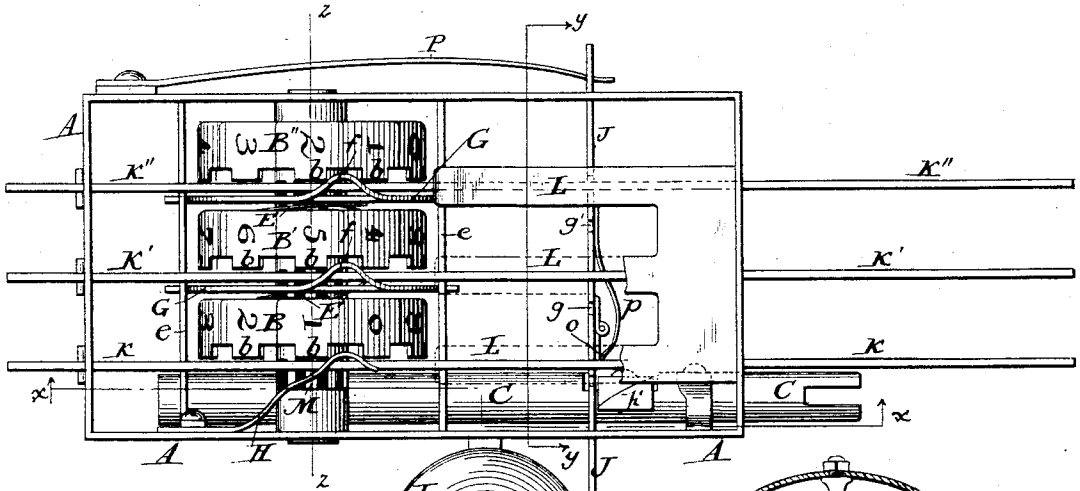
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COMBINED REGISTER AND ALARM.

No. 286,317. Patented Oct. 9, 1883.

Fig. 1



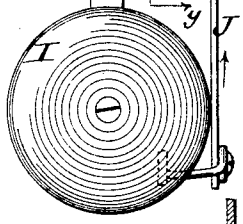


Fig. 3

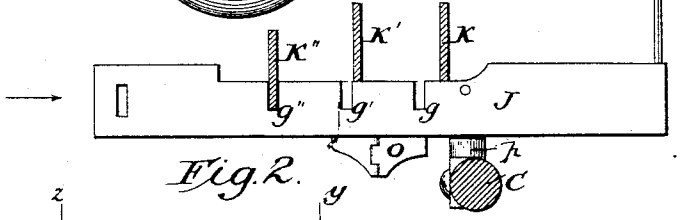
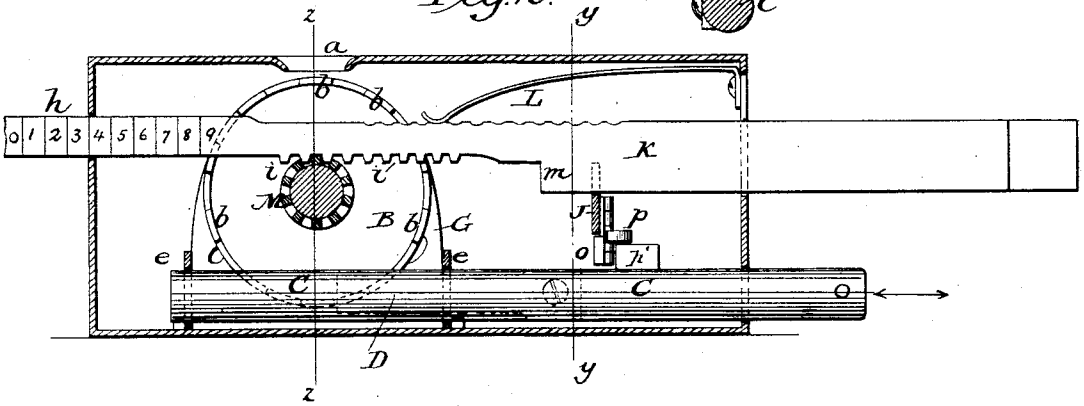


Fig. 2.



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Fig. 4.

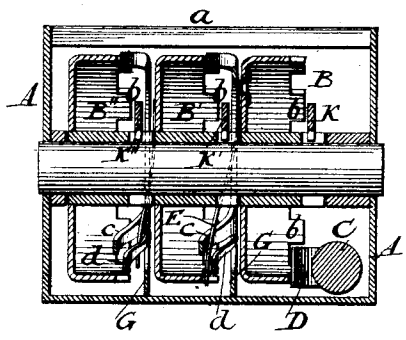


Fig. 7.

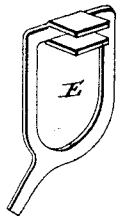


Fig. 5.

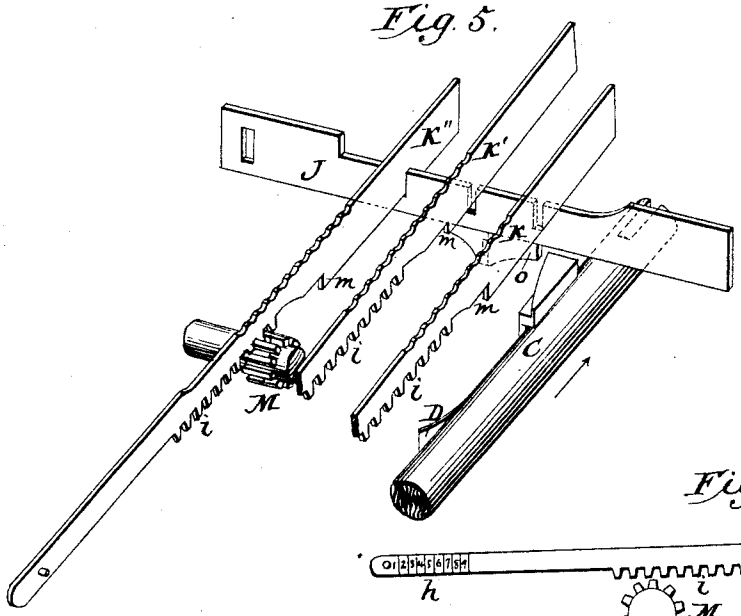


Fig. 8.

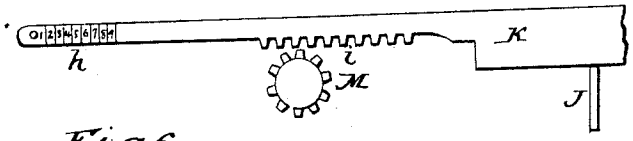
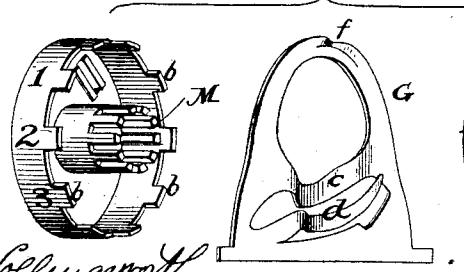


Fig 6.



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(Model.)

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Fig. 9.

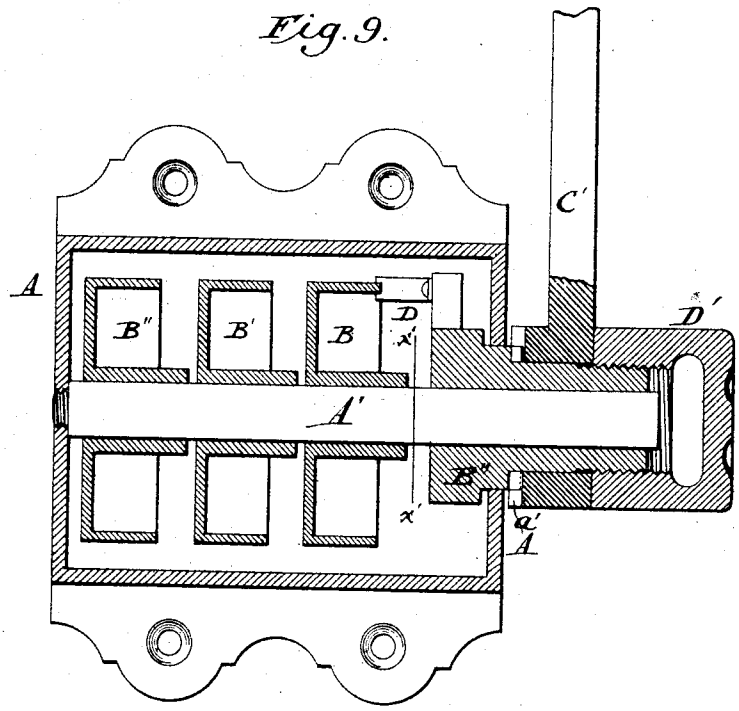
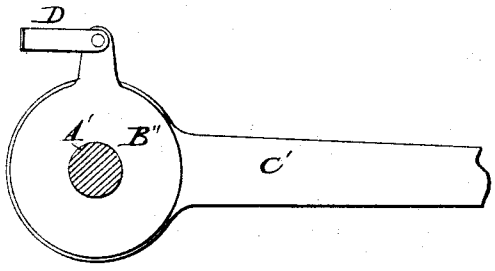


Fig. 10.



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UNITED STATES PATENT OFFICE.

JOHN G. LETTELIER, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF AND EDWIN E. PRATT, OF SAME PLACE.

COMBINED REGISTER AND ALARM.

SPECIFICATION forming part of Letters Patent No. 286,317, dated October 9, 1883.

Application filed December 27, 1882. (Model.)

To all whom it may concern:

Be it known that I, JOHN G. LETTELIER, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in a Combined Register and Alarm, of which the following is a specification.

The aim of my invention is to produce a simple, reliable, and inexpensive mechanism to register the number of movements made by a printing-press or other mechanism, and also to adapt the same to be set at will to give an alarm whenever a predetermined number of movements have been made.

To this end it consists in the peculiar construction and organization of elements hereinafter described in detail.

Referring to the accompanying drawings, Figure 1 represents a face view of my instrument, the covering-plate being removed to expose the internal parts. Fig. 2 represents a longitudinal section of the same on the line *x x*, Fig. 1. Fig. 3 represents a transverse section of the same on the line *y y*, Figs. 1 and 2. Fig. 4 is a transverse section on the line *z z*, Figs. 1 and 2. Fig. 5 is a perspective view showing the combination of slides by which the indicating mechanism is caused to control and actuate the alarm. Fig. 6 is a perspective view showing the form and relative arrangements of the indicator wheels or dials and the mechanism and pawls by which motion is communicated at the proper intervals from one wheel to the next. Fig. 7 is a perspective view of one of the dogs or pawls detached. Fig. 8 is a diagram illustrating the manner in which the alarm-controlling slides are held out of engagement with the operating-pinions on the register-wheels. Fig. 9 is a cross-section through my apparatus, showing a modified arrangement of the operating-dog. Fig. 10 is a section on the line *x x'*.

The counting or registering mechanism of my device consists of a series of concentric wheels or dials, each bearing the ten numerals, a reciprocating dog for imparting motion to the first or unit wheel, and intermediate dogs or pawls carried by the respective wheels, and arranged to operate in connection with switches in such manner that each wheel, in completing a revolution, is caused, through its dog, to move the next wheel in the series a distance sufficiently to bring the next succeeding number thereon into view.

It will be observed by one skilled in the art that in its general mode of action the mechanism bears a resemblance to others which have preceded it. My invention, so far as it relates to this part of the invention, consists in various details, which will be hereinafter described.

The second part of the apparatus consists of an alarm mechanism connected with and controlled by the register proper, this mechanism being of such character that it may be adjusted with respect to the register in such manner as to sound the alarm only when a predetermined number of movements have been registered. The improvement in this second part of the invention consists, more especially, in the peculiar arrangement of slides and operating-pinions, as will be hereinafter described.

Referring to the accompanying drawings, A represents a rigid rectangular frame designed to give support to the various operative parts of the mechanism.

B B′ B″ represent the register or indicator-wheels, arranged independently upon a common shaft, each wheel being a counterpart of the others, and having a broad face or periphery, upon and around which the ten numerals or ordinals are arranged at uniform distances apart. The three wheels, commencing with B, represent, respectively, units, tens, and hundreds.

The face of the instrument is provided with an opening, *a*, through which the registration may be read, this opening exposing but a single number on each wheel, as usual in this class of instruments. The wheels, which will be hereinafter described more in detail, are notched or indented at the periphery to form ten teeth, *b*, at the edge, these teeth being designed to engage with the devices by which the wheels are rotated and locked. The first or unit wheel, B, receives an intermittent motion from a reciprocating slide, C, which is provided with a pawl or dog, D, arranged to engage at each forward motion of the slide with one of the teeth of the said wheel. The result is that at each advance of the slide the unit-wheel is turned sufficiently to advance

the next number upon its face beneath the face-opening *a*.

For the purpose of imparting motion from the wheel B to the wheel B′, I attach to the back face of the first wheel a spring pawl or dog, E, as represented in Figs. 1, 4, 6, and 7. This pawl, formed of sheet metal and with one end inserted in an opening in the wheel, is arranged to spring outward away from the face of the wheel at the opposite end, so as to engage with the teeth of the next wheel, thus locking the two wheels together and causing the first to turn the second.

As it is desired to have the wheels connected but momentarily during each revolution, I introduce between the first and second wheels a device which I denominate a "switch," G, for throwing the pawl or dog E into and out of contact with the second wheel, B′. This switch consists, as plainly represented in Figs. 1, 4, and 6, of a sheet-metal plate having an open center to permit the passage of the main shaft, and having at its lower end two strips or tongues, *c* and *d*, punched outward laterally. The plate G is placed in position between the wheels B and B′, as shown in Figs. 1 and 4, and attached firmly at its lower end to cross-bars *e e*, as shown in Figs. 1, 2, and 4. Its position is such that at the instant the unit-wheel indicates ten the free end of its dog E will pass between the curved tongues *c* and *d*, and be thereby moved laterally away from the wheel B, so as to engage the teeth upon the second wheel B′. The lateral curvature of the switch-tongues *c* and *d* is such that the dog is retained in engagement with the second wheel until the latter has been advanced a sufficient distance to expose its next number, whereupon the dog E, which is meantime advanced between the switch-tongues *c* and *d*, is thrown backward thereby and disengaged from the second wheel, B′. The dog, being thus disengaged, rides against the face of the plate G, and is thus held out of contact with the second wheel until the first wheel completes another revolution, when the dog engages as described, and so on repeatedly, the engagement and disengagement of the dog being effected positively at each rotation of the first wheel. In this manner the second wheel, or wheel of tens, is caused to advance one number at each revolution of the unit-wheel.

For the purpose of transmitting motion from the second wheel, B′, to the third wheel, B″, I employ a dog and switch mechanism identical with that just described, locating the same, as shown, between the second and third wheels. This arrangement of switches and wheels may be multiplied indefinitely, according to the capacity of registration required.

For the purpose of preventing the wheels from being carried too far by the momentum, or of their being moved accidentally, each of the switch-plates G has at the upper edge a portion, *f*, pressed laterally therefrom, as shown in Fig. 6. The plates G are made of brass or equivalent material, and being fastened rigidly at the lower edges, as before explained, the upper edge is caused to spring to the left in such manner as to throw the projections *f* into engagement with the notched edges of the wheels, as shown in Figs. 1 and 4. It will thus be seen that each plate G serves not only as a switch device for throwing the dogs into and out of action, but also as a pawl to prevent the accidental movement of the wheels. It should be understood that the wheels, the plates G, and the dogs are each a counterpart of its fellow, so that but a single set of dies is necessary to the construction of the instrument.

The accidental movement of the first or unit wheel is prevented by means of a special spring, H, attached to the casing and bearing at one end in the edge of the wheel, as shown in Fig. 1

The above-described apparatus constitutes in itself a complete operative registering mechanism adapted to indicate the number of movements which may be imparted to the actuating-slide C. I will now proceed to describe the alarm mechanism connected therewith. This mechanism consists, essentially, of an alarm-bell, I, a reciprocating spring-actuated bar, J, provided with a striker to act upon the bell, and a series of slides, K, K′, and K″, operated by means of pinions attached to the respective indicator-wheels, and arranged to hold the striking-bar J out of action until a predetermined registration has been reached. The striking-bar J is mounted transversely in the body, or, in other words, in a line parallel with the axes of the register-wheel, and is urged toward the right by a strong spring, P. On the under side of the striking-bar there is a hinged dog, *o*, acted upon by a spring, *p*, and arranged to yield in one direction only. On the actuating-slide C there is an inclined face designed to act against the hinged dog. When the striking-bar is raised from the detent mechanism and is in its forward position, the incline will encounter the hinged dog at each forward movement of the slide C, and thereby force the striking-slide backward, after which it is released by the passage of the incline and permitted to slide forward under the action of its spring, so as to strike the alarm. During the retrograde motion of the slide C the hinged dog on the striker yields and permits the incline *p′* to pass without effect on the striking-bar. The bar J is provided, as plainly represented in Figs. 1, 3, and 5, with three vertical notches, *g*, *g′*, and *g″*, into which the slides K engage successively, as hereinafter explained, to prevent the striking of the alarm. As shown in Fig. 3, the notches are so disposed that but one slide can be in a notch at a given time, for reasons hereinafter explained. The three slides K, K′, and K″ lie at right angles to the axis of the register-wheels, one between each wheel and the next. Each slide has on the under side a series of cog-teeth, *i*, intended to engage with a corresponding pinion, M, of which there is one

formed upon the side of each register-wheel, so that the rotation of the register-wheels causes the corresponding slide, when in engagement therewith, to be gradually advanced endwise to the right. Each slide protrudes through both ends of the case or body, one end being graduated and provided with a series of numerals, as shown at *h*, Fig. 2, their disposition being such that the slide is carried the length of its graduated portion by one rotation of the corresponding register-wheel. At their opposite ends the slides are each mounted in a slot in the body or casing, in order that they may be raised independently sufficiently to disengage them from the respective operating-pinions, as represented in Fig. 8. The slides are urged constantly downward by means of spring-arms L, (shown in dotted lines in Fig. 1 and in full lines in Fig. 2) these springs serving to throw the teeth of the slides into engagement with the operating-pinions whenever the slides are released by the transverse striking-bar J. To facilitate the accurate longitudinal adjustment of the slides and to prevent them from being moved endwise by accident, their upper edges may be provided with a series of notches to receive the ends of the springs L, as shown. Each of the slides is constructed with a vertically widened end, terminating in a shoulder, *m*, located at such point that, as the slide completes its movement to the right under the action of the operating-pinion, the shoulder *m* is carried beyond the bar J, thereby releasing said bar J from that particular slide.

In proceeding to adjust the apparatus to strike an alarm when a given number has been reached, I proceed as follows: Supposing it be desired to sound the alarm when the number "435" has been reached, I first lift the protruding ends of each bar to disengage the same from the pinion and slide the bar to the left until the desired number thereon is in line with the outer side of the case. After thus adjusting the bars endwise, I lift all of the bars clear of the striking-bar J and move the latter backward in the direction indicated by the arrow in Fig. 1, releasing the slides and permitting them to descend while the bar is thus held. The result is that the slide K″, representing hundreds, drops into the notch *g″* in the striking-bar, engaging with the pinion and the wheel K″, and also holding the same away from its striking position, as represented in Fig. 3, the two remaining slides, K and K′, resting on top of the striking-bar, as shown in the same figure, and being held out of engagement with their pinions. The apparatus is now ready for operation. The reciprocation of the primary actuating-slide causes motion to be imparted to the series of wheels, as before described. During the earlier portion of the operation the wheels B and B′ have no action upon the corresponding slides; but the hundreds-wheel B″ gradually advances its slide K″ to the right. When the predetermined number of hundreds have been registered, the shoulder *m* of the slide K″ passes beyond and out of the bar J, whereupon the bar is carried slightly to the right, as indicated by the arrow in Fig. 3, until the wide end of the second slide, K′, drops into the notch *g′*, so that it in turn prevents the striking-bar from advancing. By this action the slide K′ is in turn engaged with its pinion on the wheel B′, the rotation of which wheel causes the slide K′ to be advanced until the desired number of tens is registered, when the shoulder of said slide K′ is in turn carried beyond the striking-bar, whereupon the bar is forced to the right until the slide K enters the notch *g′*, whereby the bar is still held away from a striking position. The falling of the slide K into the notch *g* causes said slide to engage in its turn with its operating-pinion on the unit-wheel B, whereby the slide is gradually moved to the right. At the instant that the wheel B registers the determined number of units its shoulder in turn disengages the slide J, which is thus left free to slide to the right under the action of its spring and sound the alarm. This last movement of the striking-bar brings its pivoted dog in such position that at each advance of the operating-bar C its inclined face or wedge will cause the striking-bar to be moved backward and released, so as to again effect the striking under the action of its spring. In this manner the sounding of the alarm will continue to take place at each reciprocation of the slide C after the predetermined number has been reached. The register-wheels B are each provided with a laterally-projecting peripheral flange, which is notched in the edge to form projecting teeth *b*, and which is also provided on the periphery with numerals stamped therein, as shown.

The wheels are preferably constructed of sheet metal by a method which will constitute the subject-matter of a separate application, and which it is not necessary to describe herein, as they may be constructed by any suitable method, provided they are given the form herein shown.

Instead of operating the first or unit wheel by the pawl on the reciprocating bar, I may employ a pawl carried by a rock-shaft arranged as represented in Figs. 9 and 10.

A rock-shaft, A′, carrying the series of wheels, is inserted transversely through the case or body and screwed rigidly thereto at one end. Around this sleeve I insert from the inside of the case a rocking hub or collar, B″, carrying the pawl D, which actuates the unit-wheel. The hub B has a neck extending through the case to the outer side, and provided with studs *a′*, which interlock with corresponding studs or shoulders on a vibrating lever, C′, mounted around the hub, and secured thereon by means of a nut or collar, D′, secured upon the outer end of the same. In this manner the lever C′, which will be connected with the prime mover in any suitable manner, is firmly locked to the hub B″, so as to transmit its vibrations or oscillations thereto, causing the

pawl or dog D′ to be moved forward and backward.

Having thus described my invention, what I claim is—

1. In a register, the combination of the register-wheel provided with a pawl or dog at its side, a second register-wheel provided with teeth upon its side, and an intermediate switch-plate constructed to act upon opposite sides of the dog, substantially as described, whereby it is adapted to throw the dog of the first wheel positively into and out of engagement with the second wheel, substantially as set forth.

2. In combination with a register-wheel having the arm or dog applied to its side, the second register-wheel provided with teeth upon its side, and the intermediate stationary switch-plate having the laterally-extended portion *c d*, adapted, as described, to permit the passage of the dog or pawl beneath them.

3. In combination with two register-wheels and a connecting-dog, substantially as described, an intermediate elastic plate, G, having one edge fastened in position, and the opposite edge provided with a projection, *f*, to engage the second wheel, as described, whereby the accidental movement of said wheel is prevented.

4. The improved switch-plate and detent for a counting-register, consisting of the plate G, having the switch-arms *c* and *d* and detent *f* formed thereon, substantially as shown.

5. In combination with a register-wheel toothed on its side face, and a second wheel provided with a pawl or dog to engage therewith, an intermediate plate provided with a switch constructed to operate on the two sides of the dog and throw the same positively into and out of engagement, and having its face adapted, as described, to hold said dog positively out of engagement during the proper intervals.

6. In combination with a perforated register-wheel, a dog or pawl, E, consisting of a single piece of sheet metal in substantially the form shown, with lips or projections at one end as a means of attachment to the register-wheel.

7. The improved dog or detent for the wheels of a counting-register, consisting of a single plate of elastic sheet metal, constructed substantially as shown, with the central opening, the projection *f* raised from one side, and the two lips or shoulders on the opposite side, as described, for the attachment of the plate to the support.

8. In a register, the combination of the register wheels or dials provided with pinions, the slides connected with and operated by the respective pinions, and the striking-bar controlled in its action by the slides, substantially as shown.

9. In a combined register and alarm, the combination, with actuating-pinions, substantially as described, of the shouldered slides, and the transvese striker-bar, notched, in the manner described, to admit but one of the slides at a time.

10. In a combined register and alarm, a series of register-wheels provided with pinions, and an alarm mechanism controlled in its action by a movable bar, in combination with two series of toothed slides to control said bar, each slide being adjustable longitudinally and independently in respect to its pinion, whereby the mechanism is adapted to be adjusted to sound an alarm when a predetermined number is indicated.

11. In a combined register and alarm mechanism, the reciprocating bar provided with the inclined face, in combination with the striking-bar and its pivoted dog, and the controlling-slides, adapted, as described, to hold the striking-bar out of the path of the inclined face until the proper number has been indicated.

JOHN G. LETTELIER.

Witnesses:
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