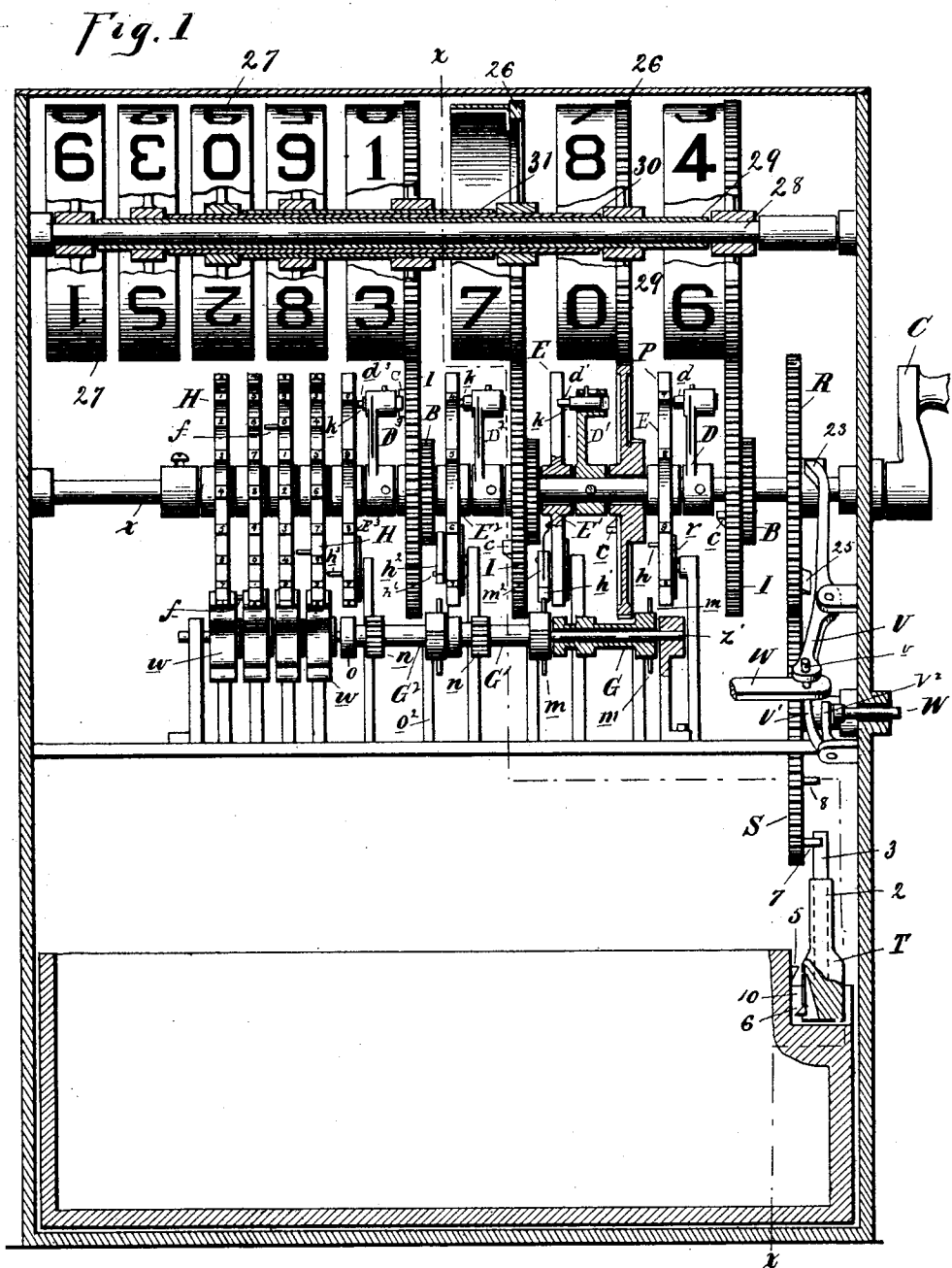


C. PAINE.

CASH REGISTERING AND ADDING MACHINE.

No. 483,009.

Patented Sept. 20, 1892.



Witnesses:

P. M. Hulbert
 W. B. Fogarty

Inventor:

Channing Paine
 By *Wm. S. Sprague* Attys

(No Model.)

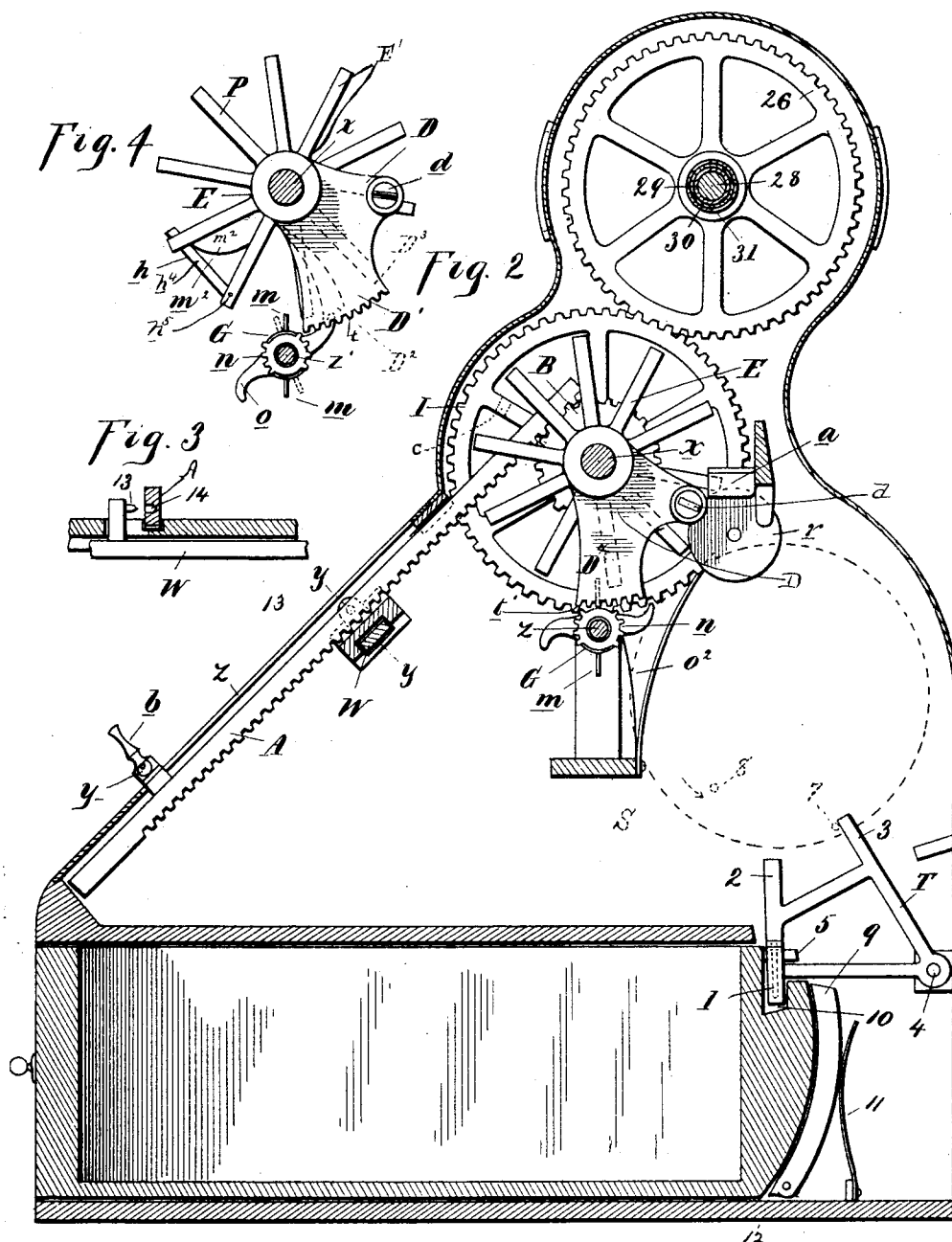
4 Sheets—Sheet 2.

C. PAINE.

CASH REGISTERING AND ADDING MACHINE.

No. 483,009.

Patented Sept. 20, 1892.



Witnesses:

V. M. Hulbert
M. B. O'Leary

Inventor:

Channing Paine
By *Thos. Spagnoli*
Attys

(No Model.)

4 Sheets—Sheet 3.

C. PAINE.

CASH REGISTERING AND ADDING MACHINE.

No. 483,009.

Patented Sept. 20, 1892.

Fig. 7

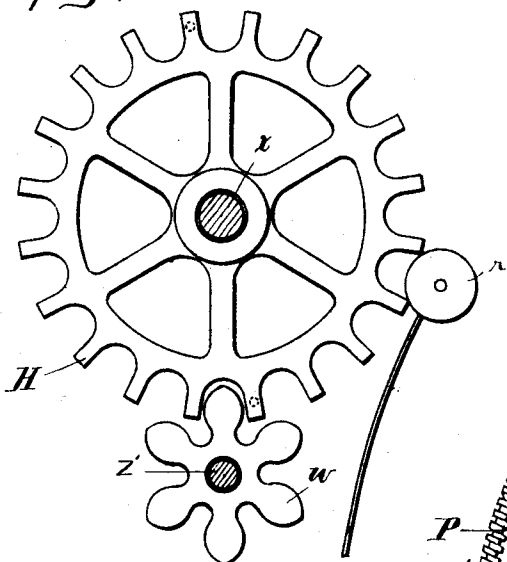


Fig. 6

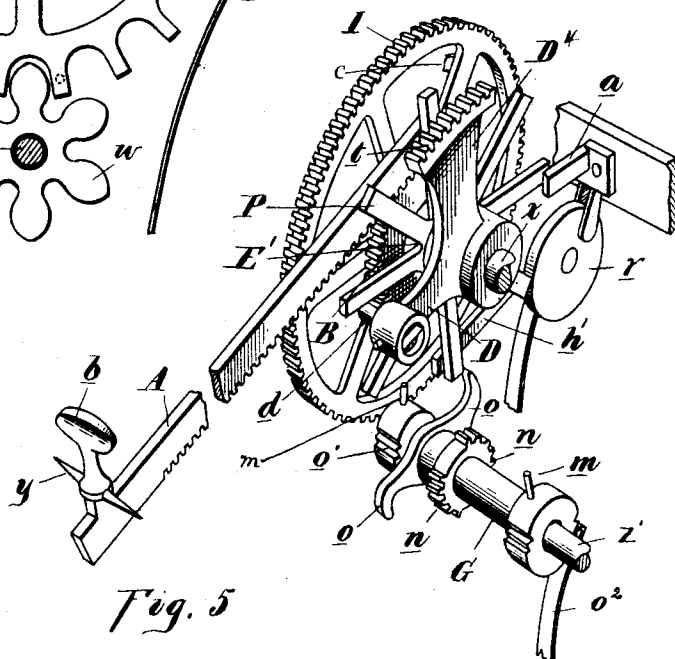
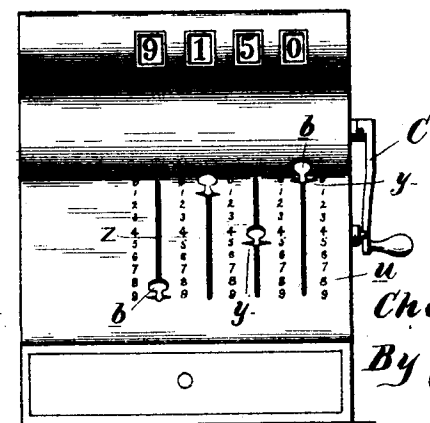


Fig. 5



Witnesses:

P. M. Hullbert
W. D. Dougherty

Inventor:

Channing Paine
By *Wm. S. Magneto*
Attys

(No Model.)

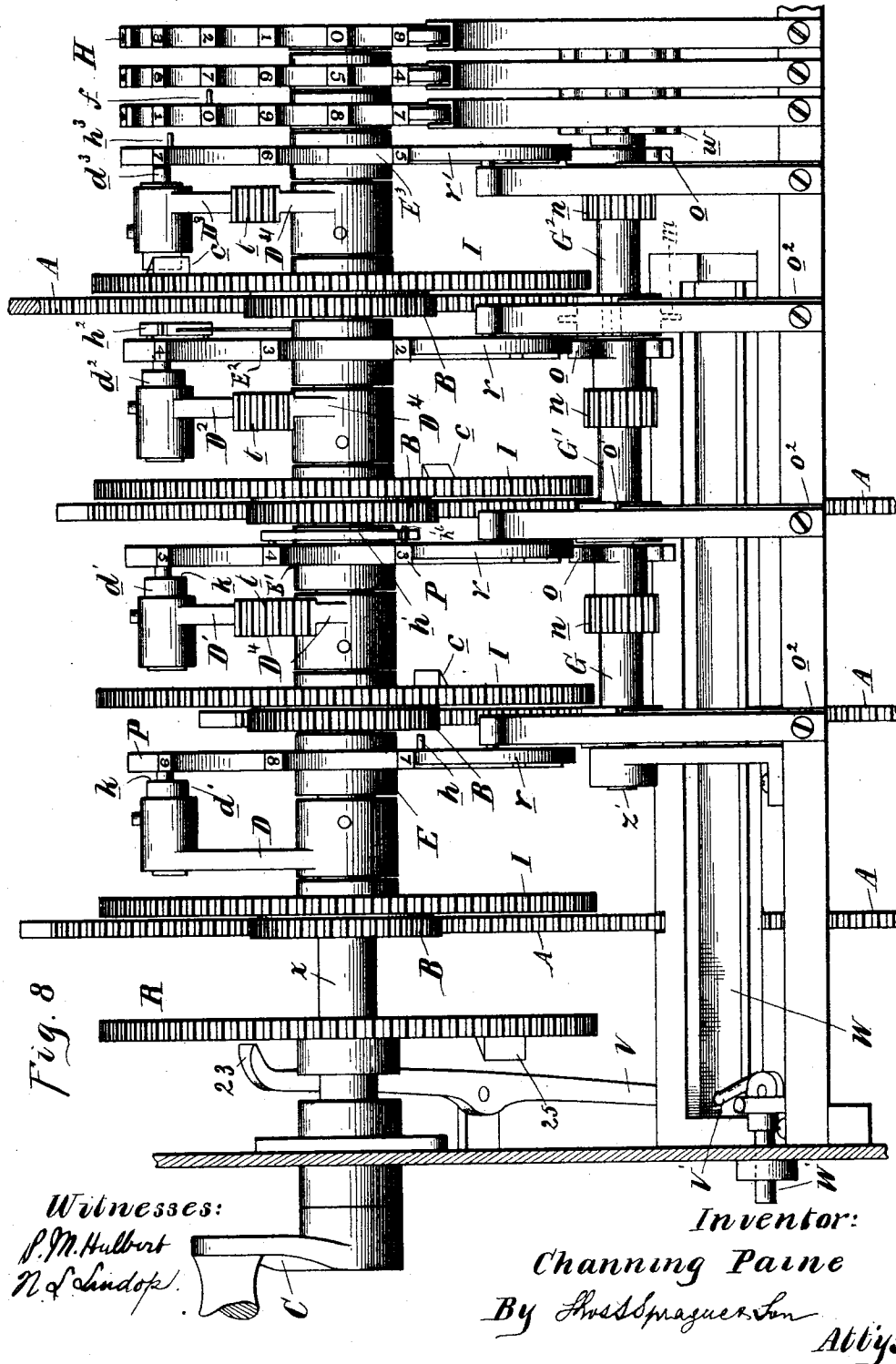
4 Sheets—Sheet 4.

C. PAINE.

CASH REGISTERING AND ADDING MACHINE.

No. 483,009.

Patented Sept. 20, 1892.



UNITED STATES PATENT OFFICE.

CHANNING PAINE, OF NEW YORK, N. Y.

CASH REGISTERING AND ADDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 483,009, dated September 20, 1892.

Application filed February 20, 1890. Serial No. 341,105. (No model.)

To all whom it may concern:

Be it known that I, CHANNING PAINE, a citizen of the United States, and a resident of the city, county, and State of New York, have invented new and useful Improvements in Cash Registering and Adding Machines, of which the following is a specification.

This invention relates to new and useful improvements in cash register and indicating machines; and it consists in the peculiar construction of the registering mechanism and in the means employed for totalizing the amount registered.

The invention further consists in the peculiar construction of the indicating mechanism, and, further, in the peculiar construction, arrangement, and combination of the various parts, all as more fully hereinafter described.

In the accompanying drawings, Figure 1 is a front elevation of the registering and indicating mechanism, partly in section and with the actuating rack-bars removed, also showing the case and cash-drawer. Fig. 2 is a vertical section through my improved machine and its case on line *x x* of Fig. 1. Fig. 3 is a cross-section on line *y y* in Fig. 1. Fig. 4 is a detached elevation of the registering mechanism, as shown in Fig. 1, with the parts in different position. Fig. 5 is a front elevation of my machine. Fig. 6 is a detached perspective view of one group of the registering mechanism and its actuating rack-bar. Fig. 7 is an elevation of one of the totalizing-wheels. Fig. 8 is an enlarged rear view of a portion of the upper and lower shafts with their several attachments.

The machine shown in the accompanying drawings is constructed to add numbers having four figures or less. The mechanism for adding units, which is substantially duplicated in the tens, hundreds, and thousands series, consists of the rack A, the setting-wheel I, with its geared hub B, revolving loosely on the actuating-shaft *x*, the lug *c*, the pawl or bolt *d*, carried by a suitable arm D, which is rigidly attached to the actuating-shaft *x*, the adding-wheel E, which rotates freely on the actuating-shaft *x*, and the disengaging-post *a*, fixed in the frame of the machine. The actuating-shaft *x* is journaled at each end of the frame of the machine, and each operation of adding requires its complete revolution by

the crank C or other suitable means. The rack A slides in suitable bearings in constant engagement with the hub B.

Extending upward through the slot *z* is the arm or handle *b*, by which the operator slides the rack backward or forward. This slot is of such length that the extreme movement of the arm *b* causes the rack to rotate the setting-wheel I nine-tenths of a complete revolution. A construction by which an endless chain is substituted for a rack would be equally feasible.

The arm *b* is provided with the pointer *y*, which travels over the index-plate *u*. This index-plate is divided into ten equal spaces for the numerals from "0" to "9," inclusive. The lug *c*, which is rigidly attached to the setting-wheel I, is brought by the movement of the pointer into any one of ten equidistant positions around the shaft *x*, corresponding to the numerals to which the pointer is moved. The office of the lug *c* is to drive the pawl or bolt *d* into engagement with the spokes P of the adding-wheel E, as hereinafter shown.

The setting-wheel is fitted with spur-gear to engage the indicating-wheels, as hereinafter described.

The arm D is rigidly attached to and rotates with the shaft *x* and carries the pawl or bolt *d*. This bolt is designed to be moved by the lug *c* into engagement with the adding-wheel E, it projecting between the spokes of the wheel, and as the arm D revolves with the revolution of the shaft *x* the adding-wheel is also carried around the required number of tenths of a revolution. The bolt is then disengaged from the adding-wheel by the fixed post *a*, which throws it back to a position ready to be again driven by the lug *c* in the next operation. The fixed part *a* is secured on a stationary part of the frame and extends out toward the adding-wheel in the path of the projecting bolt. Its upper face is beveled or inclined downwardly toward the wheel E, as plainly shown in Fig. 6.

To cause the bolt to perform its functions, the contact-surfaces of the lug *c* and the bolt *d* are beveled, as shown. The end of the bolt toward the adding-wheel E is provided with a pin or teat and a shoulder *k*. This shoulder strikes the beveled face of the post *a*, which is shown in Figs. 2 and 6, thus throwing the

teat back out of engagement with the adding-wheel. This disengagement takes place during the last one-tenth of a revolution of the arm D.

5 The adding-wheel E, Figs. 2 and 4, rotates freely on the shaft x and has ten teeth or spokes, on the ends of which the ten numerals are consecutively placed, as shown in Figs. 1 and 2. It is by the engagement of the bolt d 10 with the appropriate one of these teeth or spokes that the adding-wheel is carried the required number of tenths of a revolution in the process of adding. The space between the spokes is such that in an operation where 15 nothing is to be added on the wheel the bolt can be driven in between the spokes thereof by the lug and immediately removed by the post without moving the adding-wheel. To hold the adding-wheel in its proper position 20 while at rest, the roller-spring r , Fig. 6, which works into the spaces between the spokes, is employed.

The office of the arm D of the units series is simply to carry the pawl or bolt d . The arms D' , D^2 , and D^3 , respectively, of the tens, hundreds, 25 and thousands series have the further office of actuating parts of the mechanism for "carrying ten," as hereinafter described. For this purpose they are provided with the segmental gears t , which are placed on extensions D^4 , the arms in advance of or in such relation to the bolts d' that they will engage the parts to be actuated thereby after the disengagement of the bolts from the adding-wheel, 35 so that the part with which the segment engages may be actuated thereby without moving the adding-wheel. The teeth t are so placed on the tens-arm D' as to begin their work a little in advance of those on the hundreds-arm D^2 , and those on the hundreds-arm begin their work a little in advance of those on the thousands-arm D^3 . This arrangement is for the purpose of securing successive action by the different series of the carrying 40 mechanism, as will be more fully explained hereinafter.

The finger h is rigidly attached to the units-adding wheel E and is so placed that when the adding-wheel has made nine-tenths of a 50 revolution from its normal or starting position, at zero, the point of the finger is just ready to engage with one of the spurs m on the carrying-sleeve G, located on the shaft Z' . Its office is to turn the sleeve G part of a revolution upon the continued movement of the 55 wheel E, and it performs this work at the beginning of the last tenth of a revolution of the units-adding wheel.

The pawl h' on the tens-adding wheel E' is 60 pivoted to that wheel. This pawl consists of a bar h^4 , pivoted to one of the spokes at h^5 , its free end being held in place and allowed an inwardly-swinging movement by a spring m^2 , secured to one of the spokes, as shown in 65 Fig. 4. Its office is to turn the carrying-sleeve through part of a revolution at the beginning of the last tenth of a revolution of

the tens-adding wheel, and it is so placed on the wheel that its free end is just ready to engage one of the spurs m of the carrying- 70 sleeve G' when the adding-wheel has completed nine-tenths of a revolution.

Under certain conditions it becomes necessary when the adding-wheel is at rest for a spur m to pass from above or behind the pawl 75 h' to a position just in front of and ready to be operated by it at the next movement of the adding-wheel. To permit this action, the free end of the pawl rests on a spring m^2 , Figs. 1 and 4, and when the spur m comes 80 against the pawl the latter is forced back against the spring sufficiently to permit the spur to pass. As soon as the spur gets by the pawl the spring throws the pawl to its former position against the stop-pin h^6 , ready 85 at the next movement of the adding-wheel to act on the spur m , which has thus come in front of it.

The pawl h^3 on the hundreds-adding wheel E² is identical in construction with the pawl 90 h' on the tens-adding wheel, and its action on its spur m is similar to that of the tens-adding wheel.

The finger or pin h^3 on the thousands-adding wheel E³ is designed to engage the teeth 95 on the auxiliary carrying-wheel, as hereinafter more fully shown.

The mechanism for carrying ten consists, in addition to the teeth on the pawl-arms, the fingers h and h^3 , and the pawls h' , of the arbor z' , parallel with the shaft x , and the devices carried thereon. The sleeve G comes into action in carrying ten from the units to the tens adding wheel. It revolves on the arbor z' and consists of the spurs m , the mutilated pinion n , and the arms o o . The sleeve 100 also has the notches o' , in which the spring o'' works to hold the sleeve in its proper positions. When the units-adding wheel E begins the last one-tenth of a complete revolution, the finger h engages one of the spurs m , and the sleeve G is thereby turned sufficiently to bring the teeth of one of the segments n into a position ready to be engaged by the teeth t of the arm D^4 . The position of the 115 arms o o on the sleeve is such that when one of the segments n is ready to be engaged by the teeth t one of the arms o , while free from the adding-wheel E' of higher denomination, is ready to engage a spoke. By the action of 120 the teeth t on one of the segments n an arm o is brought into engagement with the spokes of wheel E', and during the time that the teeth t are in engagement with the segment n the arm o drives the tens-adding wheel 125 one-tenth of a revolution and clears itself from the wheel. Until the sleeve has been moved by the finger h of the units-adding wheel the position of the sleeve will not permit the engagement of its segments n 130 by the teeth t . The sleeve G makes but a half-revolution at one operation, and the spurs m m come into action alternately, as do the segmental gears n n of the mutilated pinion

and the arms *o o*. The action of the teeth *t* on either of the segmental gears *n n* brings a spur *m* into a position to be engaged by the finger *h* of the units-adding wheel.

5 The sleeve *G'*, which is operated in carrying ten from the tens to the hundreds adding wheel, and the sleeve *G²*, which carries from the hundreds to the thousands adding wheel, are identical in construction with the
10 units-sleeve *G* and all revolve on the arbor *z'*.

To register the totals of additions where such totals consist of more than four figures, the auxiliary adding-wheels *H* and the auxiliary carrying-wheels *w* are employed. The auxiliary adding-wheels rotate on the shaft *x* and are held in their proper position when at rest by the roller-springs *r' r'*. These wheels *H*, as shown in the drawings, have twenty equidistant teeth or spokes, on the ends of which
15 the ten numerals in successive order from "0" to "9," inclusive, are placed and repeated. A construction having ten spokes or any multiple of ten is feasible, as is also one in which the setting-wheels and adding-wheels are arranged for multiples of ten. The auxiliary
20 carrying-wheels *w*, as more plainly shown in Fig. 4, rotate freely on the arbor *z'*. They extend laterally beyond the wheels *H* and are in constant engagement with the teeth or spokes of the auxiliary adding-wheels *H*. During the last one-tenth of a revolution of the thousands-adding wheel *E³*, the pin *h³* engages the inner carrying-wheel *w*, and the engagement is of such duration that it forces the
30 wheel *w* to drive the adding-wheel *H* one-twentieth of a revolution, sufficiently to bring into view the number next above the one previously shown.

All the auxiliary carrying-wheels are similar in construction. The auxiliary adding-wheels *H* have the pins *f*, the purpose of which is to engage the auxiliary carrying-wheel *w*. These pins are so placed that one of them comes into such engagement at the
40 end of each half of a complete revolution of the wheel carrying it—that is, when the movements of that wheel have brought it around from "0" to "9." During the movement of this wheel from "9" to "0" a pin *f* is in engagement with one of the carrying-wheels *w*
50 and causes the latter to drive the adjoining adding-wheel one-twentieth of a revolution, thus causing it to register a number one higher than that previously shown. The last of the series of adding-wheels in the machine
55 illustrated has no pins. The auxiliary adding and carrying mechanism may be increased, as desired, to register higher totals.

To prevent movement of the racks during the revolution of the shaft *X*, a locking device is employed. The locking-rod *W* slides in suitable bearings under and at right angles to the racks *A* and is provided with the bolts 13, Figs. 2 and 3, to engage holes 14 in the racks,
60 the number of bolts on rod *W* corresponding to the number of racks *A*. To the end of the locking-rod nearest the crank is attached

one end of the lever *V*. This lever is pivoted to the frame of the machine, and its free end, which has the beveled shoulder 23, extends
70 to a point opposite the gear-wheel *R*, keyed on shaft *X*, as shown in Fig. 1. Attached to the end of the lever nearest the locking-rod is the lever *V'*, pivoted in the frame of the machine, the connection between the levers being
75 made by a pivot-bolt *v*, which also unites the same with the rod *W*. Opposite the free end of this lever *V'* and sliding at right angles thereto in proper bearings through the frame of the machine is the push-pin *W'*, the inner
80 end of which comes in contact with the lever *V'*, and the outer end projects through the frame of the machine at such a point that it forms a stop for the crank *C*. When the shaft
85 *X* is to be revolved, this stop is pushed inward out of the path of the crank to prevent a complete revolution of the same. The inward movement of the stop *W'* actuates the lever
90 *V'*, which in turn causes the end of the lever *V* to move, carrying with it the locking-rod *W*, each bolt 13 of which is thus caused to enter a
95 hole 14 in its appropriate rack, thereby preventing any movement of the rack. This movement of the lever also throws the free end of the lever *V* toward the wheel *R* and almost
100 into contact with it. When the shaft *X*, carrying this wheel, is finishing a revolution, the inclined lug 25 on the wheel *R* comes against the shoulder 23 of the lever *V*, Fig. 1, thereby
105 forcing that end of the lever out. This movement of the lever *V* slides the locking-rod *W* back sufficiently to disengage the locking-bolts 13 from the racks *A*, and also moves the lever *V'*, the free end *V²* of which forces the
110 pin *W'* out in time to stop the movement of the crank at the end of its revolution. A projection or head on the inner end of the pin prevents it from coming entirely through the case.

For the purpose of displaying each number added the indicating-wheels 26, Fig. 1, are
115 employed. These wheels are the size of the setting-wheels *I*, and are provided with teeth for the purpose of engaging them. A band attached to one side of each indicating-wheel gives space for the numerals from "0" to "9,"
120 inclusive, which are placed at equal distances from each other and in such relation to the setting-wheels that a movement of the racks *A*, which sets the setting-wheels for the addition of any number, brings the same number
125 on the indicating-wheels into view through an opening provided for the purpose.

In order that any number may be indicated on the side of the machine opposite the operator, the reverse indicating-wheels 27 are
130 used. These wheels are operated, respectively, by the units, tens, hundreds, and thousands indicating wheels in the following manner:

The reverse units-indicating wheel is rigidly attached to a shaft 28 at or near its end. This shaft rotates in bearings in the frame of the machine and has also rigidly attached to

it the units-indicating wheel. It will be seen that any movement of the units-indicating wheel will cause a corresponding movement of the reverse units-indicating wheel, thereby bringing into view at the point desired the appropriate one of the numerals from "0" to "9" arranged on the periphery of the reverse units-indicating wheel. In a similar manner the tens-indicating wheel and the reverse tens-indicating wheel are mounted on a sleeve 29, which revolves on the shaft 28. The hundreds-indicating and reverse indicating wheels are mounted on a sleeve 30, which revolves on the tens-sleeve 27, and the thousands-indicating and reverse indicating wheels are mounted on a sleeve 31, which revolves on the hundreds-sleeve.

The mechanism for locking and unlocking the cash-drawer is shown in Fig. 1. The spur-wheel R is rigidly fixed on the shaft X near the end. Journaled on a stud in the frame of the machine and in engagement with the wheel R is the spur-wheel S, of like diameter. Projecting from the side of the wheel S is the pin 7, which operates to unlock the drawer, and the pin 8, which prevents the revolution of the shaft while the drawer is unlocked, as will be more fully explained.

Pivoted to the frame of the machine at 4 is the latch T, having the catch 1, the stop-arm 2, and the lifting-arm 3. When the shaft X is in its normal position of rest, the catch 1 rests in the socket 10 of the cash-drawer F, thus locking the drawer, and the lifting-arm 3 is in position to be engaged by the pin 7 when the wheel S shall have nearly completed a revolution. The catch 1 has projecting from its side the spring-dog 6, designed to be pressed back into a recess in the catch by contact with the stop 5 on the drawer when the catch is lifted out of its socket and to spring back after the catch has passed the stop, thus preventing the catch from again descending into the socket. The stop 5 has its under side beveled to facilitate the passage of the spring-dog 6 and is attached to the drawer F, and when the latter is opened the removal of the stop allows the catch 1 to fall upon the prop 9. This prop is pivoted to the frame of the machine and is held against the back of the drawer by a spring 11. As the drawer is opened the prop is forced forward by the spring until its upper end is in position to support the catch 1 as the latter falls off the stop 5. The prop is held in this position by a suitable stop-pin 12 on the end of the prop, which engages the bottom of the casing, and when the drawer is again closed is forced back into its original position, thus permitting the catch to fall into the socket 10 and lock the drawer. The catch 6 escapes the stop 5 by being below the same on the prop. When the shaft X is revolved nine-tenths of a revolution, it brings the pin 7 on the wheel R against the lifting-arm 3, and as the revolution is completed the pin lifts the latch T by contact with the trip out of the socket 10, thus liberating the cash-

drawer, which is thrown open by the spring 11. One end of this spring is fixed to the frame of the machine and the other end presses against the back of the prop, which rests against the drawer when the latter is closed. When the revolution of the shaft X is completed, the pin 7 has cleared the lifting-arm 3, and this allows the catch 1 to rest either upon the stop 5 or the prop 9. When the latch is in this position, the stop-arm 2 is immediately in front of the pin 8 on the wheel S, thus preventing any motion of that wheel, and consequently of the shaft X.

When the machine is ready for its first operation the indicating and adding wheels show "0" at the openings provided for the purpose, and the pointers of the racks are at zero on the index-plates. The pawls or bolts d are in such a position that a complete revolution of the shaft X will carry them by the disengaging-posts during the last tenth of the revolution. The lugs c are in such position that a complete revolution of the shaft X will bring the bolts d against them at the beginning of the last tenth of the revolution, and just before the pawls reach the disengaging-posts the carrying sleeves G G' G^2 are in such position that the teeth will pass the gears n without engaging them, while the spurs m are in position to be acted upon, respectively, by the finger h and the pawls h^2 and h' of the adding-wheels.

The operation of the machine is as follows: Suppose the first number to be added is "3,069." The units-pointer is moved to "9" on its index-plate, the tens-pointer to "6," the thousands-pointer to "3," while the hundreds-pointer is left at "0." These movements of the racks revolve the indicating-wheels so as to show the corresponding figures through the openings in the case of the machine. The movement of the units-rack from "0" to "9" has carried the units-lug c a corresponding distance from its original position at "0"—viz., nine-tenths of a revolution around the shaft X—and has left it so near the units-bolt d that at the beginning of a revolution of the shaft X the bolt d will strike against it and be forced into engagement with the units-adding wheel E. The movement of the tens-rack to "6" has carried the tens-lug c six-tenths of a revolution, or to such a position that the tens-bolt d will strike it during the fourth tenth of a revolution of the shaft X, and thus be forced into engagement with the adding-wheel E'. The hundreds-lug c remains in its original position, and the thousands-lug c has been moved three-tenths of a revolution, so that the thousands-bolt d will strike it and be thrown into engagement with the thousands-adding wheel E³ during the seventh tenth of a revolution of the shaft X. The lugs being in the positions above described, the operation of adding is completed by a revolution of the shaft X. During the first tenth of such revolution the units-bolt d impinges on the units-lug c and is driven into engagement with the units-

adding wheel. During the fourth tenth of the revolution of the shaft the tens-bolt d comes in contact with the tens-lug c and is driven into engagement with the tens-adding wheel E' . During the seventh tenth of the revolution of the shaft the thousands-bolt d is driven into engagement with the thousands-adding wheel E^3 . As the hundreds figure is "0" it is not required that movement be given the adding-wheel by means of the hundreds-bolt, and therefore that bolt does not strike the hundreds-lug c until the last tenth of the revolution, and it is immediately forced out of engagement with the wheel by the disengaging-post a without moving the wheel. After each bolt has been thrown into engagement with the adding-wheel, as just described, the continued movement of the shaft X causes the bolts to carry the adding-wheels until during the last tenth of the revolution the shoulders of the bolts strike against the beveled faces of the disengaging-posts and are released from their adding-wheel. In this case the units-adding wheel has been carried nine-tenths of a revolution, the tens-adding wheel six-tenths, the hundreds-adding wheel no tenths, and the thousands-adding wheel three-tenths. The number now shown on the adding-wheels is "3,069." If now we add "6,931" to the foregoing, the operation of the carrying mechanism and of the first auxiliary adding-wheel and its carrying-wheel will be shown. The first step in this process is to set the racks by bringing their respective pointers to the desired figures on the index-plates. This causes the indicating-wheels to show "6,931" and moves the lug c to corresponding positions. Motion is then given to the shaft. As the hundreds-lug c is set at "9," its bolt d strikes it and is driven into engagement with the hundreds-adding wheel during the first one-tenth of a revolution of the shaft. The next bolt to be thrown into engagement with its adding-wheel is d of the thousands series, which impinges against the lug c during the fourth tenth of a revolution, the thousands-lugs being set at "6." Next follows the action of the mechanism of the tens series, the lug of which is set at "3," and therefore causes the engagement of the tens-bolt with the tens-adding wheel during the seventh tenth of the revolution of the shaft. Finally, the units-bolt strikes the units-lug, which is set at "1," and is caused to engage the adding-wheel during the ninth tenth of the revolution of the shaft. After the adding-wheels are thus engaged by their respective bolts they are each carried a number of tenths of a revolution corresponding to the numeral to be added. By the action just described the units-adding wheel has been carried one-tenth, the tens-adding wheel three-tenths, the hundreds-adding wheel nine-tenths, and the thousands-adding wheel six-tenths of a complete revolution by the time their respective bolts have reached the disengaging-posts and have been disengaged from the wheels. The adding-wheels

at this point register "9,990." The addition is then completed by the action of the carrying mechanism. As the units-adding wheel E enters upon the last tenth of its revolution the pin h engages one of the spurs m and carries the sleeve G around until one of the segmental gears n is in a position to be engaged by the teeth t on the arm D' , and as the bolts d begin to disengage from the adding-wheels the teeth t engage the teeth of the segment n . When the disengagement of the bolts from the adding-wheels is completed, the teeth t have turned the sleeve G to a point where one of the arms o is in engagement with the tens-adding wheel E' . As the shaft X completes the last tenth of its revolution the tens-adding wheel is carried by the arm o one-tenth of a revolution and brought to exhibit a cipher and the arm o clears it. Meanwhile the first motion of the tens-adding wheel produced by the arm o has brought the spring-pawl h' into engagement with one of the spurs m , thereby revolving the tens-sleeve G' sufficiently to bring the teeth of one of the segments n into engagement with the teeth t , which are at the same instant brought by the revolution of the shaft X into such engagement. During this engagement one of the arms o is brought into engagement with the hundreds-adding wheel E^2 and causes it to make one-tenth of a revolution, thus bringing it to exhibit a zero. The first motion of the hundreds-adding wheel has brought the spring-pawl h^2 into engagement with one of the spurs m of the hundreds-sleeve G^2 , and action similar to that which took place in the case of the tens-sleeve has caused the arm o to move the thousands-adding wheel one-tenth of a revolution and bring it to "0." The movement of the thousands-adding wheel E^3 , caused by the arm o , has carried the pin h^3 into engagement with the first auxiliary carrying-wheel w and driven the latter a sufficient distance to cause it to move the first auxiliary adding-wheel H one-twentieth of a revolution. This has caused the wheel H to register "1," and thus the sum of the addition, which is "10,000," is registered. In cases where "9" is registered on the tens-adding wheel and "10" is to be added to the wheel by the combined action of the tens-bolt d and the carrying mechanism—as, for example, when "95" is registered on the adding-wheels and "95" is to be added thereto—the spring-pawl h' comes into position ready to engage one of the spurs m before the spur has come around into the position for such engagement. In such cases the spur must get by and in front of its spring-pawl. To effect this, it bears upon and depresses its pawl sufficiently to get by it, and as soon as it has passed the spring brings the pawl into its proper position to engage with its spur. The pawl is prevented by a stop-pin from being forced too far by the spring. The action in case of the hundreds-wheel is the same under similar circumstances.

I do not desire to limit my invention to a cash-register in which a complete revolution of an adding-wheel makes an addition of ten, as practically the same mechanism can be applied to a machine where a complete revolution of an adding-wheel makes an addition of twenty or of any multiple of ten.

I claim—

1. In a register, the combination of an actuating-shaft, adding-wheel and setting-wheel, both loosely sleeved upon said shaft, a setting device for rotatorily adjusting said setting-wheel, a movable connection between said shaft and adding-wheel, actuated by said setting-wheel, a stationary stop for dissolving the connection, and a carrying mechanism actuated after said dissolution, substantially as described.

2. In a register, the combination of an actuating-shaft, a series of totalizing adding-wheels and setting-wheels, all of which are loosely sleeved upon said shaft, setting devices for rotatorily adjusting said setting-wheels in relation to the amount to be registered on the adding-wheels of lowest denominations, a connection between said shaft and adding-wheels actuated by said setting-wheels, a fixed stop for dissolving the connection, and carrying mechanism actuated after said dissolution, substantially as described.

3. In a cash-register, the combination, with an actuating shaft and means by which the shaft is actuated, of adding-wheels loosely mounted on the shaft, setting-wheels loosely mounted on the shaft adjacent to the adding-wheels, means actuated by the setting-wheels for forming connections between the shaft and adding-wheel, movable rack-bars for rotating the setting-wheels, means for dissolving the connection, and carrying mechanism actuated subsequent to the dissolution, substantially as described.

4. In a cash-register, the combination, with the actuating-shaft and adding-wheels loosely mounted thereon, of a setting device consisting of wheels mounted on the shaft, having inclined bearings thereon rotatorily adjustable beside said adding-wheels, rack-bars for independently adjusting said setting-wheels, pawls carried by said shaft and actuated by said bearings, and stationary stops for moving the pawls back into the path of the bearings, substantially as described.

5. In a cash-register, the combination, with the casing, the actuating-shaft, and adding-wheels carried by the shaft, of a setting device consisting of wheels having inclined bearings thereon and rotatorily adjusted on the shaft beside said adding-wheels, rack-bars for adjusting said setting-wheels, mechanism carried by said shaft actuated by said bearings to engage said adding-wheels, handles on said racks, indexes having corresponding numbers to the number on the adding-wheel, fixed stops for disengaging the said mechanism,

and carrying mechanism independently supported relative to and actuated by the shaft, substantially as described.

6. In a register, the combination of an actuating-shaft, a series of adding-wheels on the same, and setting means loosely sleeved upon said shaft, a setting device for rotatorily adjusting said setting means in relation to the adding-wheels of lowest denomination, a movable connection between said shaft and adding-wheels, carried by the shaft and actuated by said setting-wheels, and carrying mechanism for the adding-wheels, located to one side and operated subsequent to the operation of the adding-wheels, substantially as described.

7. In a register, the combination of an actuating-shaft, a series of adding-wheels and a setting-wheel, all of which are loosely sleeved upon said shaft, a setting device for rotatorily adjusting said setting-wheel in relation to the adding-wheel of lowest denomination, a movable connection carried by the shaft between said shaft and adding-wheel, actuated by said setting-wheel, a stop for dissolving said connection, and carrying actuating mechanism on said shaft in the rear of said connection for acting after the dissolution of said connection, substantially as described.

8. In a register, the combination of a rotary shaft, a series of adding-wheels upon said shaft, engaging mechanism carried by the shaft and intermediate between said shaft and each of said wheels, setting mechanism adapted to throw said engaging means into engagement differentially, and a lock for such setting mechanism during the rotation of the actuating-shaft, substantially as described.

9. In a cash-register, the combination, with an actuating-shaft, of a series of register-wheels loosely mounted thereon, a series of setting-wheels loosely mounted on the shaft, pinions on the setting-wheels, engaging means carried by the shaft and actuated by the setting-wheels, means for actuating the setting-wheels by engagement with the pinions, a lock for said actuating means, and a connection between the lock and actuating-shaft, substantially as described.

10. In a register, a rotary actuating-shaft, an adding-wheel and a setting-wheel journaled upon said shaft, a pinion secured to said setting-wheel, setting mechanism and a lock applied to the setting mechanism during the movement of the actuating-shaft, and means for disengaging said lock at the completion of such movement, substantially as described.

11. In a register, the combination, with the actuating-shaft, adding-wheels loosely mounted thereon, and setting mechanism, of a pawl carried by said shaft arranged to engage one of said wheels, a movable lug carried by the setting mechanism, engaging the pawl for throwing the pawl into engagement with the adding-wheel, and a stationary stop with

which the pawl engages for throwing the pawl out of engagement with the adding-wheel, substantially as described.

12. In a register, the combination, with the 5 actuating-shaft, adding-wheels loosely mounted thereon, and setting mechanism, of a pawl carried by said shaft adapted to engage with one of said wheels, a movable lug carried by said shaft and controlled by the setting mechanism for throwing the pawl into engagement 10 with the wheel, and a stationary stop for throwing the same out of engagement with the said wheel, substantially as described.

13. In a cash-register, the combination, with 15 a rotary actuating-shaft, of a series of adding-wheels loosely mounted thereon, means rigid on the shaft for moving said wheels as the shaft is turned, a stationary stop arranged to disengage said means prior to the complete 20 revolution of the shaft, and a carrying mechanism actuated by the moving means during the continued movement of the shaft subsequent to the movement of the wheels, substantially as described.

14. In a cash-register, the combination, with 25 a rotary shaft carrying a series of adding-wheels, means for causing an independent and limited rotation of the wheels, and a carrying mechanism, of an intermediate connection rigid on the shaft for actuating said carrying mechanism, substantially as described. 30

15. In a cash-register, the combination, with an actuating-shaft, of adding-wheels loosely mounted thereon, a pawl mounted on a suitable arm rigid on the shaft, a rotary setting 35 mechanism on the shaft, an inclined bearing on the setting mechanism, engaging the pawl, and stationary means for forcing the pawl back, substantially as described.

16. In a cash-register, the combination of a 40 sleeve *G*, having the spurs *m m*, the mutilated pinions *n n*, and the arms *o o*, in combination with an adding-wheel having finger *h* and an arm having teeth *t* engaging said pinion, substantially as described. 45

17. In a cash-register, the combination, with a shaft carrying a series of two or more adding-wheels rotating freely thereon and a movable series of segmental spur gear-wheels rigidly fixed on the shaft alternately with the 50 adding-wheels, of an arbor parallel to the shaft and carrying the mechanism by which each higher adding-wheel is caused to make one-tenth of a revolution whenever the adding-wheel next below it has made a complete revolution, substantially as described. 55

18. In a cash-register, the combination, with a register-actuating shaft carrying a crank, of means for setting the register, a lock for 60 said means, a sliding pin arranged in the path of the crank, and means for locking the pin in the path of the crank and simultaneously unlocking the setting means, substantially as described.

19. In a cash-register, the combination, with 65 the actuating means, of a cash-drawer, a lock for the drawer, means actuated by the actuating means for unlocking the drawer, and a stop on the drawer-lock, engaging the unlocking means for preventing the movement of 70 the actuating means, substantially as described.

20. In a cash-register, the combination, with the register-actuating means, of a cash-drawer, a lock therefor, means actuated by 75 said actuating means for unlocking the drawer, and means carried by the drawer-lock for preventing the movement of the actuating mechanism when the drawer is unlocked, substantially as described. 80

21. In a cash-register, the combination, with the register-actuating means and means for setting the register, of a lock for the setting means, a lock for the actuating means, and mechanism for alternately actuating the locks, 85 substantially as described.

22. In a cash-register, the combination, with an actuating-shaft, of adding and setting wheels mounted loosely thereon, movable means carried by the shaft, actuated by the 90 setting-wheels to engage the adding-wheels, a carrying mechanism, and means on the carrying mechanism alternately actuated directly by the adding-wheels and shaft, substantially as described. 95

23. In a cash-register, the combination, with the adding-wheels and a shaft for actuating the same, of a carrying mechanism independent of the shaft, means on the carrying mechanism engaged by the adding-wheels, and a 100 fixed projection on the shaft, engaging the carrying mechanism subsequent to the engagement of the same and adding-wheels, substantially as described.

24. In a cash-register, the combination, with 105 an actuating-shaft and registering mechanism, of a carrying mechanism independent of the shaft, means actuated by the shaft to set the carrying mechanism, and means on the shaft for actuating the carrying mechanism 110 subsequent to the setting thereof, substantially as described.

25. In a cash-register, the combination, with the registering means, of a totalizing-register-actuating means, a setting device for the 115 totalizing-register-actuating means, and means operated by the operation of the register to actuate the totalizing-register-actuating means, substantially as described.

In testimony that I claim the foregoing as 120 my invention I have signed my name, in presence of two witnesses, this 17th day of February, 1890.

CHANNING PAINE.

Witnesses:

W. D. THURMOND,
E. G. BUCHANAN.