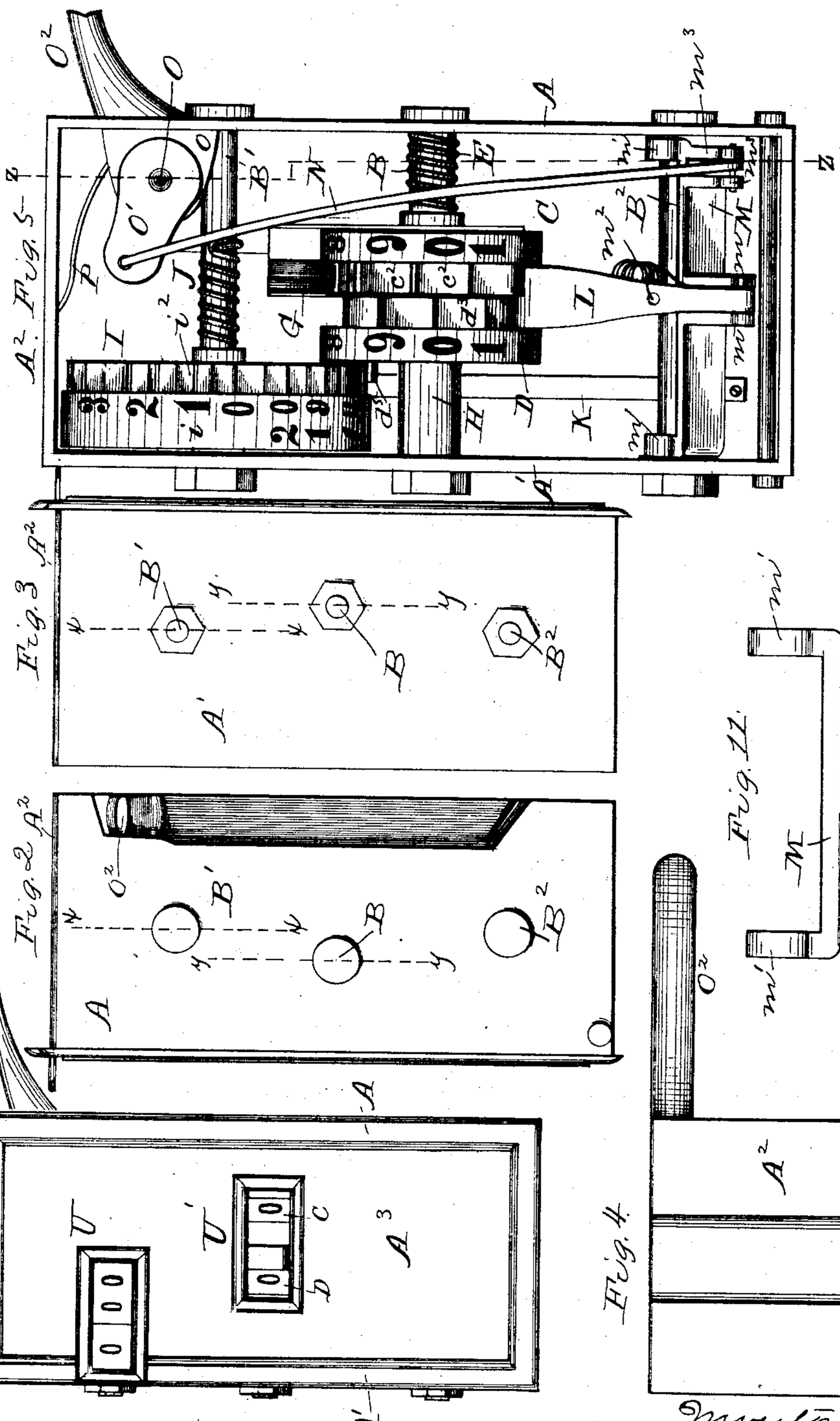
(No Model.)

2 Sheets—Sheet 1.

F. STANTON.

GRAIN REGISTER.

No. 344,013. Patented June 22, 1886.



Witnesses
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(No Model.) 2 Sheets—Sheet 2.

F. STANTON.

GRAIN REGISTER.

No. 344,013. Patented June 22, 1886.

Fig. 6

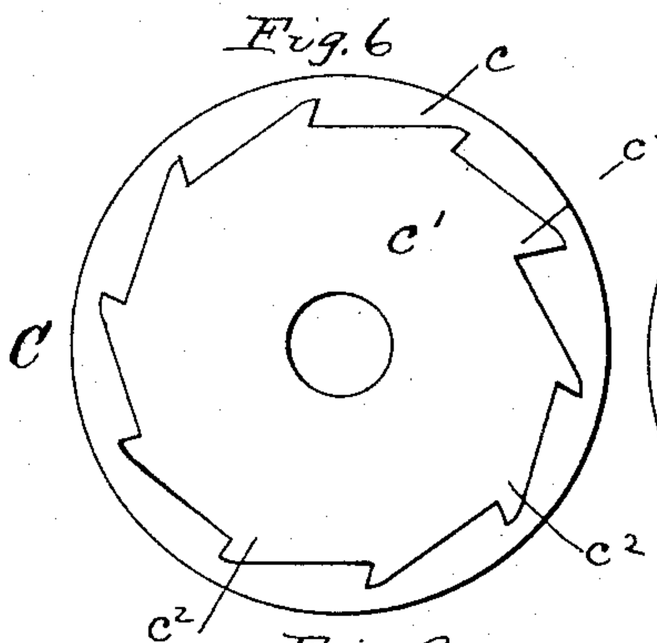


Fig. 7

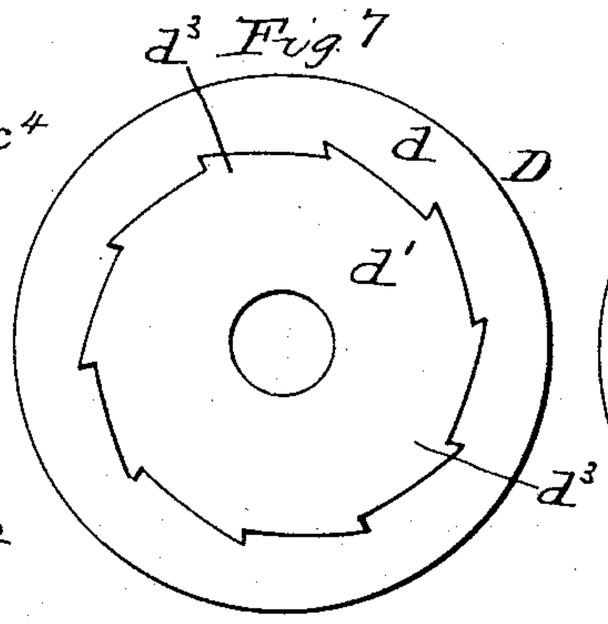


Fig. 8.

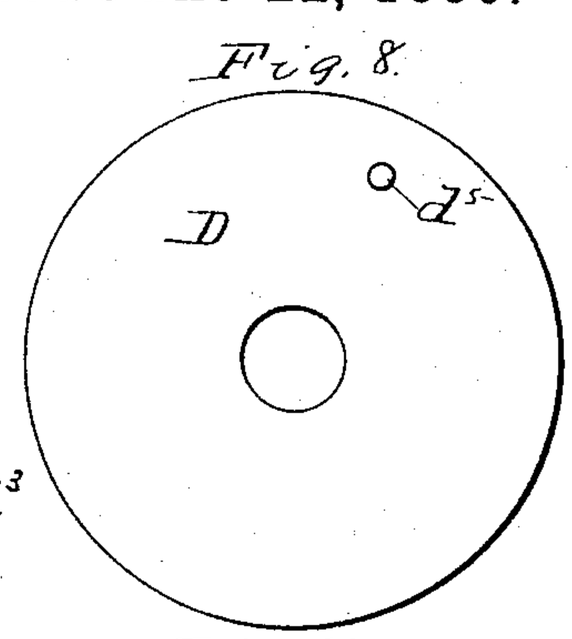


Fig. 9.

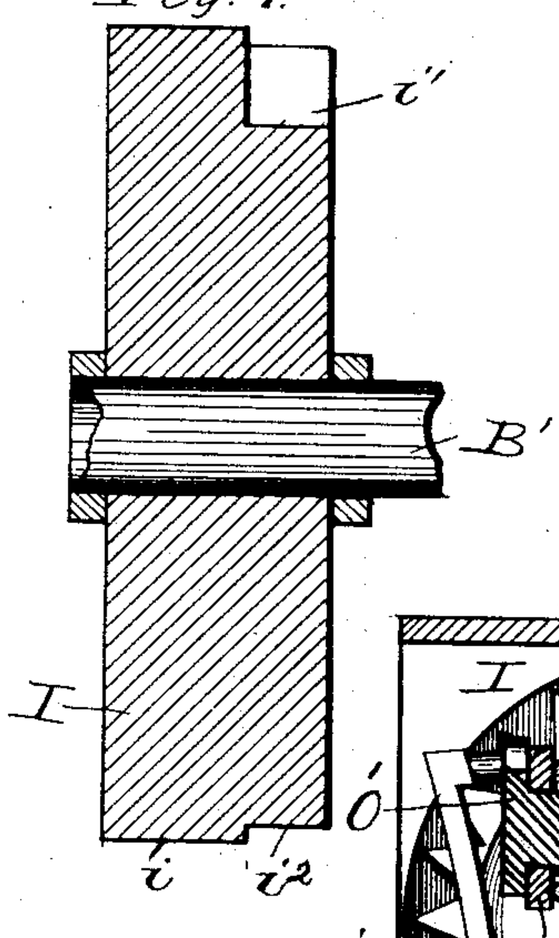


Fig. 10.

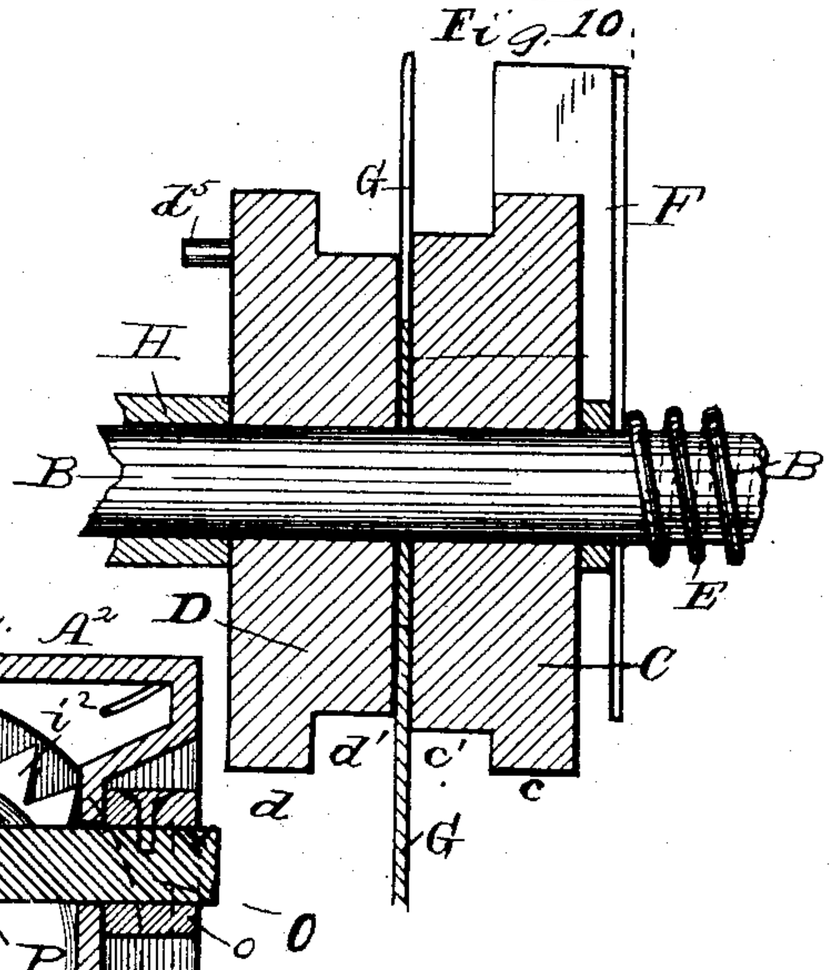
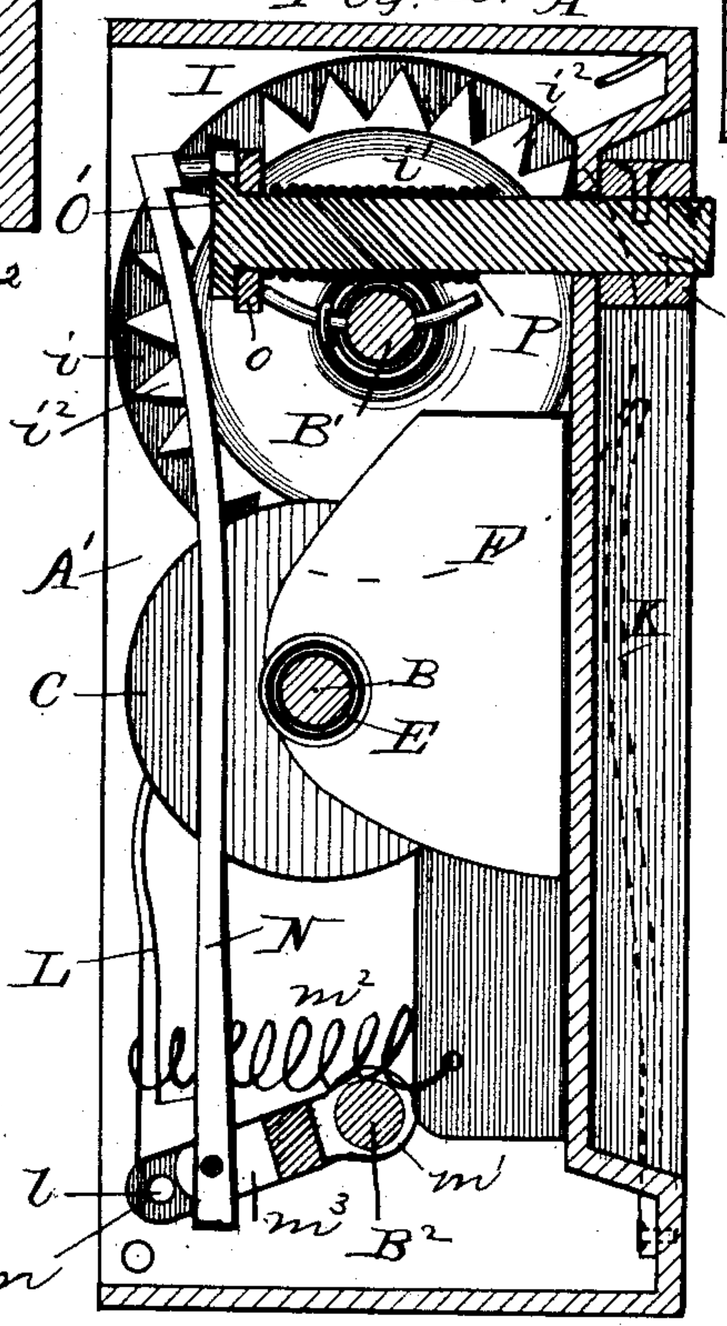


Fig. 12.



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UNITED STATES PATENT OFFICE.

FREAD STANTON, OF STILLWATER, MINNESOTA, ASSIGNOR TO E. S. BROWN, RECEIVER OF THE NORTH WESTERN MANUFACTURING AND CAR COMPANY, OF SAME PLACE.

GRAIN-REGISTER.

SPECIFICATION forming part of Letters Patent No. 344,013, dated June 22, 1886.

Application filed July 16, 1885. Serial No. 171,765. (No model.)

To all whom it may concern:

Be it known that I, FREAD STANTON, a citizen of the United States, residing at Stillwater, in the county of Washington and State of Minnesota, have invented certain new and useful Improvements in Grain-Registers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a mechanism for automatically registering the number of measures or weights of materials, such as grain and the like, although it may be used in automatically counting in any of the many places where devices of this sort are found necessary.

The object of the present invention is to provide a compact, simply-constructed, and durable set of parts, whereby the reciprocations of an initial motor part shall be registered up to any desired number.

Figure 1 is a front view of the register when the parts are in operative position. Fig. 2 is a view on the side of the reciprocating lever. Fig. 3 is a view from the opposite side. Fig. 4 is a top plan view. Fig. 5 is a front elevation of the operative parts, the door being opened. Fig. 6 is a face view of the units-wheel. Fig. 7 is a face view of the tens-wheel. Fig. 8 is a view of the opposite face of the last said wheel. Fig. 9 is a section on the line *x x*, Figs. 2 and 3. Fig. 10 is a section on the line *y y*, Figs. 2 and 3. Fig. 11 shows the pawl-frame removed. Fig. 12 is a section on line *z z*, Fig. 5.

The operative parts of the mechanism are mounted and concealed within a casing, which, by reason of the compactness and close arrangement of the few parts, can be very small, it having side walls, A A′, top A^2, door A^3, and a rear wall and bottom. (Not lettered.)

B B′ are shafts mounted transversely across the casing, and carrying the count-wheels situated in the interior.

On the shaft B are mounted, side by side, the units-wheel C, and the tens-wheel D. The units-wheel C is constructed with a part, *c*, of larger diameter, and a part, *c′*, somewhat less, the periphery of the former being smooth and provided with numerals from 0 to 9. The periphery of the part *c′* is provided with ten teeth, c^2. The operative faces of these teeth are all of the same length, except that indicated at c^4, which is somewhat deeper, for a purpose to be explained. The tens-wheel D is also formed with two portions, *d d′*, the former having a smooth periphery, provided with numbers extending from 0 to 9, and the latter being provided with teeth d^2. The radii of these teeth and of the part *d′* generally are shorter than those of the corresponding parts, *c′* c^2, on the wheel C. The wheels C and D, as said above, are placed side by side on the same shaft B, in immediate proximity to each other, and are arranged to be operated by a common pawl, to be described. While the wheels *c′ a′* are racheted throughout their entire circumference, and hence both adapted to be completely rotated by a reciprocating pawl, still, by reason of the one, *c*, being of greater diameter than the other, *a′*, and the two lying side by side, a single pawl having a plain straight engaging-edge may be relied upon to effect the entire rotation of both wheels, thus simplifying the machine over such constructions as have an operating-pawl for each wheel, or require a pawl of peculiar construction in order to engage with both the wheels, as has heretofore been done.

To prevent the retraction of the units-wheel C, a coiled spring, E, is mounted upon an around the shaft B, the tension thereof having the effect desired. Between the spring E and the face of the wheel C there is interposed a friction-plate, F, which extends over a considerable portion of the face of the wheel, and in order to have it held properly in place it is provided with an aperture, through which the shaft passes, the spring thus being able to bear against the plate on all sides of the shaft. The same spring E is utilized to prevent the retraction of the tens-wheel D, both the wheels being loose on the shaft and allowed movement longitudinally thereon. Between them another plate, G, is inserted, which not only acts by friction to prevent the retraction of the tens-wheel D, but also keeps the wheels separate to such an extent as to prevent the forward motion of the units-wheel from being imparted to the tens-wheel. A sleeve, H, is interposed between the wheel D and the wall A′, whereby the wheel is held properly in position, although the same end may be attained in any of numerous other ways.

On the upper shaft, B′, is mounted the hun-

dreds-wheel I. It also is formed with two parts, *i* and *i'*, the former of which has a smooth periphery to receive a series of numbers extending from 0 up to any desired point, in the construction shown the series ending with 20, and the latter part, *i'*, of the wheel has teeth i^2 on its periphery, as shown. With these teeth a pin or spur, d^5, carried by wheel D, is adapted to engage once at each revolution.

J is a coiled spring placed around the shaft B' and tending to prevent the wheel I from retracting. This spring presses longitudinally of the shaft; but under some circumstances a spring of this character cannot be alone depended upon to prevent the backward movement of the wheel, and therefore I combine with the teeth a peripheral spring, K, the face of which bears against the teeth and by its pressure forces the wheel laterally against the shaft, so that the latter is cramped or bound in two directions.

L represents the pawl which is used to propel both the wheel C and the wheel D. It is at its upper end broad enough to reach from the part *c* of one to the part *d* of the other, although it lies between them loosely. This pawl is pivoted at *l* to the two forward-projecting arms *m m* of the pawl-frame, having the main bar M and eyes *m' m'* pivoted upon the shaft B^2. This shaft is parallel to the axis about which the count-wheels revolve, as will be readily seen.

The pawl is held with a yielding pressure against the faces of the above-described ratchet-teeth by means of a spring, m^2.

N is a link or pitman, by which the pawl-frame is operated, this being pivoted to said frame between the arms m^3 m^3. The link is operated by means of a rock-shaft, O, which is mounted transversely to the parts above described, it being supported in bearings at *o*. It has a crank, O', at one end, to which the link or pitman N is pivoted, and at the other end it is provided with a lever, O^2, by means of which the movements are initially imparted to the counting mechanism.

P is a coiled spring, mounted upon and around the shaft O, to which it is fastened at one of its ends, the other being arranged to bear against some fixed part of the casing or frame—as, for instance, against the top plate, as shown. This spring tends to elevate the lever O^2—that is, to return it to its position of rest—and therefore it tends to lower the pawl L, and bring it to such position that it shall be ready to engage with the next of the series of ratchet-teeth on the units-wheel.

As already said, the wheels C, D, and I are respectively provided with digits, and the door A^3 is provided with windows at U U', through which one can readily read the numbers which indicate the total number that at any stage has been reached.

The manner of using my improved register will be readily understood from the above description and from an examination of the drawings. Let it be supposed that all of the wheels are so arranged that the zeros thereon are opposite the windows U U' at the time the instrument is started. The first downward movement of the lever O^2 will result in turning the wheel C far enough to bring the number 1 up to the window, the figures at this time which are in sight being 0 0 1, and by subsequent similar steps the indications given are 0 0 2, 0 0 3, &c., until the wheel C is turned nine steps. At its tenth step the pawl drops into the deeper notch at c^4, and then it is so arranged that it can also engage with the first tooth on wheel D, and as it (wheel C) makes its tenth step the pawl also carries up wheel D, and the indication is 010. When wheel D is about to complete its tenth advance, the pin d^5 engages with the hundreds-wheel I, causing it to move far enough to indicate that the number 100 has been reached.

I am aware of the fact that three wheels have been used in various ways to indicate numbers in counting-machines; also that such wheels have been provided with peripheral figures, and with peripheral figures and ratchet-teeth; also that use has been made of coiled springs for the purpose of preventing retraction of count-wheels, and I do not claim these matters broadly, as my invention; but I have found that a register constructed as is the one I have shown, is, in many places where these devices are used, superior to those with which I am acquainted. It is much simpler than many of those which have been heretofore tried, the parts being so constructed and related to each other and to the casing that I can bring them all into a small compass, and can dispense with many of the devices which have rendered these registers, as heretofore named, very complicated, and liable to get out of repair. By mounting the units-wheel and the tens-wheel on a common shaft, and placing the pawl below them, I can arrange the power rock-shaft transverse to their axis, and in close proximity to them on the upper side. I dispense entirely with the intermediate wheels, which are employed in certain constructions of registers, for the purpose of imparting motion from one count-wheel to another, depending upon a single pawl to move the first two wheels, and a simple pin to move the third, it engaging directly therewith, and not with an intermediate wheel.

In practice comparatively small wheels for the units and tens can be used and yet have figures of a suitable size, as but ten spaces are required upon each; but it is not so with the hundreds wheel, for if it is desired to indicate a number of hundreds above ten with one wheel, either a larger wheel is necessary or the spaces upon the periphery must be decreased if this hundreds-wheel (when indicating more than ten hundreds) is of the same diameter as those for the tens and units; but, as above said, the spaces on the periphery and the size of the numbers thereon cannot be decreased advantageously. Therefore a larger

wheel is desirable for the hundreds; and a larger wheel cannot be used on the same shaft with the smaller wheels for the units and tens without encountering several disadvantages, among which are, first, the fact that the peripheries of the wheels will be at different distances from the reading-apertures at U U′; and, second, the fact that a more or less complicated mechanism is necessary to operate the hundreds-wheel. If a large hundreds-wheel is mounted upon the shaft of the units and tens wheels, a pawl mechanism different from any heretofore used must be employed in order to insure that a linear distance is traveled by the periphery of the hundreds-wheel equal to that traveled by the peripheries of the units and tens wheels. If a pawl, such as that at L, arranged in the same way and at the same distance from the shaft is used for moving the hundreds-wheel, (supposing it to be mounted on the shaft of the tens wheel,) it (the pawl) would cause a portion of the periphery of the hundreds-wheel to pass the reading-aperture U′ much larger than is that portion of the tens-wheel which is at the same time passing the aperture U. By mounting the hundreds-wheel on a shaft other than that of the tens and units wheels I make it possible to overcome these objections, and avoid the necessity of having more than three wheels, even though it is desired to count more than ten hundreds.

I am aware of the fact that in various registers use has been made of two count-wheels and a pin carried by one to engage directly with and advance the other.

By arranging the shaft O transverse to the other parts of the mechanism, as shown, several advantages are attained. In the first place, the handle or lever O^2 may be directly attached thereto in proper working position without the intervention of any intermediate mechanism, and, further, when arranged in the manner described in a register having a count-wheel of larger size mounted upon a separate shaft, it may be arranged opposite the larger wheel, and thus made to occupy a portion of the space within the casing which would otherwise be left vacant, this arrangement enabling the parts to be mounted within the smallest possible space without their interfering one with another.

I claim—

1. In a registering mechanism, the combination, with the inclosing-casing, of a units-wheel and a tens-wheel, both mounted on a common shaft, a hundreds-wheel of a larger size than said units and tens wheel mounted on a shaft parallel with the shaft on which are mounted said units and tens wheels, said hundreds-wheels being arranged to have the front part of its periphery in substantially the same plane as the front parts of the units and tens wheels, a pin on the tens-wheel which intermittingly moves the hundreds-wheel, a pawl which operates the units and tens wheels, the rock-shaft O, mounted opposite the larger hundreds-wheel and transverse to the shaft thereof, the lever O^2, which moves said rock-shaft, and mechanism, substantially such as described, connecting the rock-shaft with the said pawl, substantially as described.

2. The combination, with the casing, of the units-wheel and tens-wheel, both mounted on a common shaft, the hundreds-wheel on a parallel shaft, the pin on the tens-wheel engaging directly with the hundreds-wheel, the pawl below the units-wheel and tens-wheel, the rocking stirrup or U-shaped frame which carries the pawl and is mounted on an axis parallel to that of the count-wheels, and the power rock-shaft above and transverse to said axis, the link which connects the rock-shaft with the pawl-frame, and the lever projecting outward from said shaft, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FREAD STANTON.

Witnesses:
W. S. GOODHUE,
C. R. MINN.