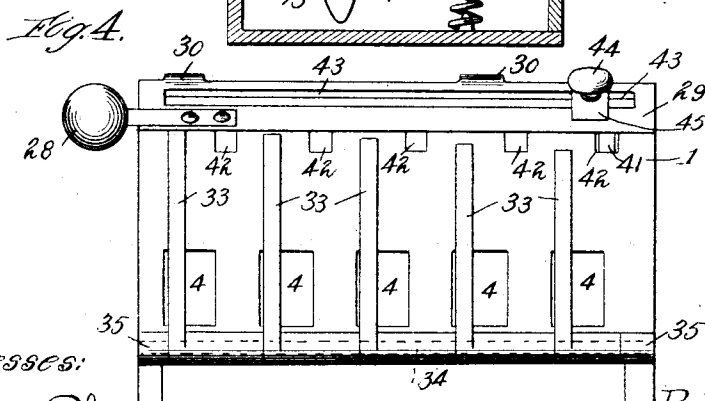
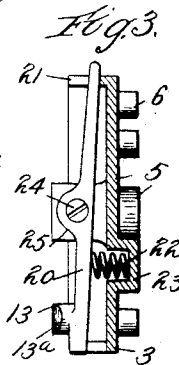
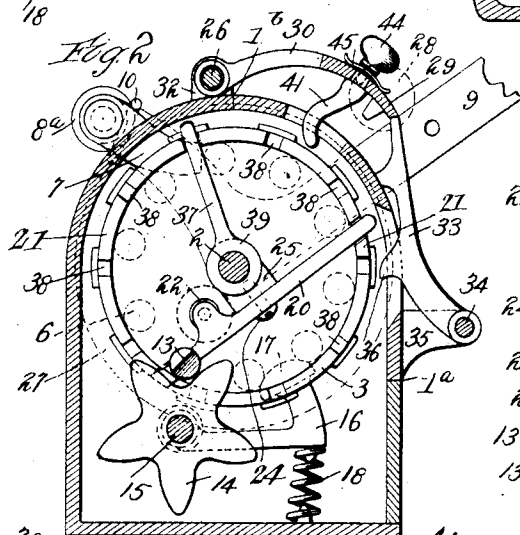
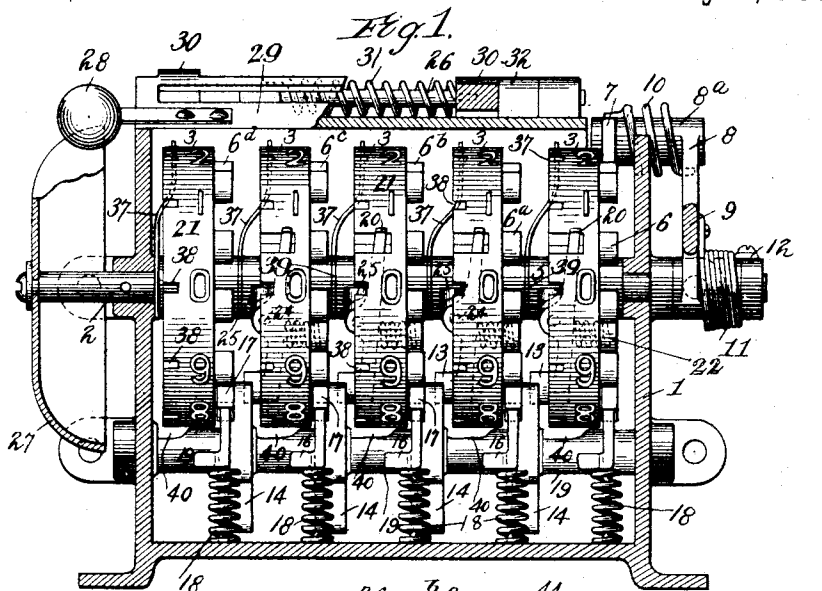
(No Model.)

R. MIEHLE.

REGISTER ALARMING ON PREDETERMINED COUNT.

No. 538,973.

Patented May 7, 1895.



Witnesses:

Wm. M. Rheem.
Wm. F. Manning

by

Robt. Miehle.
Ellis & Hopkins Attys.

UNITED STATES PATENT OFFICE.

ROBERT MIEHLE, OF CHICAGO, ILLINOIS.

REGISTER ALARMING ON PREDETERMINED COUNT.

SPECIFICATION forming part of Letters Patent No. 538,973, dated May 7, 1895.

Application filed May 31, 1894. Serial No. 513,009. (No model.)

To all whom it may concern:

Be it known that I, ROBERT MIEHLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Counting-Registers, of which the following is a full, clear, and exact specification.

My invention relates to that class of registers or counters for indicating the impressions of printing presses, or the number of operations or movements of other forms of machinery or its parts.

One of the objects of my invention is to provide counting registers with an improved alarm mechanism which will automatically sound when the predetermined number is reached; and a further object in this respect is to provide improved means for causing the alarm to repeat in the event the operation of the machinery to which the register is attached, continues after the alarm has been once sounded.

Another object of my invention is to simplify devices of this character and to reduce the friction therein by reducing the number of parts and avoiding frictional contact between any of the parts excepting those which are operating for the purpose of setting the next digit or cipher in the number to be registered.

With these ends in view my invention consists in certain features of novelty hereinafter more fully described with reference to the accompanying drawings and particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of my improved apparatus, showing the casing and certain other parts in vertical longitudinal section. Fig. 2 is a transverse sectional view looking toward the right in Fig. 1, the section being taken in a plane passing between the end of the casing and the first disk on the left. Fig. 3 is a detail view of one of the disks, hereinafter described, shown in axial section; and Fig. 4 is a plan view of the casing and striker for the alarm.

The same signs of reference indicate the same or like parts throughout the several views.

The operating parts are preferably arranged in an inclosing case 1 which also serves

as a support for the main shaft or pintle 2 whose ends are secured against rotation in the ends of the casing and protrude therefrom as shown in Fig. 1. Arranged loosely on this shaft within the casing are a number of disks 3, each of which represents the nine digits and one cipher, and which for the sake of convenience, I will term the "digit disks." Any number of these disks may be employed, according to the capacity of the machine desired; and they are preferably provided around their peripheries with a widened band or flange upon which the nine digits and cipher are indicated, so that by forming openings 4 in the casing opposite each row of digits, the progress of the registration may be observed.

The disks 3 are independent of each other and rotate loosely upon the shaft 2, which as stated, is fixed against rotation and simply serves as a support; and each of the disks is provided with an extended hub 5 which holds the disks at the proper distance asunder. On one side of each of the disks is a series of teeth or lugs 6, 6^a, 6^b, 6^c, 6^d which lugs are ten in number and correspond to the digits and cipher on the disk. With these lugs 6 on the units disk engages a pawl or dog 7, which rests upon one of the lugs while engaging with the other as shown more clearly in Fig. 2, and which is actuated to impart to the disk an intermittent rotation equal at each stroke to the distance between the characters on the disk, by an arm 8 which is one arm of a bell crank lever to whose longer arm 9 may be secured or attached the moving part of the machinery whose operation it is desired to register. The arm 8 of this bell crank is provided with a laterally projecting boss 8^a to which the dog 7 is pivoted so as to vibrate in the plane of rotation of the lugs 6 while the bell-crank itself may be situated on the exterior of the casing and be journaled on one of the protruding ends of the pintle 2 as shown in Fig. 1, the boss 8^a being wrapped with a spring 10 which presses the dog normally into engagement with the lugs 6, and the hub of the bell-crank lever being wrapped with a spring 11 which is secured at one end by a screw 12 to the pintle 2 and at its other end to the bell-crank so as to return the lever irrespective of the movement of the ma-

chinery, to its normal position for imparting further rotation to the disk.

On the other side of each of the disks 3, excepting the last one of the series, is arranged a lug 13 and arranged in each of the spaces between the disks preferably at their lower sides, is a spur wheel 14 which is of sufficient width to be engaged by the lug 13 and to also engage with the series of teeth or lugs 6^a on the opposite disk, so that a complete rotation of each of the disks will bring its lug 13 into engagement with one of the spurs of the spur wheel and thus impart a partial rotation to the opposite or next disk in the series so as to bring a higher number or digit on the latter disk in line with the openings 4 in the casing.

The spur wheels 14 are mounted upon a counter shaft or pintle 15 which is rigidly fixed in the ends of the casing 1, the spur wheels being loose upon the shaft and independent of each other, so that the rotation of one cannot affect the other or produce any friction with the other excepting through the intermediary of the disks and their lugs.

It will be seen that by making the disks independent of the pintle 2 and providing the independent counter-shaft or pintle 15 with the independent spur wheels 14 thereon, I avoid the frictional contact between all the parts excepting those which are operating to effect the adjustment of the next digit in the number to be registered, that is to say, the first nine strokes of the machinery do not produce frictional contact with any of the parts excepting the first disk of the series and the parts with which it immediately engages, and when the tenth or additional stroke is made the only additional friction is that which results from the engagement with the lug 13 with the spur wheel and the spur wheel with the series of lugs 6^a on the next disk, including of course the friction of such disk on the pintle 2.

In order that accidental movement of the disk may be avoided I provide the pintle 15 with a number of arms 16 each having a friction button 17 having a rounded upper surface adapted to engage with the lugs 6, 6^a, 6^b, &c., on the digit disks as the latter rotate, the arms 16 being normally supported by springs 18 so that a slight pressure in addition to that ordinarily required for rotating the disks will be required for causing the lugs to pass the friction buttons.

Each of the arms 16 is provided with an elongated hub 19 through which the pintle 15 passes and which extends between the spur wheels 14 and holds them at the proper distance asunder.

In order that the disks may be rotated independently of each other when it is desired to turn them all back to zero or set them in any other necessary position, I mount each of the lugs 13 so that it may be disengaged at will from the spur wheel 14. This may be conveniently and best accomplished by form-

ing each of the lugs 13 with or securing it upon a pivoted bar or lever 20 whose end protrudes through a slot 21 in the flange of the disk so as to be engaged by the finger of the operator for disengaging the lug 13 from the spur wheel, the lug 13 being held normally in the plane of rotation of the spur wheel by a suitable cushion or spring 22 seated in a socket 23 in the disk and bearing under one end of the lever 20; the lever 20 being pivoted at 24 to a flattened boss 25 formed on the side of each of the hubs 5. If desired however, the automatic disengagement of the lug 13 with the spur wheel 14 may be effected by beveling one side of the lug 13 as shown at 13^a so that by rotating the disk backward the beveled end will come in contact with the spurs of the wheel 14 and cause the deflection of the lug 13.

The upper side of the casing 1 is preferably provided with a hinged portion open between the points 1^a, 1^b, and being hinged on a rod 26, so that convenient access to the interior mechanism may be had.

Arranged on the other protruding end of the pintle 2 or upon any other convenient part of the device is a bell or alarm 27, and located above this alarm is a striker 28 which is provided with an arm 29 extending longitudinally over the casing and being itself provided with arms 30 which are hinged or pivoted on the rod 26, so that when the arm 29 is raised and lowered the striker 28 will sound the alarm. The operation of the striker may be rendered more effective by providing it at some suitable point with a spring for accelerating gravity. This may be best accomplished by winding a coil spring 31 upon the rod 26 and securing it at one end to one of the arms 30 and at its other end to one of the ears 32 through which the rod 26 passes, in the ordinary manner. The striker is held normally aloof from the gong or bell by any one of a series of pivoted arms or supports 33 which are journaled at their lower ends upon a rod or pintle 34 mounted in suitable ears 35 of the casing. These arms or supports 33 when in their normal position rest against the casing as shown in Fig. 2, so that the lower edge of the arm 29 will rest upon the upper end of one of the arms 33; and one of these arms 33 is arranged directly opposite each of the digit disks, and is provided with a suitable projection or bevel 36 which enters the casing through the opening 4 and is located in the line of movement of some suitable projection carried by each of the disks so that the rotation of the disk will bring such projection thereon into engagement with the projection 36 and force the arm 33 outward from under the edge of the arm 29; thus permitting the latter to fall and cause the striker to sound the alarm. The said projection on the disk for effecting this disengagement of the striker may be best provided by arranging a thin strip 37 adjacent to each of the disks and permitting its end to protrude through any one of a series of notches or recesses 38 formed in the edge

of the flange on each of the disks, such notches corresponding in number and arrangement with the digits and ciphers on the disks. These strips 37 are preferably constructed of spring metal or material and their inner ends are provided with eyes 39 through which the pintle 2 passes, such inner ends being held between the hubs 5 of the disks as shown in Fig. 1. By this arrangement it will be seen that the elasticity of the spring strip 37 will hold it in any one of the notches 38 in which it may be placed and yet it may be readily removed and adjusted in another one. The hubs 19 immediately in line of travel of the protruding ends of these projections 37 and also in the line of travel of the protruding ends of the levers 20 are cut away as shown at 40 for the purpose of allowing these protruding ends to pass.

In order that the alarm may not be sounded until the last digit of the predetermined number which it is desired to register or count off, is set opposite its opening 4 in the casing, I make the arms 33 of graduated length as shown in Fig. 4; or in other words I arrange the ends of the supports or arms 33 in a line extending at an angle to the edge of the arm 29 so that the arm 29 of the striker will rest upon one of them at a time. Thus it will be seen that should the striker arm be supported by the longest one of the arms 33 as shown in Fig. 4, the projections 37 on all of the disks save the last one of the series, will pass by each of the first four arms and simply deflect them outward without interfering with the support of the striker arm, each of said first four arms 33 falling back into position as soon as the projection 37 has passed, if it should pass; but when the last digit of the predetermined number to be registered has been set opposite the last one of the openings 4 the projection 37 on that disk will be in engagement with the projection 36 on the last arm 33, and each of the projections 37 on each of the other disks will at the same time be in engagement with each of the projections 36 on each of the other arms 33. Thus all of the arms 33 will be held outward from under the edge of the striker arm 29 and the striker will be permitted to descend upon the gong. It is understood of course that in the operation of my device the projections 37 are always set in the notch 38 which corresponds with the digit or cipher which will be opposite the opening 4 when the predetermined number has been registered. This variation in the lengths of the arms 33 however is only desirable when it is necessary to register numbers in which all the figures save the first one are not ciphers; because it is readily seen that should it be desired to register three hundred for instance, and have the alarm sound when the three hundred is reached, it would only be necessary to throw the arms 33 outward or turn them downward on the rod 34, out of the way so that when the last digit in the number has reached the single arm upon which the

striker arm 29 is supported and which corresponds in location with such digit, it will throw such arm outward and permit the striker to descend.

In order that the alarm may be repeated in the event the first stroke should not be heard and the machinery should continue in operation thereafter, I provide the striker arm 29 with a depending finger 41 which extends downward through any one of a number of apertures 42 formed in the casing; such apertures being directly over the lugs 6, 6^a, 6^b, &c., on the disks. This finger is therefore adjustable longitudinally of the striker arm, and such adjustability may be conveniently effected by providing the striker arm 29 with a slot 43 through which is inserted the stem of a thumb-piece 44 which is secured to the finger 41 and between which and the arm 29 bears a blade spring 45 for holding the finger against accidental movement. The finger 41 is of such a length as to come into contact with the lugs 6, 6^a, 6^b, &c., on the disk and it is so curved that the engagement of the lugs with it will force it upward and consequently raise the striker, and when one lug passes it will suddenly descend, permitting the striker to sound the alarm; thus causing the alarm to repeat at each stroke of the part of the machinery to which the arm 9 is connected.

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

1. In a counting register, the combination with the digit disks and means for actuating them, of projections adapted to rotate with said disks, an alarm, a striker for said alarm, and independently deflectable supports for said striker arranged to be struck by said projections for releasing the striker, substantially as set forth.

2. In a counting register, the combination with the digit disks and means for actuating them, of projections adapted to rotate with said disks, an alarm, a striker for said alarm, having an arm, and independently deflectable supports for said striker arm arranged to be struck by said projections for releasing the striker, said supports corresponding in number and arrangement with said disks and their ends being arranged in a line extending at an angle to the edge of the striker arm, substantially as set forth.

3. In a counting register, the combination of the digit disks each having a number of notches or recesses equal to the numbers represented by it, a shiftable projection or trip for each of said disks adapted to be arranged in either of said notches or recesses, an alarm, a striker for sounding said alarm, and pivoted independently deflectable supports for said striker arranged opposite and adapted to be struck by said projections or trips, substantially as set forth.

4. In a counting register, the combination with a pintle and the digit disks thereon, each having a number of notches or recesses corre-

sponding in number and arrangement to the numbers represented by the disks, of spring strips sleeved upon said pintle between said disks and having their ends seated in and protruding from said notches, an alarm, a striker for said alarm, and a number of pivoted supports for said striker arranged opposite and adapted to be struck by the protruding ends of said strips respectively, substantially as set forth.

5. In a counting register, the combination with the digit disks each having a projection, and means for actuating said disks, of an alarm, the arm 29, a striker on said arm adapted to strike said alarm, the rod 26 to which said arm 29 is pivoted, a spring acting upon said arm 29, deflectable supports for holding said arm 29 aloof and being arranged in the line of movement of said projections on the digit disks respectively, substantially as set forth.

6. In a counting register, the combination with the digit disks having lugs or teeth, and means for actuating said disks, of an alarm, a striker for said alarm having a pivoted arm, a casing inclosing said disks and being provided with apertures registering with said lugs or teeth, an adjustable finger secured to said striker arm and adapted to protrude through said apertures into engagement with said lugs or teeth, means for holding said striker-arm aloof, and means for releasing said striker arm for sounding the alarm, substantially as set forth.

7. In a counting register, the combination with the digit disks having teeth or lugs and means for imparting movement to one of said disks, of spur wheels mounted between and adapted to engage the teeth or lugs of the disk on one side, and a lug on each of a number of said disks, arranged at the other side of each of said spur wheels and adapted to engage therewith for imparting the movement of the disks to the spur wheels, said second lugs being movable out of the path of the spurs of said spur wheels independently of

said disks, and means for holding said movable lugs normally in the path of the spurs of said spur wheels, substantially as set forth.

8. In a counting register, the combination with the digit disks having teeth or lugs thereon and means for imparting movement to one of said disks, of spur wheels mounted between said disks and adapted to engage with said teeth or lugs on one side, a pivoted lever secured to each of said disks and having a lug arranged to engage with each of said spur wheels on its other side, and a spring for holding said lug normally in engagement, substantially as set forth.

9. In a counting register, the combination with the digit disks having teeth or lugs thereon and means for imparting movement to one of said disks, of spur wheels mounted between said disks and adapted to engage said teeth or lugs on one side, the said disks being provided with broadened flanges having a notch or cavity therein, a pivoted lever carried by each of said disks and having one end protruding through said notch and the other end provided with a lug arranged to engage with the spur wheel adjacent to it, and a cushion for holding said lug normally in engagement, substantially as set forth.

10. In a counting register, the combination of the digit disks having lugs on one side thereof, a fixed pintle on which said disks are mounted, a counter shaft or pintle fixed against rotation, spur wheels mounted on said counter shaft and engaging with said lugs, cushioned arms 16 mounted on said counter shaft between said spur wheels and having the friction buttons 17 engaging with said lugs, lugs on said disks for imparting the movement thereof to the said sprocket wheels, and means for actuating one of said disks, substantially as set forth.

ROBERT MIEHLE.

Witnesses:

F. A. HOPKINS,
EDNA B. JOHNSON.