

(No Model.)

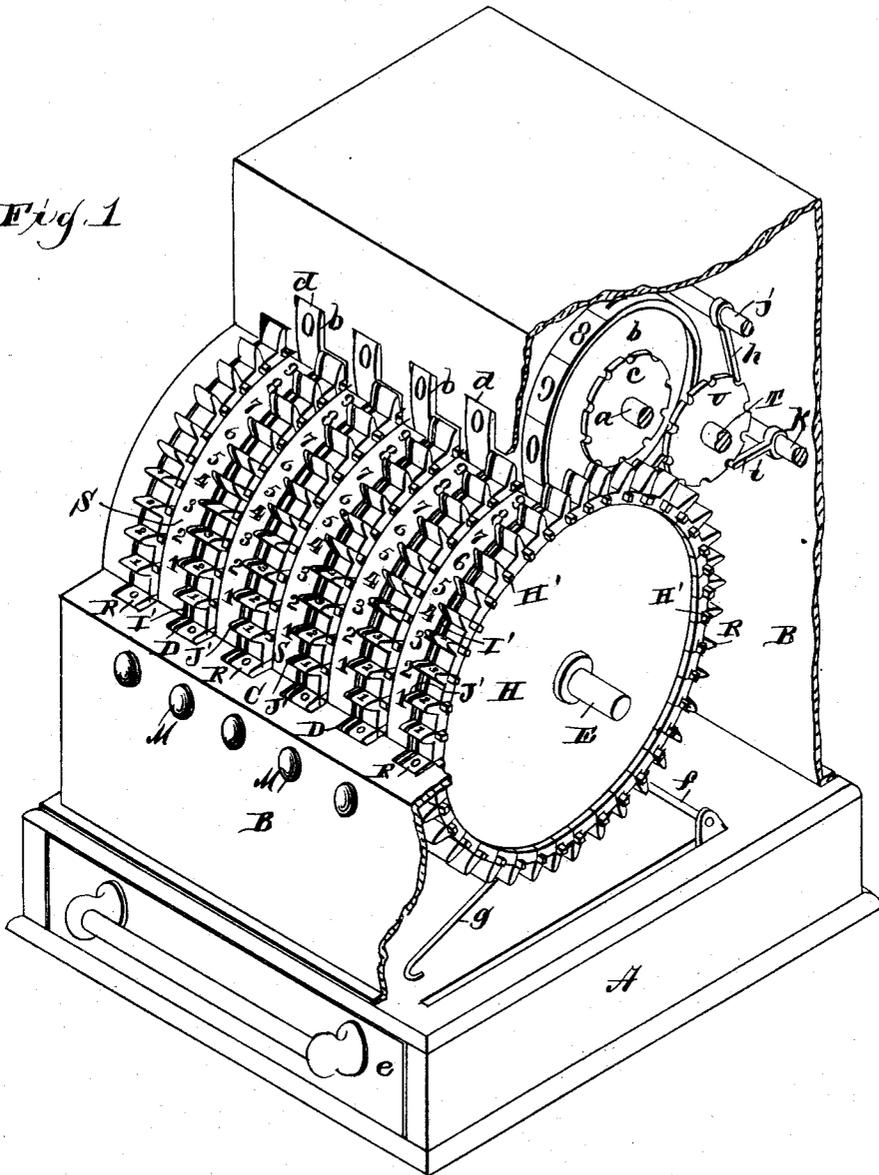
4 Sheets—Sheet 1.

J. H. SCHNARRENBERGER.
CASH REGISTER AND INDICATOR.

No. 422,545.

Patented Mar. 4, 1890.

Fig. 1



Witnesses
 Warren Hill
 T. O. Thompson

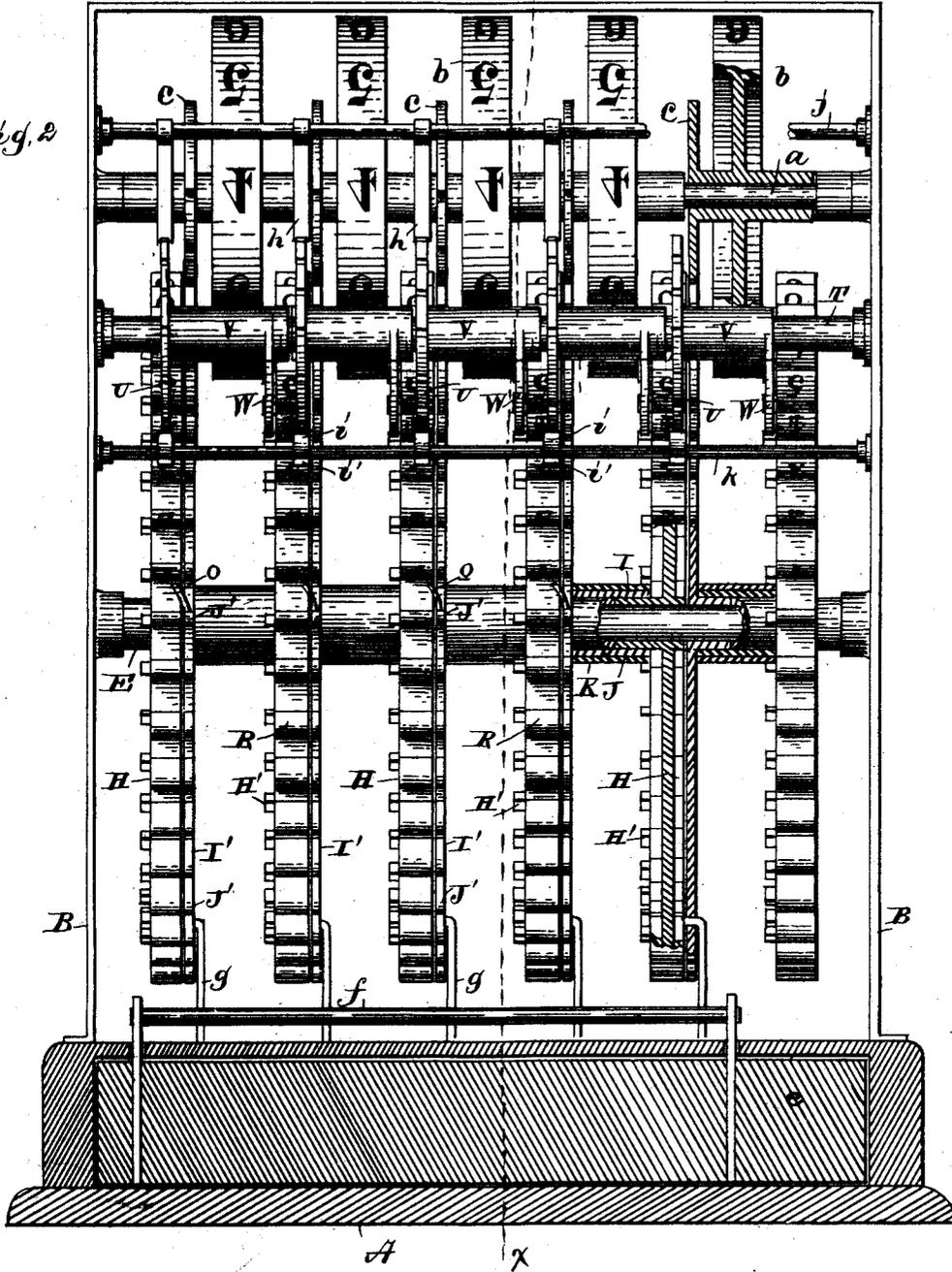
Inventor
 Jacob H. Schnarrenberger,
 By A. A. Paulmier
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J. H. SCHNARRENBERGER.
CASH REGISTER AND INDICATOR.

No. 422,545.

Patented Mar. 4, 1890.

Fig. 2



Witnesses
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(No Model.)

4 Sheets—Sheet 4.

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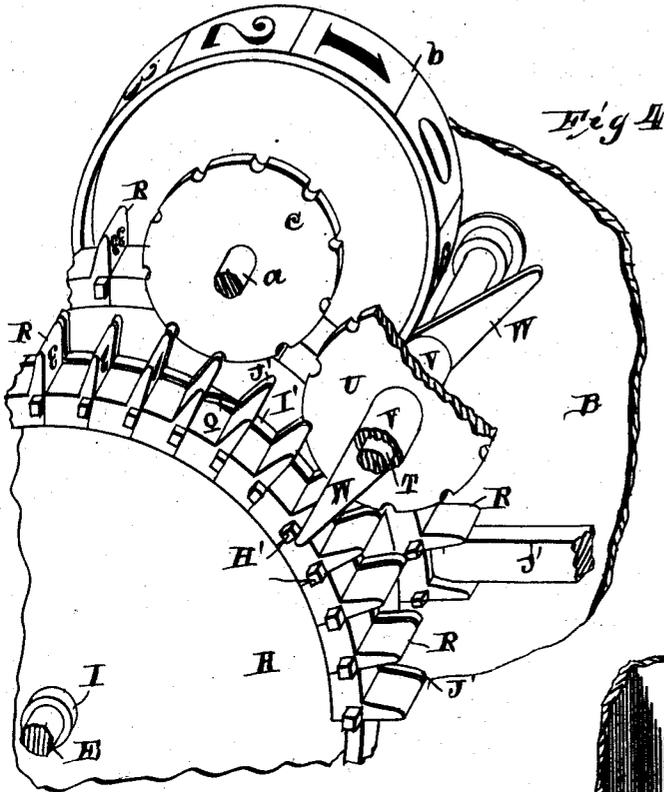


Fig. 4

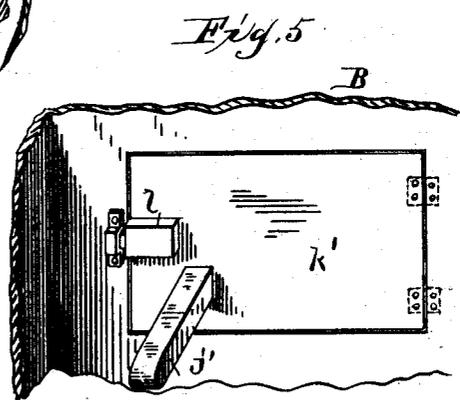


Fig. 5

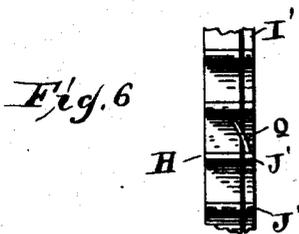


Fig. 6

Witnesses
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T. P. Thompson

Inventor,
Jacob H. Schnarrenberger,
By S. A. Faulstich
his Attorney.

UNITED STATES PATENT OFFICE.

JACOB H. SCHNARRENBERGER, OF SPRINGFIELD, OHIO, ASSIGNOR OF ONE-HALF TO THOMAS REYNOLDS, OF SAME PLACE.

CASH REGISTER AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 422,545, dated March 4, 1890.

Application filed June 5, 1889. Serial No. 313,216. (No model.)

To all whom it may concern:

Be it known that I, JACOB H. SCHNARRENBERGER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Combined Adding and Cash-Registering Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in combined cash registering and indicating machines; and the object of the invention is to exhibit to the view of the purchaser the sum of the purchase and at the same time unerringly add together all of such amounts, the amount of each purchase being added to the sum of the purchases already made at each operation of the machine, so that at the end of the day, or at other appointed periods of time, the proprietor upon removing the cash from the receptacle or drawer will merely have to glance at the sum-total registered on the machine to ascertain the amount received during such period. As the amount received should agree with the amount registered on the machine, the machine acts as a check upon the dishonesty of employes.

The invention consists of certain organizations, combinations, and constructions hereinafter more fully described, and pointed out in the claims, the general characteristic being the combination of the registering mechanism with the indicating mechanism, the former involving the use of adding-disks and the latter that of rotatable indicating-wheels so arranged with intermediate and operating mechanism that when the machine is actuated the amount of the purchase will be presented to view and such amount be shown by the adding-disks.

In the accompanying drawings, forming a part of this specification, and on which like reference-letters indicate corresponding parts, Figure 1 represents a perspective view of my improved machine entire with parts of the casing broken away to show the interior arrangement; Fig. 2, a partial rear elevation and partial vertical sectional view of the machine; Fig. 3, a vertical sectional view on the line *x x* of Fig. 2; Fig. 4, a perspective sec-

tional view of portions of the adding-disks, motion-transmitting mechanism, locking device, and registering mechanism; Fig. 5, a detail perspective view of the locking mechanism and a portion of the casing, looking from the inside; and Fig. 6, a detail edge view of a portion of an adding and registering disk, showing the engaging-pawl.

The letter A designates the base of the frame, which is made of wood or metal, vulcanized rubber, or other suitable material, and upon this base or formed with it is a casing B, which incloses the mechanism, and also forms bearings for the shafts or arbors. The style and finish of these parts may be varied with the taste of the maker. The casing B is formed with a ledge or offset C, having notches D, through which pass the projections on the adding-disks. This ledge constitutes a gage at which to adjust the figures of the disks involved in any particular example, and at which point they are read, as will be more fully explained farther on.

In the casing is rigidly mounted an arbor E. On this arbor are rotatably and independently mounted the adding-disks H, having hubs I of sufficient length to space the disks from each other. In order to prevent the disks from passing beyond the desired point as the result of momentum when given a motion by the hand, I prefer to apply a frictional device in the nature of a brake, which can be adjusted to exert more or less frictional pressure against some convenient part of the disks, as may be required, or to take up the wear. The form of device preferred for this purpose is clearly shown in Figs. 2 and 3, in which J indicates a strip of felt or other soft material, and K a plate curved at one end and fitted over the hubs I with the felt intervening, and formed with a screw-threaded portion at its other end to receive a thumb-nut M, by which the felt can be drawn more or less forcibly against the hubs I. From Fig. 2 it will be seen that the several strips of felt and the plates K are arranged so that each of them will engage or operate upon the adjacent portions of the hubs of each two disks. While this arrangement is not essential, I yet prefer it for convenience.

Each disk H is provided with a suitable number of teeth or projections R—forty of such projections in the present instance—and these projections, as more clearly seen in Fig. 3, are fashioned somewhat after the shape of gear-teeth, so that they will more properly mesh with the similarly-shaped notches in the disks which enter into the construction of the motion-transmitting mechanism. I also prefer to place the figures or groups of figures which the disks bear upon these projections, and hence construct them large enough to accommodate figures of ample size for easy reading, and I also prefer to utilize these projections as means through which to take hold of the disks with the hand to rotate them. I do not wish to be understood, however, as intending to say that my invention is limited to so constructing the adding-disks and their projections, for it is obvious that the disks may be modified in respect to the place and manner of applying the figures and in the provision of means for readily taking hold of them to rotate them.

In Fig. 1 it will be observed that the upper sides of the projections bear the figures. These figures are arranged in groups from 0 to 9, inclusive, and in the present instance each disk has four of such groups or forty projections, save the last disk to the left, which, while it has forty projections, or the same number of projections as each of the other disks, yet has the projections numbered from 0 to 39, inclusive and progressively, as distinguished from being arranged in groups.

The letter S designates a scale of figures arranged in groups agreeing with the groups of figures on the disks, as aforesaid, with the exception of the omission of 0 from said scale of figures. These scale figures are preferably placed upon the face of segmental strips of metal or other material secured to or forming a part of the casing and extending from the ledge C upward and between the disks, the figures commencing with 1, which is above the ledge, and ending with 9, which is near the upper terminus of the strips.

In operating the machine the operator looks to the scales immediately to the left of the units, tens, or hundreds columns, or the disks representing such columns, respectively, for the figure which he desires to add, and opposite to which figure will be found the projection of the adding-disk which should be moved within the slot D, as will presently more fully appear. Each of the disks H is provided at one side with a series of gear-teeth H', which operate in conjunction with the motion-transmitting mechanism, as will also presently appear. Each adding or registering disk H, save the last one to the left, has associated with it an indicating-disk I', rotatably mounted on the arbor E and provided with projections J', agreeing in number and position with the projections R, and adapted to be engaged by the fingers in taking hold of the projections R, to be thus

rotated with the disks H. These disks I', through their projections J', mesh with the registering mechanism, as will presently appear, so as to present to view the amount of a particular purchase at the same time that such an amount is indicated by the adding-disks or added to the amounts of previous purchases.

I will now refer to the motion-transmitting mechanism, and will then describe the registering mechanism. Of the former mechanism, the letter T designates a shaft, by preference fixedly mounted in the casing. On this shaft are freely mounted a number of gear-wheels U, one for each adding-disk, save the last disk to the left. Each of these gear-wheels is formed with or has attached to it a sleeve V, and to the sleeve is connected an arm W adjacent to the next disk to the left, and which arm engages at intervals with the adding-disks, save the units-disk, or the one to the extreme right. This arrangement is illustrated in Figs. 2 and 4, from which it will also be observed that there is no arm W for the units-disk and no gear-wheel U for the last disk to the left.

The operation of the motion-transmitting mechanism is as follows: In the first place the purpose of the motion-transmitting mechanism is to enable each disk to operate the disk immediately to the left thereof at certain intervals—for instance, to enable the units-disk to so operate the tens-disk and the tens-disk to so operate the hundreds-disk. It will be understood that each disk meshes with the adjacent gear-wheel U, so that the rotation, say, of the units-disk will rotate its gear-wheel, and as each gear-wheel U (in the present instance) has one-fourth as many teeth as the large disk a gear-wheel will rotate once at each quarter rotation of such disk. The parts are so arranged that as 9 passes beneath the ledge and 0 approaches and reaches the plane of such ledge the arm W will rotate the tens disk one space, or move it until 0 carried by it will descend from the ledge and 1 take its place. The same operation will occur between the tens-disk and the hundreds-disk, and so on through the series, the gear-wheels and the arms W acting to transmit the motion from one to the other of the disks. This is the means by which a sum too large to be indicated by one disk is carried over to the other disk to the left, so that such sum will be indicated by the disks collectively.

In my application of February 6, 1889, Serial No. 298,350, for adding and subtracting machines, I showed and described the arm W as having a movement independent of the sleeves V. This construction may be employed in the present machine, though it is not necessary, as the gear-teeth H' on the disks H are so spaced and are of such size as to admit of connecting the arms W rigidly with the sleeves V without interfering with the proper operation of the machine.

For the purpose of facilitating and under-

standing so much of the motion-transmitting mechanism as is shown in Fig. 4 I would observe that the gear-wheel U shown therein is connected with the sleeve V and arm W to the rear thereof, while the sleeve and arm shown this side of said gear-wheel are carried by a gear-wheel which is this side of said latter sleeve and arm, but is removed in this figure. It will also be observed from Figs. 2 and 4 that, while the arms W engage with the teeth H', the gear-wheels U engage with the projections R.

I will now proceed to describe the indicating mechanism other than the disks I'. This mechanism consists of a shaft *a*, rigidly mounted in the casing B and having loosely mounted thereon as many indicating-wheels *b* as there are adding-disks, save the last to the left. The hub of each of the wheels *b* carries a gear-wheel *c*, and these gear-wheels *c* mesh with the disks I', respectively, as seen in Figs. 2 and 4 particularly. The peripheries of the indicating-wheels *b* bear the figures 0 to 9, inclusive, which are seen through the openings *d* in the casing B, as seen in Fig. 1. When the adding-disks and the indicating-disks are rotated in the manner already referred to, these indicating-wheels are also rotated, and the figure on the periphery of the particular wheel operated will be presented to view through the adjacent opening *d*, and will represent the amount of the purchase, either alone or in connection with the figure on another wheel or wheels, as will hereinafter appear.

As the money-drawer is opened to deposit the amount it automatically removes the amount of the purchase from view through the openings *d* and places 0 instead thereof opposite the said openings. I will now describe the mechanism for accomplishing this. The money-drawer *e* is provided with a transverse rod *f*, and the indicating-disks I' each have pawls *g*, which gravitate or hang across the path of this bar *f*, so that it engages with the pawls and by the act of opening the drawer rotates such of the indicating-disks as may have been moved in registering the last amount, and whose pawl *g* was thereby carried back, say, to the position shown in dotted lines in Fig. 3. As a disk I' is thus turned back as the drawer moves out to receive the amount indicated, the said disk engages with its gear *c* and turns back the connected indicating-wheel *b* to present 0 to view through the opening *d*, in the casing. When the drawer is pushed in the detent is disengaged with the bar *f* and 0 left to view.

In order to prevent any manipulation of the apparatus for dishonest purposes by canceling the sum of the addition shown by the adding-disks at the reading-point, and which sum should agree with the amount in the drawer, I provide detents *h* and *i*, hung upon the rods *j* and *k*, respectively. The detents *h* prevent the gear-wheels U from turning back, and therefore prevent the adding-disks from being turned back when the machine is

in an upright position. The detents *i* normally stand out of the path of the gear-wheels U, being supported by the shanks *i'*, which engage the casing; but should the machine be inverted or manipulated to disengage the detents *h* the detents *i* will automatically engage the gear-wheels U and still prevent their being turned back.

It is obvious that various forms of locking-detents and different arrangements of them may be made, and I do not wish to confine myself to those shown.

In order to prevent the fraudulent cancellation of the added sum indicated by the adding-disks at the reading-point by manipulating the disks to change such sum entirely and present 0 to view on each adding-disk, I have provided for locking the last adding-disk to the left. When this is done, such fraudulent manipulation cannot be practiced, first, because the adding-disk cannot be turned backward by reason of the locking-detents already described, and, secondly, because all of the disks cannot be manipulated to present 0 to the reading-point by turning them in a forward direction unless the last disk to the left is free to turn. It is true that all of the disks save the last two to the left may be manipulated to present 0 instead of some higher figure; yet the very act of doing so raises the sum registered, because by such manipulation of the disks of lower denominations you have to pass from 9 to 0, which has the effect of making the next disk of higher denomination show a higher figure than before, and hence increase the sum registered rather than decrease it. As this would be against the fraudulent operator, making him account for more money than the drawer would contain, he will not attempt such manipulation.

The mechanism for locking the last disk to the left consists of a bar *j'*, fashioned to enter between the projections of said last disk and secured to a door *k'* or removable part of the casing. When this door is swung open, the bar is withdrawn from engagement with said disk and all of the adding-disks left free, so as to be reset to zero, ready to commence the work of adding the amounts of sales thereafter made.

The door *k'* is provided with any suitable lock *l*, preferably with a combination or safe lock, so that the door cannot be opened, except by the proprietor or his confidential employé.

In Fig. 3 the knob and scale of the lock are shown at *m*.

A further provision to prevent fraud is made by the employment of a suitable device to prevent the indicating-disks from being manipulated independently of the adding-disks. It will be understood that if this independent manipulation were permitted a dishonest employé could operate the indicating-disks on the occasion of a purchase to cause the indicating-wheels to present to view the amount

of the purchase without adding such amount to the previous amounts.

After the customer had gone away the operator could open the drawer and take out the amount of such unadded purchase without detection. Various forms of device may be employed for this purpose, and I now describe a simple form, which consists of a spring-pawl *o*. (See Figs. 2 and 6.) One end of the pawl is fixed into a projection *J'* of an indicating-disk and the other end abuts against a projection *R* of an adding-disk *H*. Thus it will be seen that an indicating-disk cannot be turned forward independently of its adjacent adding-disk, and at the same time the indicating-disk can be turned back independently of the adding-disk, this turning back to be accomplished by pulling out the drawer in the manner already described. From Fig. 2 it will be seen that the location of this spring-pawl is within the casing, and preferably at the rear of the machine, so as to be inaccessible to the operator to prevent any fraudulent manipulation of it, for it will be understood that if the operator could turn an indicating-disk without turning an adding-disk he could present the amount of the purchase to the view of the purchaser without adding such amount. With this provision, however, such cannot be done.

The operation of the machine will be understood, in view of the foregoing, in connection with the following remarks: Should a sale be made, say, to the amount of two dollars and twenty-five cents, the clerk will turn to the machine and press the projections *R* and *J'* of the hundreds adding and indicating disks which stand opposite to "2" on the indicator-scale down to the slot *D*. He will then likewise press down to the slot *D* the projections of the tens-disks which are opposite to "2" of the indicator-scale. Then he will finally likewise press down to the slot *D* the projections of the units-disks which stand opposite "5" of the indicator-scale. This will exhibit \$2.25 as the amount of the purchase both at the reading-point of the adding-disks and the reading-point of the indicating-wheels. On pulling out the drawer to deposit the money the intermediate devices, already described, will turn the indicating-disks back, and likewise turn back the indicating-wheels until 0 is presented in the slots *d*. The machine will then show at the reading-point of the adding-disks the amount of the purchase and the indicating-wheels will exhibit 0 and be ready to exhibit the amount of the next purchase upon a similar manipulation of the machine. Thus I provide for mechanically and unerringly adding together the amount of the various purchases and for exhibiting to view the amount of each purchase, and then canceling such amount by the act of placing the money within the drawer, which occurs after the purchaser has had the amount of his purchase exhibited to him.

I hereby disclaim in this application the

adding and brake mechanism in their combined relation, also the adding-disks and the motion-transmitting mechanism consisting of the gears and the arms, except, as hereinbefore specified, by the introduction of the gear-teeth on the disks with which said arms engage, as these subjects-matter form a part of my application for improvements in adding and subtracting machines, filed February 1, 1889, Serial No. 298,350.

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

1. In a combined registering and cash-indicating machine, the combination, with the frame, reading points or places established on the frame, and an arbor mounted therein, of a series of rotatable adding or cash-registering disks independently mounted on said arbor, a series of indicating-disks independently mounted on said arbor, a scale arranged near the adding-disks, motion-transmitting mechanism connecting one adding-disk with the next of ascending order intermittently, and indicating-wheels operatively connected with said indicating-disks, and mechanism to return the indicating mechanism to zero, the whole being so arranged that when the registering and indicating disks are simultaneously moved the former act to perform addition and the latter to operate the indicating-wheels to present to view the amount to be added.

2. In a combined registering and cash-indicating machine, the combination, with the frame, reading points or places established on the frame, and an arbor mounted therein, of a series of rotatable adding-disks independently mounted on said arbor, a like series of indicating-disks also mounted independently on said arbor, the two kinds of disks being associated in pairs and rotatable together in one direction, but free in the other, a scale arranged near the adding-disks, motion-transmitting mechanism connecting each of said adding-disks intermittently in the ascending order, indicating-wheels geared to the indicating-disks in corresponding series, and mechanism to return the indicating mechanism to zero, whereby upon simultaneously operating the two kinds of disks the one adds and the other presents to view on the indicating-wheels the amount added.

3. In a combined registering and cash-indicating machine, the combination, with the frame, reading points or places established thereon, and an arbor mounted therein, of a series of rotatable adding-disks independently mounted on said arbor, a series of indicating-disks also mounted on said arbor, of which there is one associated with each adding-disk save the last one to the left, mechanism to lock this latter disk, mechanism to clutch the associated adding and indicating disks in one direction, but not in the other, indicator-figures arranged near the said disks, two other shafts mounted in the frame, a series of in-

dependent gears mounted on one of said shafts engaging with the adding-disks, arms carried by said gears to operate said latter disks at intervals, save the units-disk, indicating-wheels and gear-wheels connected in pairs, mounted on the other shaft, and engaged by the indicating-disks, and mechanism to return the indicating mechanism to zero.

10 4. In a combined registering and cash-indicating machine, the combination, with the frame, reading points or places established thereon, and an arbor mounted therein, of a series of rotatable adding-disks independently
15 mounted on said arbor and locking mechanism for the last of said disks to the left, mechanism for clutching together each pair of adding and indicating disks in one direction, but not in the other, motion-transmitting mechanism connecting each adding-disk with the
20 next of higher order intermittently, locking mechanism to prevent turning back the said motion mechanism, indicating mechanism operatively connected with said indicating-disks,
25 a drawer or money-receptacle, and devices between it and the indicating-disks for turning back the latter upon the drawer is drawn out.

5. In a combined registering and cash-indicating machine, the combination, with the
30 frame, reading points or places established thereon, and an arbor mounted therein, of a series of rotatable adding-disks independently mounted on said arbor, an inaccessible locking device for the last of said disks to the
35 left, indicating - disks, also independently mounted on said arbor, of which there is one for each adding-disk save said last one to the left, an engaging-pawl between each pair of
40 adding and indicating disks which clutch in one direction and escape in the other, two other shafts mounted in said frame, gear-wheels, each carrying an arm, mounted on one of said shafts, the said wheels and arms
45 engaging with the adding-disks, substantially as described, locking-detents for said gear-wheels, indicating-wheels and gear-wheels in pairs mounted on said other shaft, said latter gear-wheels meshing with the indicating-disks,
50 a money-drawer, a rod carried thereby, and hooks carried by the indicating-disks and adapted to be engaged by the said bar as the drawer is drawn out.

6. In a combined registering and cash-indicating machine, the combination, with the
55 frame and an arbor mounted therein, adding-disks mounted on said arbor, and an indicating-disk also mounted on said arbor and in proximity to the adding-disk, of clutch mechanism connecting said disks together in one
60 direction, but not in the other, and located inaccessibly within said casing, a shaft also mounted in said frame, and indicating-wheels

mounted thereon and operating in conjunction with the said indicating-disks.

7. In a combined registering and cash-indicating machine, the combination, with the frame and an arbor mounted therein, of a series of rotatable adding or cash-registering disks independently mounted upon said arbor, motion-transmitting mechanism connecting one adding-disk with the next of ascending order intermittently, and an inaccessible locking device projecting from the interior of the casing and arranged to engage with the last disk to the left of said series and prevent the rotation of said disk.

8. In a combined registering and cash-indicating machine, the combination, with the frame and an arbor mounted therein, of a series of indicating - disks independently mounted upon said arbor, a drawer or removable money-receptacle mounted in said frame, and intermediate devices between said disks and said drawer which are engaged when the latter is drawn out to turn back said disks, for the purpose described.

9. In a combined registering and cash-indicating machine, the combination, with the frame and an arbor mounted therein, of a series of indicating - disks independently mounted upon said arbor, a drawer or movable money-receptacle mounted in said frame and having a cross-bar, and a depending detent carried by each of said disks and adapted to be engaged by said bar as the drawer is drawn out.

10. In a combined registering and cash-indicating machine, the combination, with the frame and an arbor mounted therein, of a series of rotatable adding-disks independently mounted upon said arbor, motion-transmitting mechanism connecting each disk intermittently with the next of higher order, and a double set of pawls engaging said motion-transmitting mechanism in one direction, but not in the other, to prevent the latter from being turned back.

11. In a combined registering and indicating machine, the combination, with the frame and an arbor mounted therein, of a series of rotatable adding - disks independently mounted on said arbor, each disk having teeth-like projections and each, save the units-disk, having gear-teeth at one side, a shaft also mounted in the frame, a series of gear-wheels mounted upon said shaft and meshing with said disks save the last to the left, and an arm carried by each gear-wheel and meshing, respectively, with the disks having gear-teeth.

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

JACOB H. SCHNARRENBERGER.

Witnesses:

THOS. REYNOLDS,
D. Z. GARDNER.