

F. F. AKERLY.
MARKING, REGISTERING, AND RECORD PRINTING MACHINE.
APPLICATION FILED AUG. 3, 1914.

1,167,733.

Patented Jan. 11, 1916.

11 SHEETS—SHEET 1.

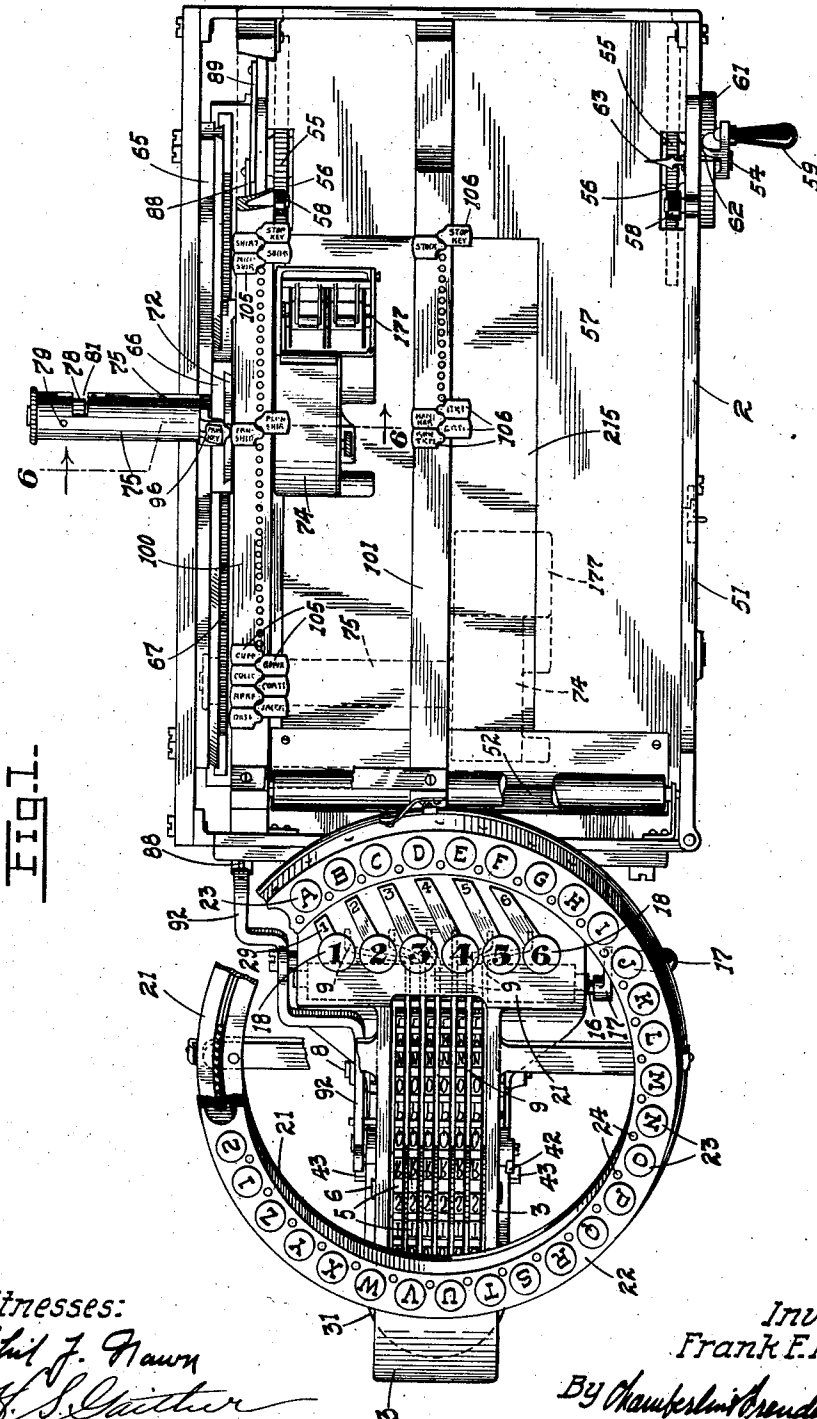


FIG. 1.

Witnesses:

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H. S. Gutter

Inventor:
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Att'y's.

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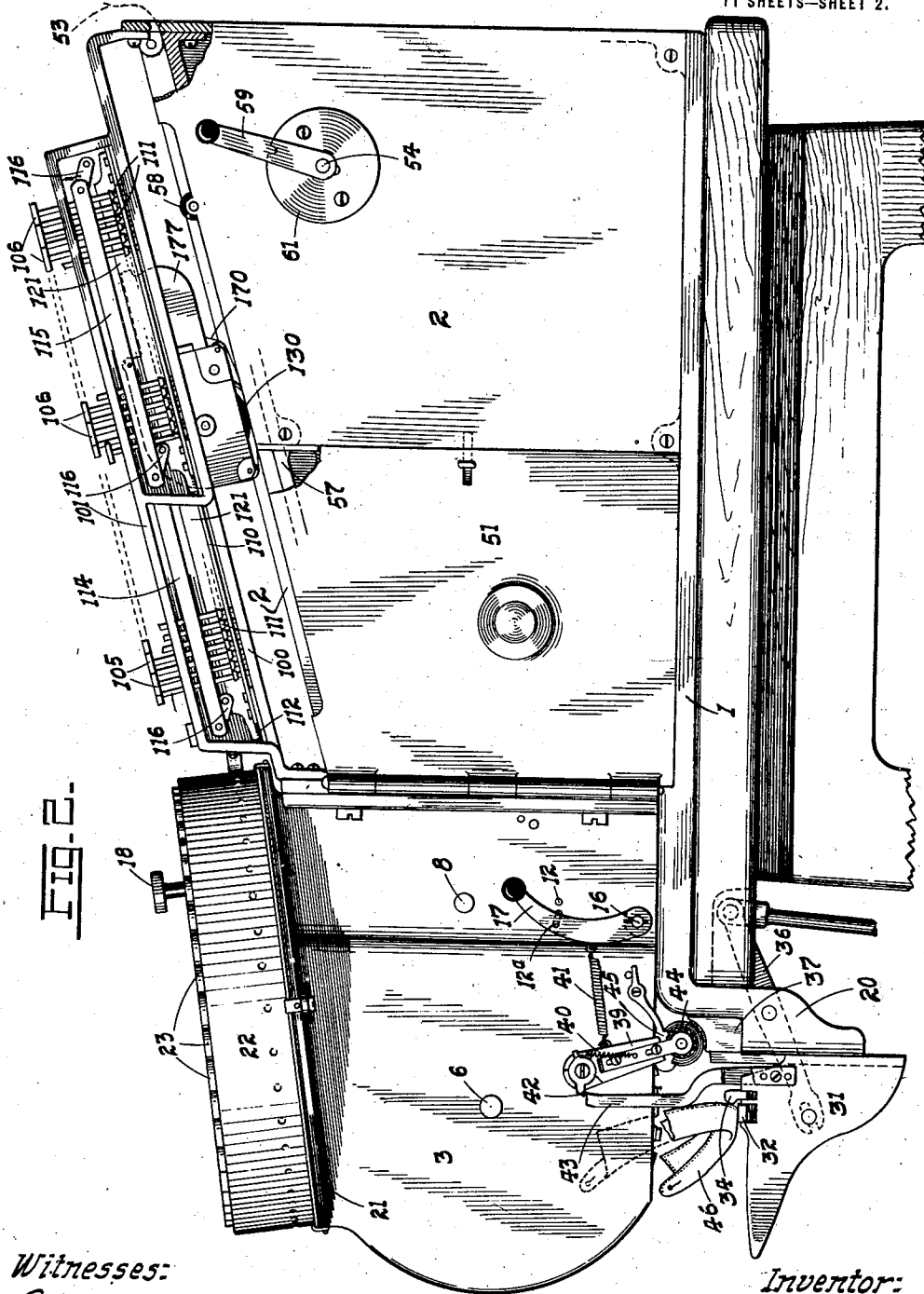


FIG. 2.

Witnesses:

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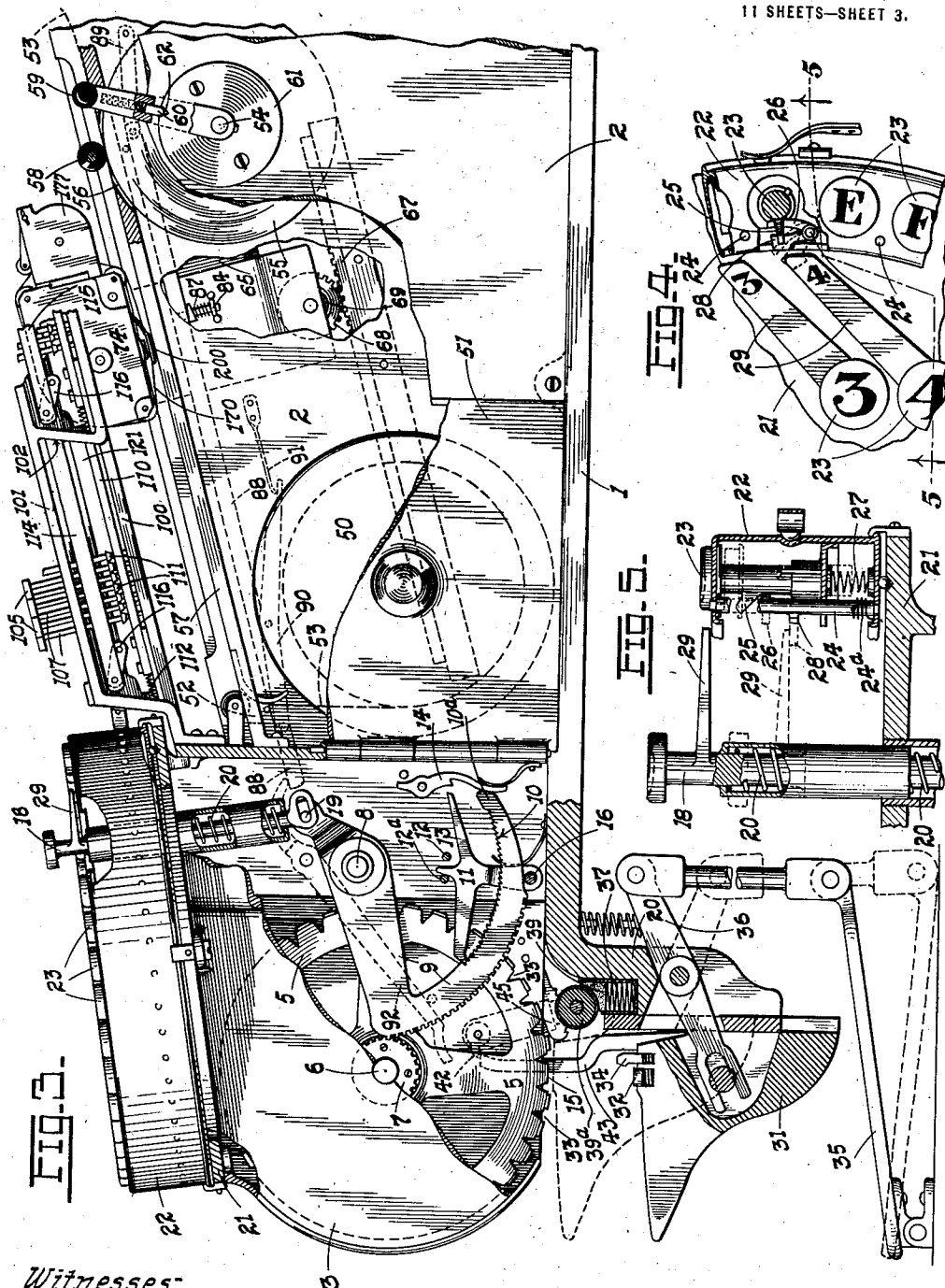
By Chamberlain & Prendergast
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11 SHEETS—SHEET 3.



Witnesses:

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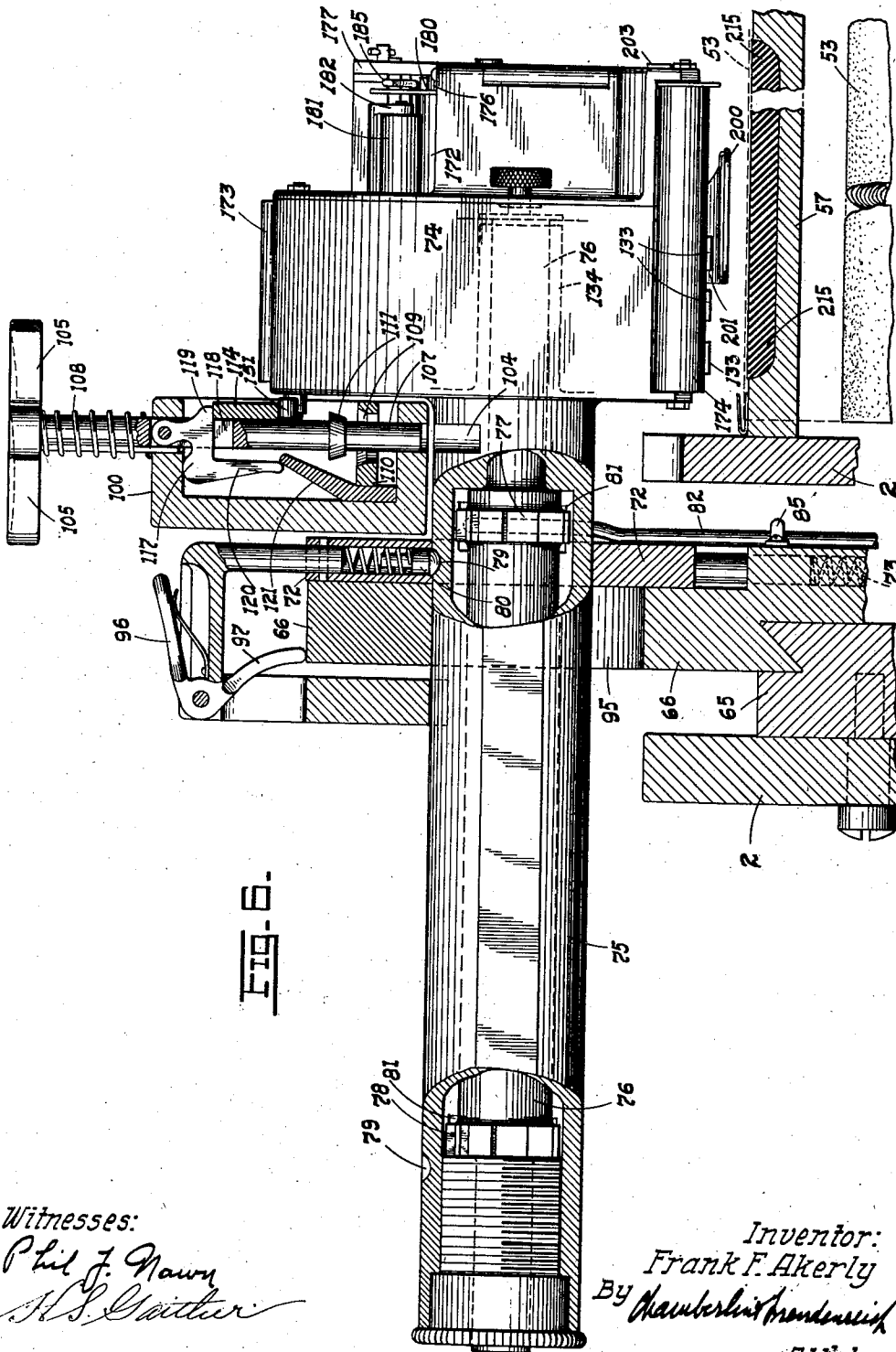
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11 SHEETS—SHEET 4.



Witnesses:

Phil J. Hawry
H. S. Gaither

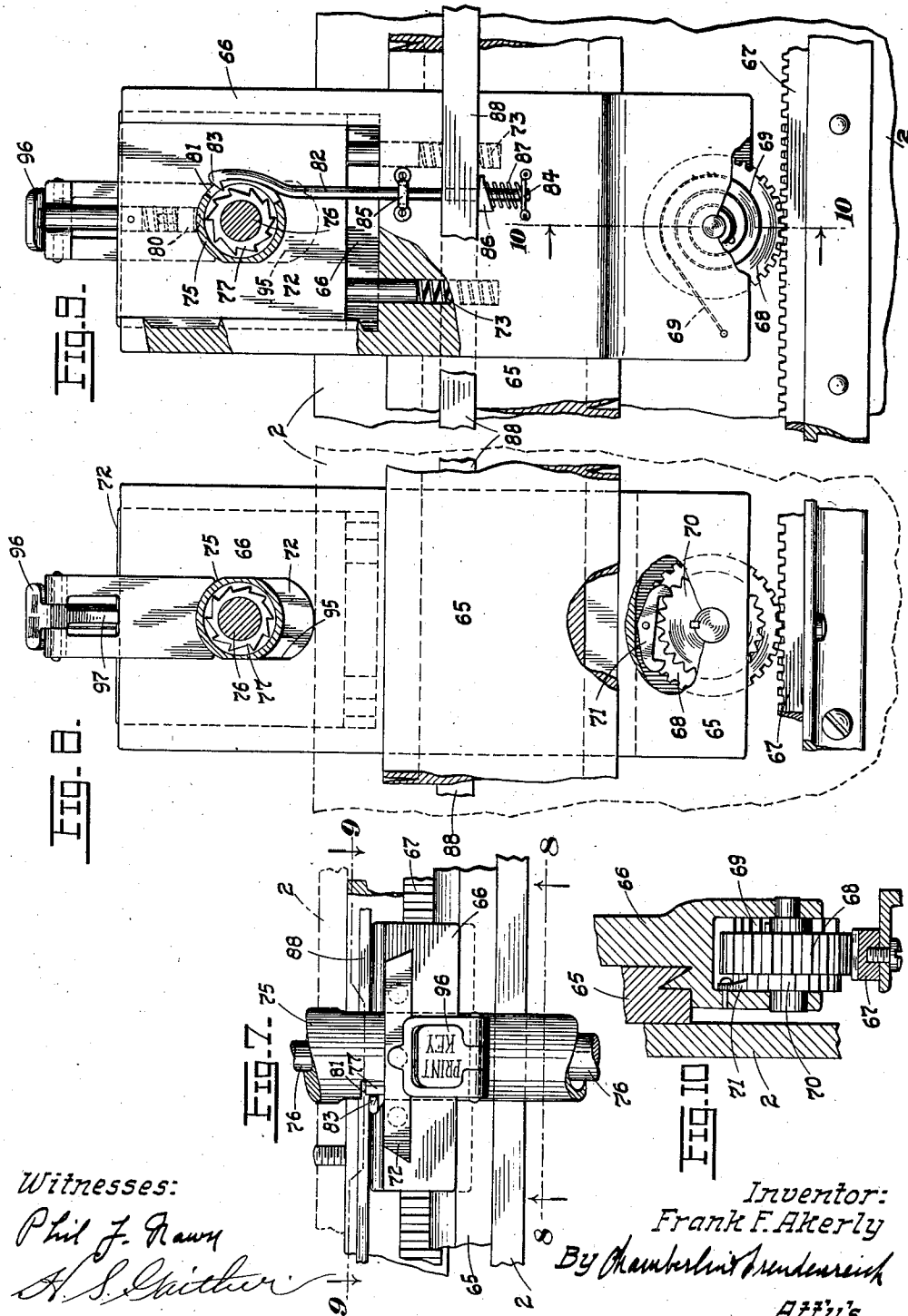
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11 SHEETS—SHEET 5.



Witnesses:

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11 SHEETS—SHEET 6.

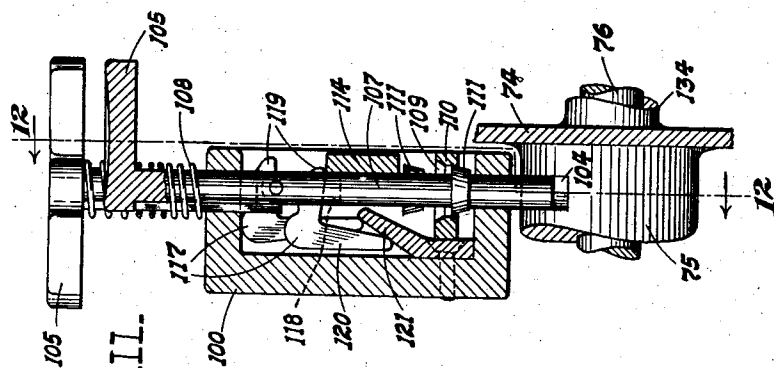


FIG. 11.

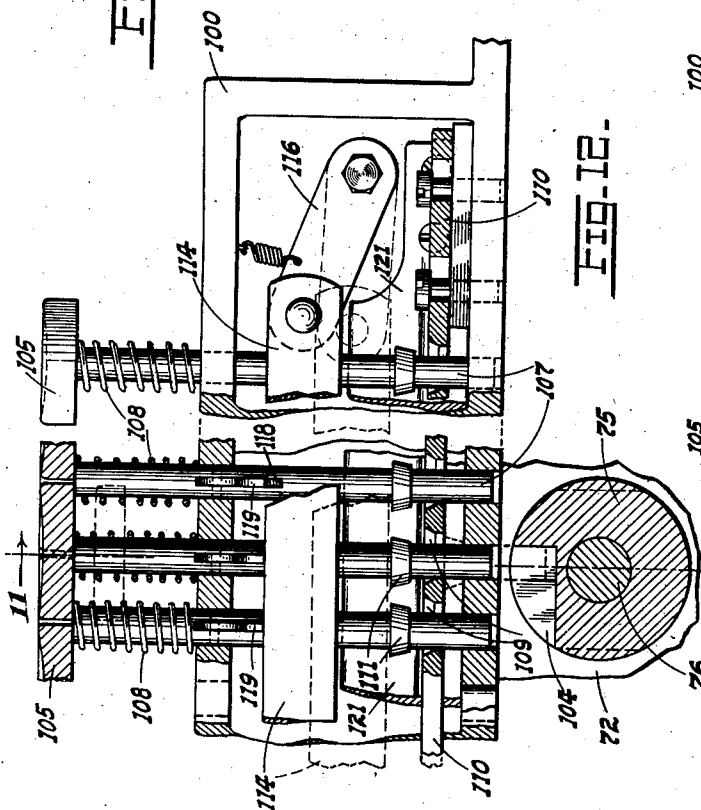


FIG. 12.

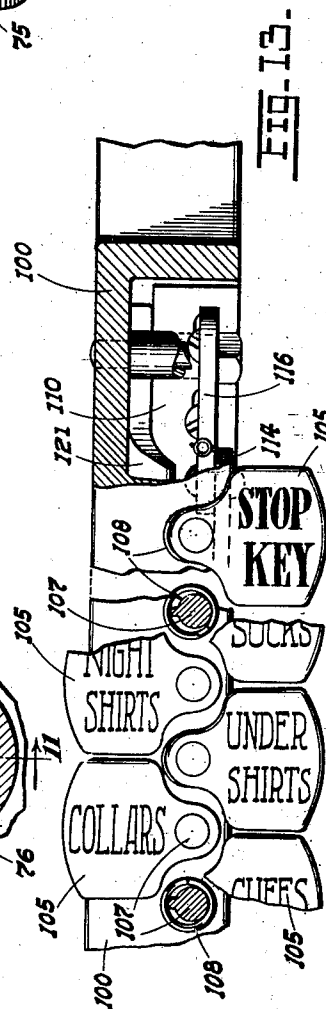


FIG. 13.

Witnesses:

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11 SHEETS—SHEET 7.

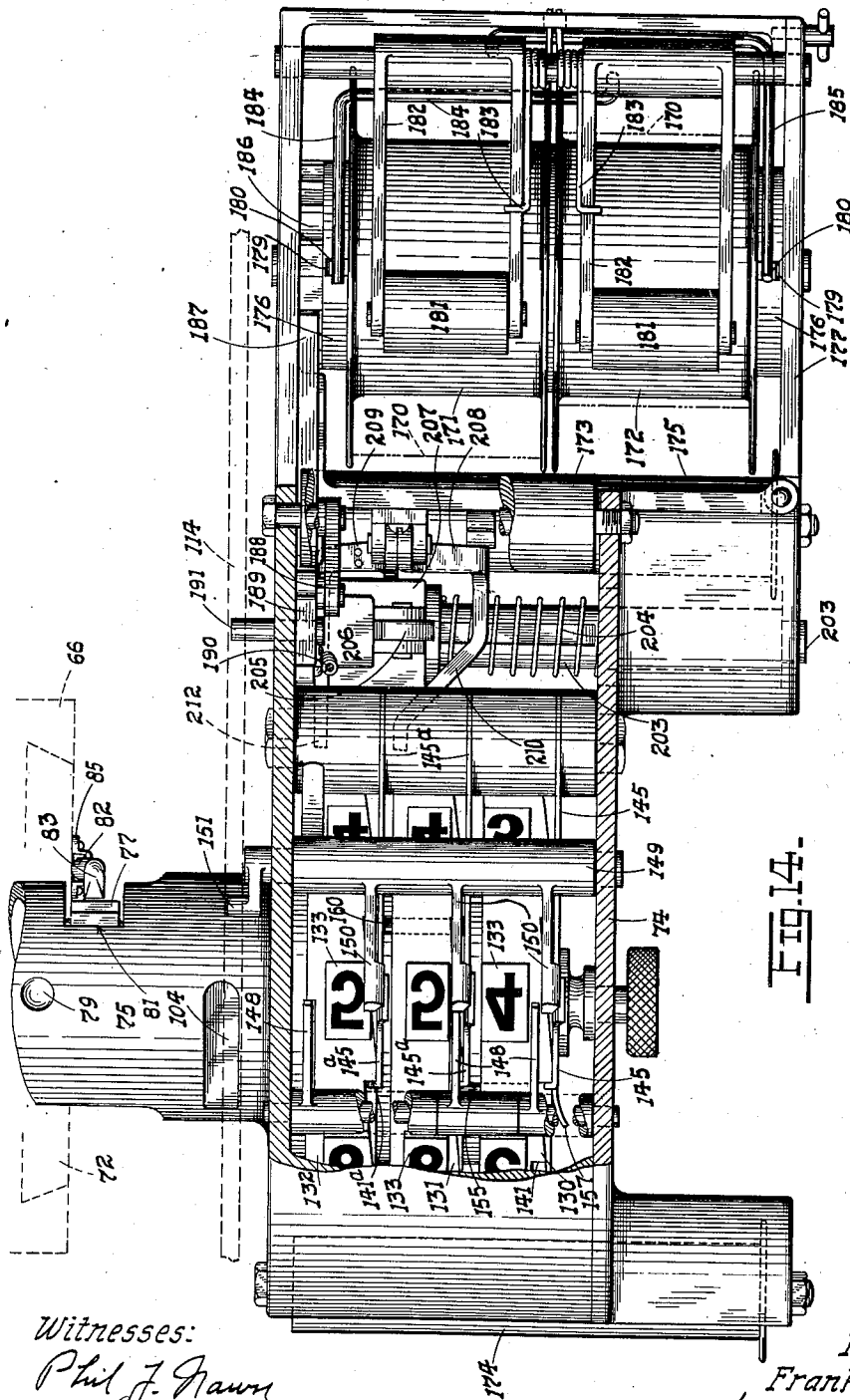


FIG. 14.

Witnesses:

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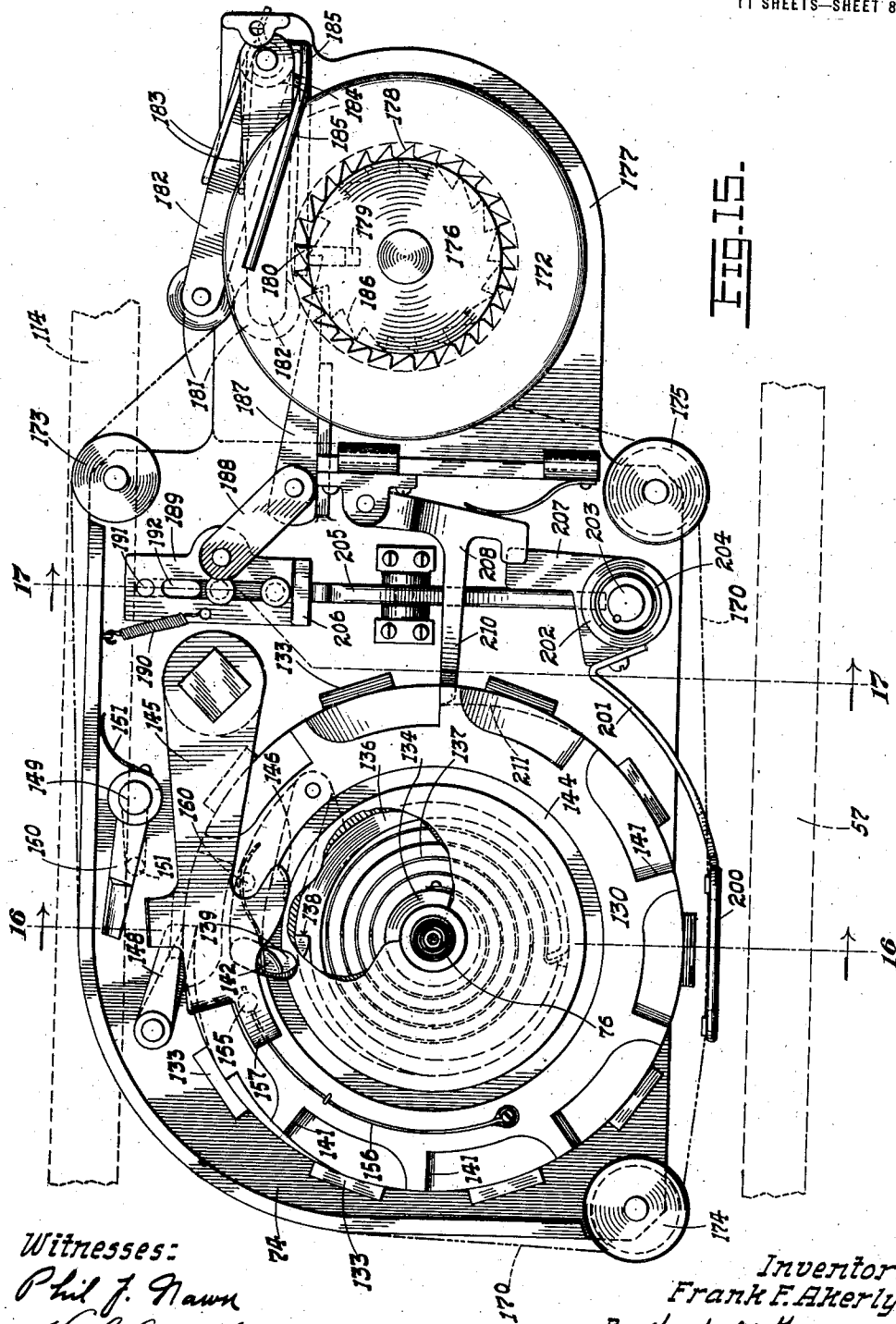


FIG. 15.

Witnesses:

Phil J. Nawn
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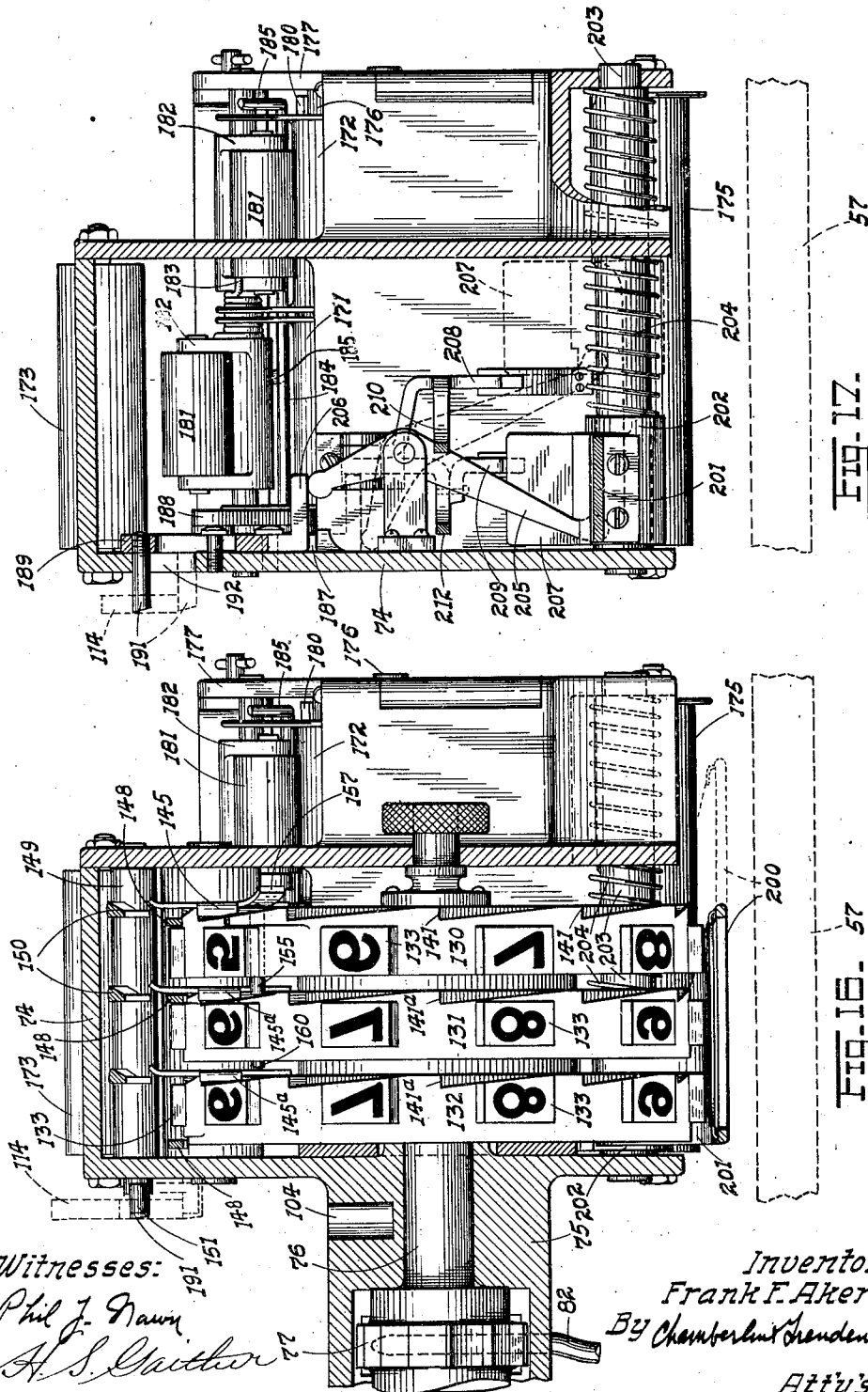
Inventor:

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APPLICATION FILED AUG. 3, 1914.

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11 SHEETS—SHEET 9.



Witnesses:

Phil J. Gawn

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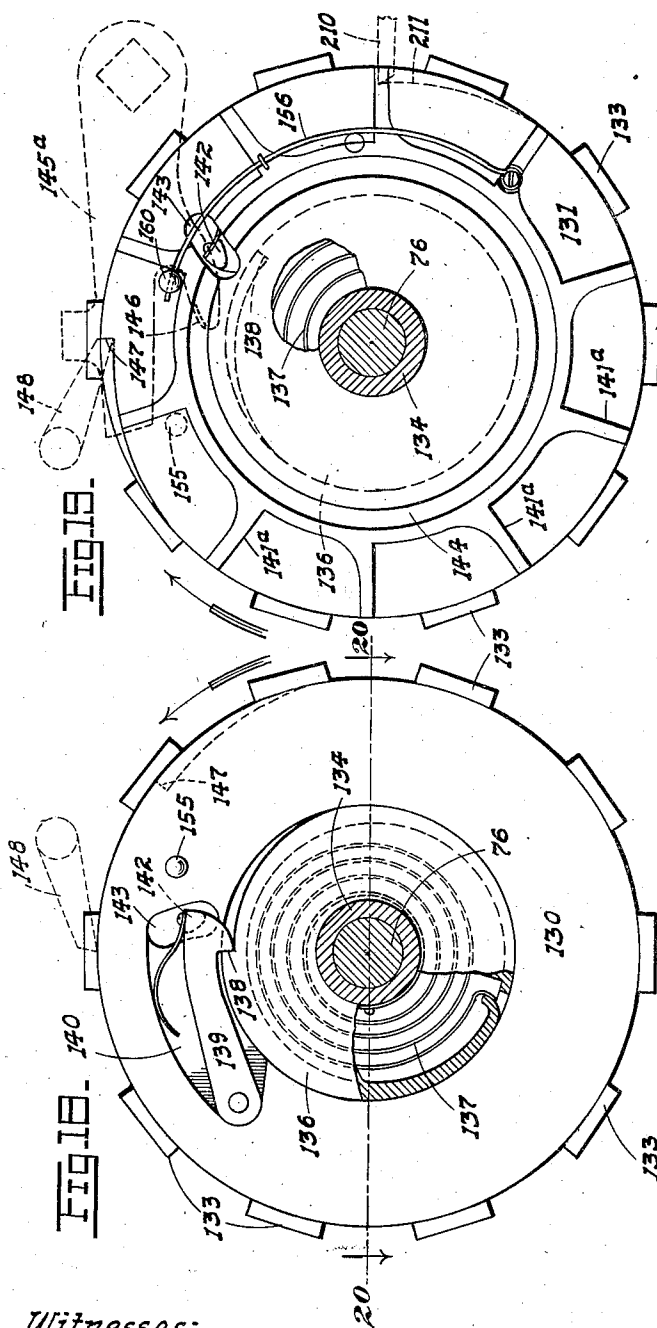
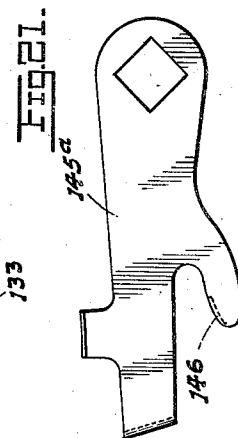
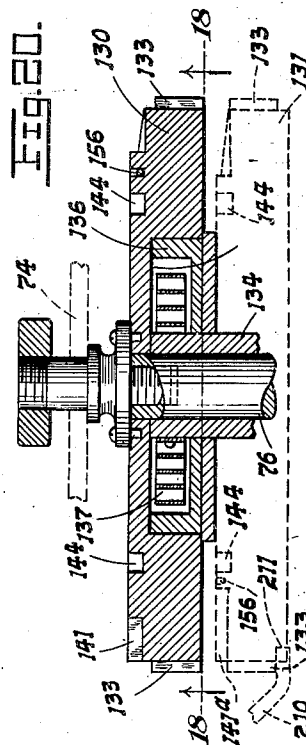
Inventor:
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11 SHEETS—SHEET 10.



Witnesses:

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H. S. Carter

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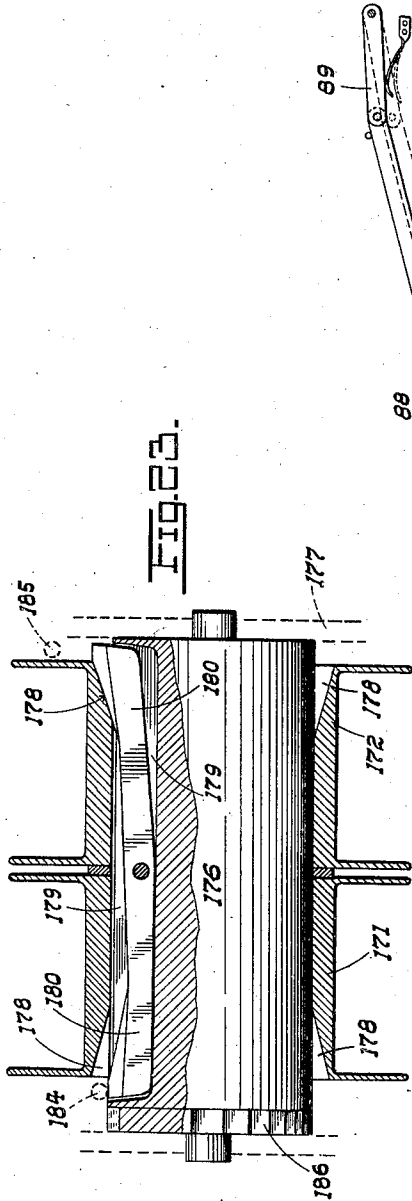
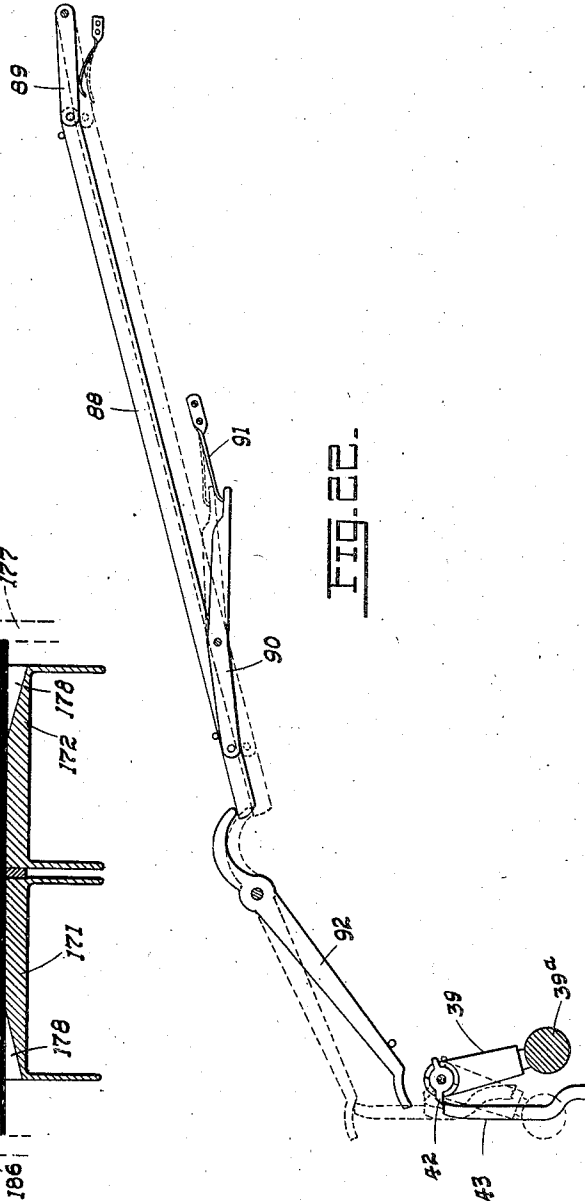
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11 SHEETS—SHEET 11.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANK F. AKERLY, OF CHICAGO, ILLINOIS.

MARKING, REGISTERING, AND RECORD-PRINTING MACHINE.

1,167,733.

Specification of Letters Patent.

Patented Jan. 11, 1916.

Application filed August 3, 1914. Serial No. 854,746.

To all whom it may concern:

Be it known that I, FRANK FREEMAN AKERLY, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Marking, Registering, and Record-Printing Machines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Considered as a whole my invention may be said to relate to the art of marking and recording articles of various kinds as, for example, articles reaching a laundry for the purpose of being laundried. Thus, when a bundle of clothing or other articles is delivered to the laundry, each article must be marked and counted and a list made of all the articles in the bundle. This is slow, tedious work and, in a laundry of any considerable size, requires the service of a considerable number of competent clerks.

Viewed in one of its aspects, my invention may be said to have for its object to make the work of counting, marking and recording articles to a large extent automatic so that a single person may readily do the work which has heretofore required the services of several persons and, at the same time, there will be greater accuracy and neatness in the list or other record than where the work is all done manually.

I attain the main object of my invention by constructing a machine which will mark an article in any suitable way and at the same time act upon a combined registering and printing mechanism adapted to be operated to print on a list or ticket whenever all of the articles of one kind or in one group have been marked. Therefore, viewed in another of its aspects, my invention may be regarded as having for its object to produce a simple and reliable machine for marking articles, counting them and making a record thereof; or, as viewed in another of its aspects, to produce a simple and novel marking mechanism; or, as viewed in another of its aspects, to produce a simple and novel counting or registering and printing mechanism.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in

the claims; but for a full understanding of my invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

Figure 1 is a top plan view of a machine arranged in accordance with one form of my invention, a section of one of the parts being broken away; Fig. 2 is a side elevation of the machine looking upwardly from the bottom of Fig. 1; Fig. 3 is a view similar to Fig. 2, parts being, however, shown in section and other parts being broken away; Fig. 4 is a view on an enlarged scale of a fragment of the setting mechanism for the laundry marking devices, parts being broken away to expose other parts normally concealed; Fig. 5 is a section taken approximately on line 5—5 of Fig. 4; Fig. 6 is a section on an enlarged scale taken approximately on line 6—6 of Fig. 1; Fig. 7 is a top plan view of a fragment of the counting and printing mechanism with the adjacent supporting means therefor; Fig. 8 is a section taken approximately on line 8—8 of Fig. 7; Fig. 9 is a section taken approximately on line 9—9 of Fig. 7; Fig. 10 is a section taken approximately on line 10—10 of Fig. 9; Fig. 11 is a section taken approximately on the same plane as Fig. 6, but showing only the position controlling devices for the registering and printing mechanism. This figure may also be regarded as a section on line 11—11 of Fig. 12; Fig. 12 is a section taken approximately on line 12—12 of Fig. 11; Fig. 13 is a top plan view of the parts shown in Figs. 11 and 12, partly broken away; Fig. 14 is a top plan view, on an enlarged scale, of the registering and printing mechanism, with a portion of the casing removed; Fig. 15 is a side elevation of the mechanism shown in Fig. 14 looking upwardly from the bottom of Fig. 14, and the side member of the casing being removed; Fig. 16 is a section taken approximately on line 16—16 of Fig. 15; Fig. 17 is a section taken approximately on line 17—17 of Fig. 16; Fig. 18 is a view of the unit wheel of the registering mechanism looking at the side next to the tens wheel; Fig. 19 is a view of the tens wheel looking at the side next to the unit wheel; Fig. 20 is a section taken approximately on line 20—20 of Fig. 18 with the tens wheel shown in dotted lines; Fig. 21 is a side elevation of the main pawl for the tens and hundreds wheel;

Fig. 22 is a view of the connections between the marking mechanism and the counting mechanism detached from the rest of the machine; and Fig. 23 is a section through the spools on which the ribbon of the registering and printing mechanism is wound.

In the drawings I have illustrated my invention as embodied in a machine designed particularly for marking laundry articles, counting the articles of each kind, and making a printed record on the usual laundry list and, for the sake of brevity, I shall confine the detailed description to this particular machine and to the particular use for which this machine has been designed; but I desire to have it understood that my invention is not limited to marking or counting or recording laundry articles nor is it limited to a machine in which all of the aforesaid operations are combined.

Reference being had to the drawings, 1 represents a suitable flat base on the front of which is mounted suitable marking mechanism while upon the rear portion is a casing or housing, 2, for containing a roll of laundry lists and on top of the housing, in position to print on the lists one at a time, is a suitable counting or registering and printing mechanism.

The laundry marking mechanism is of the type adapted to print suitable designating characters either upon the articles themselves or upon tags on the articles. In the arrangement shown, there is arranged on top of the front portion or the base of the machine a suitable casing, 3, projecting beyond the end of the base and open on the under side throughout the projecting portion. Within the casing are arranged a series of wheels or disks, 5, six in number, all loosely mounted on a transverse shaft, 6. Each of the wheels or disks has on one side a thin pinion, 7, which spaces it from the adjacent disk or wheel. Each disk or wheel has on the periphery a series of characters, in the present instance the letters of the alphabet and numerals from 1 to 9. Extending across the casing 3 behind the set of marking wheels is a shaft, 8, on which are mounted a series of segments, 9, corresponding in number to the marking wheels and each having teeth which mesh with the teeth on one of the pinions. Each of the segments is also provided with ratchet teeth, 10, adapted to be engaged by a suitable pawl, 11, to hold the segment against movement in one direction. The oscillatory movements of the pawls 11 are limited by two parallel rods, 12 and 12^a, extending across the casing 3, one on each side of a nose or projection on each of the pawls. The angle through which the pawls may oscillate is greater than that required to permit the pawls to ride over the ratchet teeth so that when the pawls are retracted as far as they will go, a finger, 13,

on each will catch under a spring pressed dog, 14, when the latter is in the proper position and the pawls will be held out of operative relation to the ratchet teeth. When the segments are in their normal positions, that is the positions which they occupy when the blank space, 15, on the corresponding marking wheel is lowermost, the segments contact with the dogs 14 and hold them back clear of the pawls even though the pawls be at the limit of their rearward movement. The pawls, 11, are loose upon a shaft, 16, which projects through the casing and has journaled thereon a handle 17. The rod 12 behind the pawls, 11, is stationary while the rod 12^a passes at one end through a slot in the wall of the casing 3 and is secured to the handle, 17.

As will hereinafter appear, the segments tend constantly to return to their normal positions, corresponding to the idle positions of the marking wheels, and therefore, whenever the wheels are to be reset to bring them all into their idle positions, the segments are all released by the mere act of grasping the handle 17 and turning it slightly so as to carry the rod 12^a back against the pawls; the pawls being caught under their respective locking dogs 14 so that the handle 17 may be released immediately; and the segments then swinging back to their normal positions and, as they reach these positions, kicking the dogs away from the pawls and permitting the pawls to drop down into operative relation to the ratchets so that the parts are in proper condition to permit the marking mechanism to be re-adjusted. At the extreme end of the ratchet teeth on each of the segments is an inclined face or shoulder, 10^a, of greater depth than the ratchet teeth; each of these faces or shoulders being adapted to engage with the corresponding pawl and swing it back far enough to be caught under the corresponding dog, 14, when the segment is turned as far as it will go from its normal position of rest, leaving the segment free to swing back as soon as the actuating force is removed.

The segments 9 are actuated by means of suitable push rods, 18, each having a pin and slot connection, 19, with one of the segments and each having a spring, 20, which tends to hold it raised and keep the corresponding segment in its normal idle position. The depression of the push rod against the tension of its spring to the proper degree sets the corresponding printing wheel, while the pawl cooperating with the corresponding segment maintains the adjustment until the pawl is released as heretofore described and permits the spring on the push rod to retract all of the parts. Since each marking wheel has a great many different working positions it is necessary that the extent to which the push rods are depressed be nicely regulated.

lated in order that the proper marking characters will be brought to the bottom which is the printing point.

The means for controlling the downward movement of the push rods is as follows: Upon the casing 3 and surrounding the push rods is an annular support or track, 21, on which is mounted an annular carriage, 22. The carriage has distributed about the same a series of push buttons, 23, corresponding in number to the number of printing characters on each of the marking wheels. There are supported in the carriage adjacent to the push buttons a series of rotary rods or shafts, 24, one adjacent to each of the push buttons. Each of the push buttons has thereon a cam-like arm, 25, overlying an arm, 26, on the corresponding rod or shaft, 24. Each push button is held in its raised position by means of a suitable spring, 27. Each of the rods or shafts 24 is provided with a radial lug or projection, 28, arranged at a point along the rod or shaft different from the points at which the lugs or projections on all of the other shafts are located. The parts are so proportioned that normally the springs hold the push buttons raised while springs, 24^a, serve to hold the shafts 24 in such positions that the fingers or lugs are retracted within the carriage. Whenever a push button is depressed, the corresponding rotary rod or shaft is oscillated and its lug or projection is caused to project beyond the inner line of the carriage.

Each of the push rods, 18, is provided with a radial finger, 29, projecting into proximity to the inner edge of the annular carriage. The operation of this mechanism is as follows: Assuming that the push rod "1" controls the unit marking wheel and that it is desired to set this wheel to print the letter "a," the carriage is turned around until the push button *a* is just opposite the end of the finger 29 on the push rod "1"; the push button *a* is pressed down so as to swing the corresponding lug or projection controlled thereby beneath the finger on the push rod; and the push rod is then depressed until its finger engages with the lug or projection beneath it and arrests further movement. The push rod is locked in this position by the pawl and rack heretofore described, so that upon the release of the push button the latter assumes its normal position while the push rod remains locked in its depressed position. The carriage is then turned to bring the desired character opposite the projecting finger on the push rod "2" and the second wheel of the set is adjusted.

In Figs. 4 and 5 I have illustrated in detail sufficient of the structure to show how one of the push rods, the rod "4" is set, the parts being shown in full lines in their

normal positions of rest and in dotted lines in the positions which they occupy when the push button for controlling the extent of depression of the push rod and the push rod itself are depressed.

The peculiar pawl and ratchet holding means for the actuating segments have a valuable function to which no reference has heretofore been made. In setting the several marking wheels, it may happen that one of the wheels is incorrect and will print the wrong character. If it is necessary to turn this wheel forward one or more steps in order to correct its position this can be done in the manner heretofore explained without interfering with the other wheels. If, on the other hand, it is necessary to turn one of the wheels backward through one or more steps, in order to make the correction, the holding pawl for that wheel prevents a direct backward movement; but, by pressing the corresponding push rod down as far as it will go, the holding pawl is kicked clear of the ratchet teeth and is caught under the corresponding locking dog therefor. Consequently, upon again releasing the push rod, the marking wheel whose position is to be corrected flies back to its normal position of rest and, as it reaches this position, the tail end of its actuating segment kicks the dog away from the holding pawl and allows the pawl to drop down into operative relation to the ratchet teeth; so that the wheel may then be set in position to print the proper character, in the manner heretofore described.

At the front of the base member 1 is a vertical depending portion, 30, on which is arranged a vertically slidable shoe, 31, provided with a yieldably supported anvil, 32, which, when the shoe is raised, is adapted to engage with the printing points or line on the marking wheels. The marking wheels are provided with notches or recesses, 33, between the printing characters and the shoe, 31, is provided with a finder or finger, 34, preferably slidably supported in the same way as the anvil 32 and adapted to enter the overlying notches in the marking wheels and, if the wheels should happen to be slightly out of registration, bring them all into registration before the printing surfaces come in contact with the anvil. The shoe 31 may be operated in any suitable way, as, for example, by means of a treadle, 35, connected to one end of a suitable operating lever, 36, whose other end is connected to the shoe.

In the member 30 just behind the shoe 31 is a well, 37, containing a yieldably supported ink pad, 38. Hinged at their upper ends to the sides of the casing 3 are arms, 39, between the lower ends of which is revolvably mounted an inking roller, 39^a. The arms 39 are preferably made extensible, each

having a spring, 40, tending to maintain it in its shortest condition. This insures that the inking roller will always engage the printing surfaces with a yielding pressure when the arms 39 are swung to ink the wheels as will hereinafter be described. A spring, 41, which may conveniently be placed between the handle 17 and one of the arms 39 serves to hold the inking roll normally in engagement with the pad. On each of the arms 39, projecting radially from their pivotal axis is a pawl-like finger, 42, and on the shoe 31 are a pair of upwardly projecting posts, 43, which engage with the pawls as the shoe travels upwardly and positively swing the arms 39 and the inking roller forwardly, carrying the inking roller in contact with the printing surfaces on the marking wheel. This movement of the inking roller is completed and the pawls, by reason of the angular positions which they assume, are allowed to drop off the upper ends of the posts 43 so as to permit the inking roller to recede into contact with the inking pad before the anvil is lifted high enough to interfere with the roller or to be interfered with by the roller. If desired, the inking roller may be provided with a ratchet wheel, 44, engaging with a pivoted toothed member, 45, so constructed that when the inking roller is swung forward to ink the printing characters on the marking wheel, the roller is caused to rotate so as to present the surface which was in contact with the pad while, upon the return movement of the roller, the ratchet teeth simply slip over the teeth on the member 45 and the roller is not turned backward. With this arrangement the roller is progressively turned step by step in one direction.

The marking wheels having been properly set to print the desired characters on a piece of laundry, and the inkwell being supplied with ink; a piece of laundry as, for example, a collar, 46, is laid on the anvil, the treadle is depressed and the shoe carrying the anvil and finder 34 rises, causing the marking wheels to be inked and then to be centered or brought accurately into registration, whereupon the piece of laundry will be pressed between the printing surface and the anvil and will receive the desired impression from the marking wheels. The operation of the treadle to effect the marking of an article also sets or adjusts a combined counting or registering and record printing mechanism which I shall now describe.

In the front end of the main housing or casing 2 is arranged a suitable drum or reel, 50, on which is adapted to be wound a strip of laundry lists suitably printed in the usual way with the names of various articles to be laundried and bearing opposite the names suitable spaces in which the number of articles of each kind may be set. The drum or

reel is revolubly supported between the side walls of the housing, one end being conveniently journaled in a door, 51, adapted to give access to the interior of the housing and to permit the insertion or removal of the drum. A slot, 52, is formed in the top wall of the housing 2 near the front thereof and the strip of laundry lists, 53, is adapted to be passed up through this slot and across the top of the housing to a feeding mechanism by means of which the strip may be placed in position to be marked. In the arrangement shown, the feeding mechanism consists of a shaft, 54, having thereon two fixed knurled disks, 55, which project upwardly through slots 56, in the top wall, 57, of the housing, while suitably supported just above the disks are small rollers, 58, of rubber, fiber or other suitable material. The rollers, 58, press against the knurled disks. On one end of the shaft 54 is a handle, 59, by means of which it may be rotated. It will be seen that by drawing the strip of laundry lists out far enough to bring its free end between the rollers 59 and the disks 55, and turning the handle 59, the strip will be firmly gripped and will be fed forward a distance depending upon the angle through which the operating handle is turned. By making the circumferential length of the disks 55 exactly equal to the length of a single laundry list, it is only necessary to give the handle 59 one complete turn in order to withdraw one list from its position on the printing table formed by the top wall of the housing and replace it by another. If desired, the handle may be provided with a spring actuated pin or dog, 60, which, as the handle is turned, rides upon the periphery of a stationary disk, 61, and, at the end of a complete revolution, drops into a notch, 62, in the periphery of this disk, apprising the operator that a complete change in the lists has been made and serving as a yieldable lock for the handle. In a suitable point, preferably adjacent to one of the feeding disks is placed a suitable fixed pointer, 63, by means of which the positioning of the laundry lists may be accurately effected.

It is customary to place the names of articles on laundry lists in two rows side by side and I have therefore arranged the counting and printing mechanism so that it may be used in connection with lists of this kind, first registering the articles in one row and then in the other row. The top of the housing 2 is inclined, being higher at the back end than at the front and, mounted outside of and parallel with one of the side walls of the housing is a dove tail guide, 65, the upper and lower edges of which are parallel with the top of the housing or printing table. Mounted on the guide and projecting upwardly and downwardly therefrom is a carriage, 66, adapted to be moved

back and forth along the guide in the direction of the length of the printing tables. Below and parallel with the guide 65 is fixed a rack bar, 67, with which meshes a pinion, 68, journaled in the lower end of the carriage 66. Connected at one end to the pinion and at its other end to the carriage is a coiled spring, 69, so disposed that when the carriage is moved up the incline the spring is wound up and therefore exerts a constant tendency to rotate the gear wheel in the direction to move the carriage down the incline. Fastened to the pinion is an escapement wheel, 70, with which coöperates a pallet, 71, adapted to prevent too rapid rotation of the pinion. On the upper portion of the carriage is arranged a vertically movable slide, 72, normally held raised by suitable springs, 73, but adapted to be depressed against the tension of these springs. The slide 72 is adapted to serve as the direct support for the registering and printing mechanism to be hereinafter described. The registering and printing mechanism is arranged in a casing, 74, carried upon one end of an elongated tubular member, 75, which extends through and is supported in the slide, 72, so as to be movable in the direction to carry the registering and printing mechanism transversely across the printing table, the purpose being to permit this mechanism to be shifted into the two positions necessary for printing in two different rows. Extending lengthwise through and revolvably mounted in the member 75 is a shaft, 76, which is the driving shaft for the registering mechanism. On this shaft are two separated ratchet wheels, 77 and 78, spaced apart a distance equal to the distance through which it is necessary to shift the mechanism to enable it to print in both rows on the laundry lists. If desired, the member 75 may be provided with properly spaced depressions, 79, and the guide be provided with a spring pressed pawl or dog, 80, which will drop into one of these depressions or the other as the case may be, and yieldingly lock the registering and printing mechanism against accidental displacement. The tubular member 75 is slotted in proximity to each of the ratchet wheels 77 and 78, as indicated at 81, to permit an actuating pawl to have access to the ratchet wheels. A vertically slidable rod, 82, having at its upper end a nose or pawl, 83, is mounted on the carriage 66 in a position to bring its nose or pawl into alinement with one or the other of the slots 81, depending upon the position which the registering and printing mechanism occupies. The lower end of the rod passes through an eye, 84, which is only loose enough upon the rod to permit the latter to slide up and down, while at an intermediate point the rod passes through an enlarged eye, 85, which permits it to oscillate

so as to carry its pawl toward and away from the ratchet wheel. On the rod 82, at a point between the two eyes is a wedge shaped collar, 86, between which and the lower eye is placed a spring, 87. The under surface of the collar 86 is inclined transversely to the axis and therefore the tendency of the spring is not only to hold the rod raised but also to tilt it back and hold the nose or pawl out of engagement with the ratchet wheel. The upper surface of the collar is also inclined, but in the opposite direction from the lower surface and therefore, when the bar 88, to be hereinafter described, is pressed down upon the collar 86 it tilts the rod 82 against the tension of the spring and carries the nose or pawl into engagement with the ratchet wheel so that upon a further downward movement of the bar, the rod is forced down and turns the ratchet wheel through a distance of one tooth.

The bar 88 to which reference has just been made extends along the side of the main housing 2 parallel with the guide 65 and the rack 67 and is supported at one end upon a link, 89, hung upon the side wall of the main housing and at its other end upon one end of the arm of a lever, 90, which is hung upon the side of the housing at such a point between its ends as to make the arm upon which the bar 88 is supported equal in length to the link 89. A spring, 91, acting on the lever 90 tends normally to hold the bar raised. It will be seen that the bar 88 is movable up and down but, by reason of the manner in which it is supported, must always remain parallel with the guide and the rack so that it will always bear the same relation to the collar 86 on the operating rod 82, no matter what the position of the carriage is lengthwise of the guide or track. The extreme front end of the bar 88 underlies the end of the short arm of a lever, 92, hung upon the side of the casing 3 of the marking mechanism and having its long arm terminating in the path of movement of one of the posts 43 forming part of the laundry marking mechanism. The parts are so proportioned that whenever the operator steps on the treadle for the purpose of marking a piece of laundry, the post 43, after having been released from the pawl of the inking device as heretofore explained, travels up and swings the lever 92 in a direction to cause this lever to depress the bar 88 and thus turn the driving shaft of the registering mechanism through a distance equal to one tooth.

The registering or counting and list or record printing mechanism is normally held raised above the table on which the lists are supported and, in order to print on one of the lists, it is necessary to depress this mechanism. As will be best seen from Fig.

6, the tubular support 75 for the registering and printing mechanism passes through an elongated vertical slot, 95, in the carriage 66 so as to permit the entire registering and printing mechanism to be lowered when the slide 72 is depressed. In order to prevent accidental depression of the slide 72 I provide it with a key, 96, having thereon a finger, 97, which is adapted normally to rest upon the top of the carriage 66 and lock the slide against being depressed. When it is desired to print upon a list, the key 96 is pressed, the first action being to carry the finger 97 from above the carriage and the slide being then free to travel downwardly against the tension of the supporting spring, 73.

The position of the registering and printing mechanism lengthwise of the list is controlled as follows: Arranged above the table 57 and parallel therewith and with the track 65 are two stationary frames, 100 and 101, spaced apart a distance equal to the distance between the rows on the laundry list. The frame 100 is located just inside of the path of movement of the carriage 66 along its track and its width is such that when the registering or counting and printing mechanism is adjusted so as to print in the left hand column of a list, the casing 74 of this mechanism lies in close proximity to the track. The under side of the frame 101 at the front end thereof, is cut away as indicated at 102 so as to leave room to permit the passage of the registering or counting and printing mechanism when it is run to the front or lower end of the table and then shifted laterally to bring it in proper relation to the right hand column on the list. The frames 100 and 101 are adapted to carry suitable keys and other devices for controlling the position of the registering and printing mechanism in the direction of the length of the list.

As perhaps best illustrated in Fig. 6 and in Figs. 11 to 13 inclusive, the tubular supporting member 75 for the registering and printing mechanism has a section cut away so as to form a vertical forwardly facing shoulder, 104. Carried by the frames 100 and 101 are vertically movable keys indicated at 105 and 106 respectively, any one of which may be depressed far enough to bring its stem, 107, in position to engage with the shoulder 104 and prevent the registering and printing mechanism from traveling forwardly. Each key of the set 105 corresponds to an article to be marked in the left hand row of a list and bears a proper identifying legend. The keys are so disposed that when a list is properly located on the table and the registering and printing device is arrested by engaging with the stem of one of the keys, downward pressure on the member 96, as heretofore explained, will

cause the mechanism to print in the column directly opposite the name corresponding to the key. Each of the position adjusting keys is provided with a spring, 108, which tends to hold it in its raised position. The stems of all of the keys of the set 105 project through openings, 109, in a sliding lock bar, 110. The openings 109 are larger in diameter than the stems of the keys and on each stem is a collar, 111, sufficiently small to pass down through the opening in the locking bar when the corresponding key is depressed. A spring, 112, constantly exerts its tension on the bar 110 in a direction to slide it transversely of the stems of the keys, thus keeping the stems all at one side of the openings through which they pass. The openings 109 or the collars 111, or both, are made tapered so that whenever one of the keys is pressed down, the locking bar 110 is forced back against the tension of the spring and allows the collar on the stem of the key to pass through to the under side of the bar. As soon as the collar passes below the bar, the latter is of course released and therefore the spring pushes it lengthwise and causes it to serve as a dog overlying the collar and preventing it from being raised.

The parts are so proportioned that whenever one of the keys is locked down its stem is in a position to engage with the shoulder, 104, on the counting and printing mechanism as indicated in dotted lines in Fig. 12 and also in full lines in Fig. 11 where one of the keys is shown in the position where the collar is just ready to pass below the locking bar but has not yet done so. It will be seen that when one key is locked down and another is depressed it carries the bar into its unlocking position and permits the key previously locked down to fly up into its normal position. The keys in the frame 101 are constructed and controlled in exactly the same way as those in the other set and it is believed that no detailed description of these keys is necessary.

The way in which the machine is used in order to control the position of the printing mechanism is as follows: When a new list is brought in place on the table, the supporting carriage is moved up along its track and the uppermost key, the "stop" key is depressed and serves to hold the combined registering and list-printing mechanism at the top of the first row. If the first name on the list is shirts, then this key is depressed and the mechanism is allowed to slide down under the influence of gravity and the spring 69 until it is arrested by the "shirt" key. As the shirts are marked by the marking mechanism, their total is registered and, when the last shirt has been marked, the printing key is depressed and a record is made on the list opposite the

word "Shirts," denoting the number of shirts which were marked. The position key corresponding to the next article or group of articles to be marked is then depressed, releasing the "shirt" key and also releasing the carriage so that it travels down until arrested by the key last depressed. In this way all of the articles which find places in the first column are marked and recorded and then the mechanism is shifted so as to make it possible to print in connection with the second column on the list, under the control of the group of keys 106.

The depression of the position determining key not only permits the registering and printing mechanism to be shifted so as to vary the printing point, but it also serves to return to zero or reset the registering or counting mechanism to be hereinafter described. The primary means for accomplishing this consists of a bar, 114, lying beside the stems of the keys 105 and a similar, through somewhat shorter bar, 115, lying beside the stems of the other set of position determining keys. Each of the bars is supported at its ends upon the free ends of pivotally supported arms, 116, of equal lengths; thus permitting the bars to be moved up and down without coming out of parallelism with the table or main track. On each of the keys is a peculiarly shaped dog, 117, pivotally arranged in a slot, 118, in the key. Each dog has a nose, 119, adapted to overlie the bar 114 or 115, as the case may be and also an arm or finger, 120, which is adapted to engage with a stationary cam bar or plate, 121, when the key is depressed; the result being that during the first portion of the downward movement of a key the bar 114, or 115, will be depressed but, before the extreme limit of the downward movement of the key is reached the cam 121 will swing the dog clear of the bar and leave the bar clear to rise without being interfered with by the key which remains locked in its depressed position by the locking bar 110.

The registering and record printing mechanism is best illustrated in Figs. 14 to 21. This mechanism is all inclosed in or carried by the casing 74 and consists of combined registering and printing wheels and suitable mechanism for supporting and controlling a typewriter ribbon. Within the casing 74 coaxial with the shaft 76, are supported three wheels, 130, 131 and 132, these being respectively units, tens and hundreds wheels; the unit wheel being fixed to the end of the shaft and the other two wheels having no direct connection with the shaft. The bottom of the casing or housing is open so that the extreme lower portions of the three wheels may project through the same. Each wheel is provided with ten printing heads, 133, equally spaced around

the periphery thereof and bearing the numerals from zero to 9 inclusive. In other words, the three wheels make it possible to register any number from 1 to 999 and also to print any of these numbers. That portion of the shaft 76 within the casing is surrounded by and supported in a stationary sleeve, 134, fixed to the casing. Each of the wheels has a recess, 135, of considerable diameter in one side thereof and, arranged within each of the recesses is a cup-shaped disk, 136, revolubly supported on the sleeve, 134, and which, with the corresponding wheel, forms a housing for a long coiled spring, 137. One end of each of the springs is connected to the stationary sleeve 134 while the other end is connected to the adjacent disk. On the periphery of each of the disks is a single tooth, 138, which is adapted to be engaged by a pawl, 139, arranged in a suitable recess, 140, in the surrounding wheel. The parts are so proportioned that when the shaft 76 is turned to advance the wheels, the movement of the wheels is in the direction to wind up the springs. When free to do so, therefore, the springs will always return the wheels to the initial positions which, in the present case, is that in which the zeros are at the bottom. On one side of each of the wheels are a series of ratchet teeth, 141, adapted to be engaged by suitable pawls for the purpose of normally holding the wheels against being turned backward by the action of the springs; there being of course as many of the ratchet teeth as there are printing positions on each of the wheels.

In order that the register may be reset, that is returned to zero, it is only necessary to release the wheels from their holding pawls, whereupon the springs will turn them back; but in case one or more of the wheels shall have made a single complete turn so as to be set at zero, it is a simpler matter to release the corresponding spring or springs and permit them to unwind without moving the wheel or wheels. This is accomplished by simply lifting up the pawls, 139, at the end of each complete revolution of the corresponding wheels, allowing the disks 136 to be turned backward while the wheels remain stationary. To this end I have provided each of the pawls, 139, with a lateral projection, 142, which projects through a slot, 143, so as to have its end lie within a groove, 144, on the side of the wheel opposite to that on which the pawl 139 is located and on the same side as the ratchet teeth 141. The holding pawls, 145, for the wheels are each provided with a lip, 146, projecting into the corresponding groove, 144, for the purpose of acting as a cam to engage with the nose, 142, on the corresponding pawl, 139, and lifting the pawl 139 far enough to release the spring held disk or drum and

permit the spring to unwind itself while the wheel is moving from 9 to zero. In other words, just before one of the wheels completes a whole revolution, the controlling spring which up to that time has been wound up, is released so that if the pawl 145 is moved away from the ratchet teeth 141, the spring being no longer under tension, the wheel stands still. If, on the other hand, the pawl 145 be lifted while the wheel is occupying any one of its remaining nine positions, the wheel will be immediately turned backward to the zero point. Each of the wheels is provided on its periphery with a single tooth, 147, in a position to be engaged by a suitable pawl, 148, when the wheel is in its zero position. These pawls prevent the wheels from being turned back past the zero point.

Extending through the casing, above the pawls 145, is a shaft, 149, having thereon three cam members, 150, each adapted, when the shaft 149 is turned in the proper direction, to engage with one of the pawls 145 and lift it away from the wheel which it is holding. A suitable spring, 151, normally holds the shaft 149 in a position in which the cam members 150 are raised above the pawls. One end of the shaft 149 projects through the wall of the casing on the side next to the tubular supporting member 75 and is there provided with a crank, 151, which underlies the bar 114 or the bar 115, heretofore described, depending upon whether the mechanism is to print in the first column or in the second column of the list; the parts being so proportioned that when one of the position determining keys 105 and 106 is depressed for the purpose of shifting the mechanism to a new printing point, the downwardly moving bar 114 or 115 engages with the crank 151 and rotates the shaft 149 in the proper direction to free the wheels from the pawls 145. Consequently the act of manipulating the mechanism to shift the printing point also resets the counting or registering mechanism so as to bring it to zero.

One of the features of my invention has to do with a novel construction and arrangement by means of which the tens wheel and the hundreds wheel are moved properly to register the tens and hundreds. It will be seen that I have provided the unit wheel, 130, with a pin, 155, extending transversely through the same near the periphery and held yieldingly in place by being attached to a spring, 156, secured to the unit wheel on the side farthest removed from the tens wheel. The ratchet teeth 141^a, corresponding to the teeth 141 on the unit disk are made long enough in the radial direction to permit them to be engaged by the pin 155 when the latter is pushed toward the tens wheel. The pin 155 may conveniently be actuated

by the holding pawl 145, the latter having a cam shaped end, 157, which engages with the pin and forces it laterally so that just as the unit wheel reaches the position for printing the numeral 9, the pin 155 is brought in contact with one of the ratchet teeth 141^a on the tens wheel; and therefore, when the unit wheel is turned into the next position, completing a single revolution, the tens wheel is carried forward one step. The pawl 145 is of course so shaped that as soon as the tens wheel has been carried through a complete step, the pin 155 is withdrawn by its spring and does not again come into play until another revolution of the unit wheel has been made. The hundreds wheel is just like the tens wheel and it is adapted to be actuated by means of a spring held pin, 160, on the tens wheel, this pin and the manner of supporting it being the same as the pin 155 and its spring 156. The parts are so proportioned that when the tens wheel has made nine-tenths of a revolution, the pin 160 lies in a position to be in axial alinement with the pin 155 at the time that pin is being pushed laterally for the purpose of actuating the tens wheel. Consequently, when the pin 155 is pushed in, it not only locks the unit wheel and the tens wheel together, but, by forcing the pin 160 laterally into engagement with one of the ratchet teeth on the hundreds wheel, it locks the hundreds wheel to the other two; the result being that as the units wheel completes its revolution, it carries both the tens and the hundreds wheel forward through one step. As soon as the pin 155 and the units wheel is released, the pin 160 is allowed to spring away from the hundreds wheel so that the three wheels are disconnected from each other.

I prefer to form the numerals on the registering and printing wheels in such a manner that it will print on the record sheet, that is the laundry list, through an inked ribbon in a manner corresponding to the ordinary typewriter. The ribbon is shown in dotted lines at 170 and has its ends secured respectively to drums, 171 and 172. From the drum 172 the ribbon passes under an idle roller, 175, underneath the casing, over an idle roller, 174, over the top of the casing, over an idle roller 173, and back to the drum 171. The drums 171 and 172 are loose upon a revoluble supporting sleeve, 176, suitably journaled in a rearward extension, 177, of the casing 74. Each drum is provided on its interior with ratchet teeth, 178, and, in a recess, 179, in the sleeve 176, is a double-ended rocking pawl, 180, which is adapted to engage alternately with the ratchet teeth of the two drums so as to lock either of the drums to the sleeve and leave the other free. Arranged above each of the drums is a pressure roller, 181, carried in a suitable rocking frame, 182; the frames being provided with

springs, 183, by means of which the rollers 181 are made to press against the drums or against those portions of the ribbon wound upon the drums. The frame overlying the drum 172 is provided with an arm, 184, which, when the drum 172 is practically empty, is pressed down upon that end of the dog 180 projecting beyond the drum 171 and holds the other end of the dog raised so as to lock the drum 172 to the sleeve. The swinging frame cooperating with the drum 171 carries a similar arm, 185, which lies beside the outer end of the drum 172 and is adapted to engage with the corresponding end of the dog 180 so as to swing it into the position to release the drum 172 from the sleeve and lock the drum 171 on the sleeve when the ribbon has been unwound from the drum 171. The sleeve 176 is provided with ratchet teeth, 186, on one end. Cooperating with the ratchet teeth 186 is a sliding pawl, 187, suitably supported by the casing and connected by means of a link, 188, to a vertically slidable member, 189, mounted on the side wall of the casing on the side of the casing next to the supporting member 75. A spring, 190, holds the member 189 normally raised and the pawl 187 normally retracted. The member 189 carries a pin, 191, which projects out through a slot, 192, in the side wall of the casing, in a position to underlie the bar 114 or 115 as the case may be. Whenever the bar is depressed, resetting the registering mechanism, as heretofore explained, it also presses down on the pin 191 and moves the ribbon actuating pawl in a direction to shift the ribbon a distance equal to one tooth on the ratchet wheel 186.

In view of the fact that the registering and printing wheels have no blank positions and will therefore always print something, if it be only a zero, if the ribbon is maintained between all of the wheels and the record sheet at all times, I think it advisable to provide means for shifting the ribbon so that it will be located only under those wheels from which it is desired to obtain an impression. In other words, when the printed record is to be a number less than 10, only the unit wheel comes into play and therefore at this time I intend that the ribbon shall be located only under the unit wheel and not under either of the others. For a number of two digits, the first two wheels of the group are used and therefore the ribbon should then be shifted so as to lie under these two wheels. Where a number of three digits is to be printed the ribbon should of course underlie all of the wheels. In order to control the position of the ribbon effectively I have passed it through a holder, 200, lying directly below the printing wheels and above the supporting table. The holder and ribbon are of course both wide enough to permit an impression to be made simul-

taneously by all three wheels. The holder is mounted on the front end of an arm, 201, which terminates at its rear end in a sleeve, 202, slidable upon a shaft, 203, extending transversely across the casing behind the registering and printing wheels. The shaft 203 is made long enough to permit the sleeve 202 to be shifted lengthwise thereof into the three positions necessary to give the holder its required three positions. A spring, 204, surrounding the shaft 203 and engaging with the sleeve 202 tends constantly to press the sleeve in the direction to bring the ribbon underneath all three of the wheels. The controlling means for the sleeve is as follows: Suitably supported in the casing 74 so as to be movable about an axis extending transversely of the shaft 202, and in a vertical plane containing the axis of this shaft, is a bell crank lever, 205, the lower end of which has a loose connection with the sleeve or it may simply engage with the sleeve at the proper end to enable it to push the sleeve against the tension of the spring when the lever is oscillated. The upper arm of the lever 205 underlies a laterally extending presser foot, 206, on the lower end of the member 189. The result is that whenever the member 189 is depressed, it oscillates the bell crank lever and moves the ribbon holder into the position necessary to print from the unit wheel alone, if the ribbon is not already in this position.

The sleeve 202 is provided with an upward projection, 207, which is adapted to be engaged by either of two pawls, 208 and 209, mounted on the rear wall of the casing 74, the pawl 208 locking the ribbon holder in the position for printing from the unit wheel alone and the pawl 209 locking the ribbon holder in the necessary position for permitting the unit and the tens wheel to print simultaneously.

The pawls 208 and 209 are controlled as follows: The pawl 208 has a finger, 210, which projects in proximity to the tens wheel and, when the tens wheel is in its zero position, lies in a depressed portion, 211, in the periphery of this wheel. When the tens wheel is moved out of the zero position, the finger 210 is forced outwardly and swings the pawl 208 from behind the projection 207, allowing the spring to shift the ribbon holder laterally until the projection 207 is brought to rest by coming in contact with the pawl 209. The pawl 209 is provided with a finger, 212, which cooperates with a depressed portion in the periphery of the hundreds wheel corresponding in every respect to the recess or depressed portion 211 in the tens wheel; so that when the hundreds wheel is shifted out of its zero position, it releases the pawl and allows the ribbon holder to be carried into its third position, namely that in which it holds the

ribbon beneath all three of the wheels. It will thus be seen that the position of the ribbon is determined entirely by the registering mechanism, the ribbon being held beneath the unit wheel only as long as the register does not count up a higher number than 9; being automatically shifted so as to extend also beneath the hundreds wheel when 100 is reached; and being always returned to the unit printing position whenever the mechanism is shifted to vary the printing point.

If desired, the table 57 may be provided with a pad or cushion, 215, sufficiently large to extend beneath all of the printing points in both columns of a laundry list properly disposed on the table.

While I have illustrated and described in detail only a single form of machine embodying my invention, the machine being designed to mark laundry articles, count them and make a printed record thereof on a list: my invention is not limited to the particular structural details so illustrated and described or to use in laundries or to a machine in which all of the described operations are combined; but I intend to cover all mechanisms or machines, irrespective of the particular use to which they are to be put, which come within the definitions of my invention constituting the appended claims.

I claim:

1. In combination, means for supporting a record sheet, article counting and record printing mechanism, means for actuating said mechanism to print on the sheet, means for marking an article and simultaneously setting said mechanism, and means for shifting said mechanism to vary the printing point and simultaneously resetting the counting mechanism.

2. In combination, article counting and record printing mechanism, means for marking an article and simultaneously setting said mechanism, and means for actuating said mechanism to cause it to print.

3. In combination, means for supporting a record sheet, article counting and printing mechanism adjacent to said support so as to be movable along a sheet on said support, means for marking an article and simultaneously setting said mechanism irrespective of the position which said mechanism is occupying with respect to the sheet, means for actuating said mechanism to print on the sheet, and means for shifting said mechanism to vary the printing point and simultaneously returning the counting mechanism to zero.

4. In combination, means for supporting a record sheet, article counting and record printing mechanism, means including a series of keys for shifting said mechanism to vary the printing point, and means for si-

multaneously marking an article and setting said mechanism.

5. In combination, means for supporting a record sheet, article counting and record printing mechanism, means including a series of keys for shifting said mechanism to vary the printing point, means for simultaneously marking an article and setting said mechanism, and an additional key for actuating said mechanism to cause it to print.

6. In combination, a support for a record sheet, article counting and record printing mechanism, means for marking an article and simultaneously adjusting said mechanism, and means including a series of keys for shifting said mechanism on said support to vary the printing point and simultaneously returning the counting mechanism to zero.

7. In combination, means for supporting a record sheet, article counting and record printing mechanism, means including a series of keys for shifting said mechanism step by step through a plurality of steps at a time to vary the printing point, and means for simultaneously marking an article and adjusting said mechanism.

8. In combination, means for supporting a record sheet, article counting and record printing mechanism, means including a series of keys for shifting said mechanism step by step or through a plurality of steps at a time to vary the printing point, means for simultaneously marking an article and adjusting said mechanism, and an additional key for actuating said mechanism to cause it to print.

9. In combination, a support for a record sheet, article counting and record printing mechanism, means for marking an article and simultaneously adjusting said mechanism, and means including a series of keys for shifting said mechanism on said support step by step or through a plurality of steps at a time to vary the printing point and simultaneously resetting said mechanism.

10. In combination, means for supporting a record sheet, registering and record printing mechanism adjacent to said support so as to be movable along the same to vary the printing point, means for setting said mechanism irrespective of the position which said mechanism is occupying with respect to the support, means for actuating said mechanism to print on a sheet on said support, and means including a series of keys for shifting said mechanism to vary the printing point.

11. In combination, means for supporting a record sheet, article counting and record printing mechanism supported adjacent to said sheet, means for acting on an article and simultaneously setting said mechanism, and means for producing relative move-

ments between said mechanism and said sheet in a direction to vary the printing point.

12. In combination, means for supporting a record sheet, article counting and record printing mechanism adjacent to said sheet, means for actuating said mechanism to print on the sheet, means for acting on an article and simultaneously setting said mechanism, and means for shifting said mechanism to vary the printing point.

13. In combination, means for supporting a record sheet, article counting and record printing mechanism in position to print on said sheet, means for acting on an article and simultaneously setting said mechanism, and means for producing a relative shifting movement between said mechanism and said sheet to vary the printing point and simultaneously re-setting said mechanism.

14. In combination, means for supporting a record sheet, article counting and record printing mechanism, means for shifting said mechanism to vary the printing point, and means for simultaneously marking an article and setting said mechanism.

15. In combination, means for supporting a record sheet, article counting and record printing mechanism in position to print on said sheet, means for producing a relative shifting movement between said sheet and said mechanism in a direction to vary the printing point, and means for simultaneously acting on an article and setting said mechanism.

16. In combination, means for supporting a record sheet, article counting and record printing mechanism, means including a series of keys for producing a relative shifting movement between said sheet and said mechanism to vary the printing point, means for simultaneously acting on an article and setting said mechanism, and an additional key for actuating said mechanism to cause it to print.

17. In combination, a support for a record sheet, article counting and record printing mechanism, means for acting on an article and simultaneously adjusting said mechanism, and means including a series of keys for producing a relative shifting movement between said mechanism and said sheet so as to vary the printing point and simultaneously returning the counting mechanism to zero.

18. In combination, means for supporting a record sheet, article counting and record printing mechanism, means including a series of keys for shifting said mechanism and said sheet relative to each other step by step to vary the printing point, and means for simultaneously acting on an article and adjusting said mechanism.

19. In combination, means for supporting a record sheet, article counting and record

printing mechanism, means including a series of keys for shifting said mechanism and said sheet relative to each other step by step or through a plurality of steps at a time, to vary the printing point, and means for simultaneously acting on an article and adjusting said mechanism.

20. In combination, a support for a record sheet, article counting and record printing mechanism, means for acting on an article and simultaneously adjusting said mechanism, and means for shifting said mechanism on said support step by step in order to vary the printing point.

21. In combination, a support for a record sheet, article counting and record printing mechanism, means for acting on an article and simultaneously adjusting said mechanism, and means for shifting said mechanism on said support step by step in order to vary the printing point and simultaneously re-setting said mechanism.

22. In combination, a support for a record sheet, article counting and record printing mechanism, means for acting on an article and simultaneously adjusting said mechanism on said support step by step or through a plurality of steps at a time in order to vary the printing point.

23. In combination, article counting and record printing mechanism, means for supporting a record sheet in proximity to said mechanism, means for actuating said mechanism to print on said sheet, and means for acting on an article and simultaneously setting said mechanism.

24. In combination, a supporting frame, means for holding a record sheet on said frame, article counting and record printing mechanism mounted on said frame in proximity to said sheet, and independent means for acting on an article and simultaneously setting said mechanism.

25. In a recording device, a wheel adapted to be moved step by step from a zero position, a spring connected to the wheel and adapted to be placed under tension as the wheel is moved forward, and re-setting mechanism constructed and arranged to release the wheel and permit the spring to return the wheel to zero provided the wheel has been moved forward a distance less than 360 degrees and to release the spring from the wheel and permit it to unwind if the wheel has been moved forward 360 degrees.

26. In combination, a supporting frame, means for holding a record sheet on said frame, article counting and record printing mechanism mounted on said frame in proximity to said sheet, independent means for acting on an article and simultaneously setting said mechanism, means for actuating said mechanism to print on a sheet, and means for shifting said mechanism and said

sheet relative to each other in order to vary the printing point.

27. In combination, means for supporting a record sheet, article counting and record printing mechanism, and means including a series of keys for shifting said mechanism on said support step by step or through a plurality of steps at a time to vary the printing point.
28. In combination, a support for a record sheet, article counting and record printing mechanism, means for setting said mechanism to adjust it, and means including a series of keys for shifting said mechanism on said support step by step or through a plurality of steps at a time to vary the printing point and simultaneously resetting said mechanism.

29. In combination, a support for a record sheet, a guide on said support, registering and record printing mechanism movable along said guide so as to vary the printing

point, means for setting said mechanism irrespective of the position which it occupies along said guide, and means for actuating said mechanism to print on a sheet on said support.

30. In a recording device, a wheel adapted to be moved step by step from the zero position, a spring connected to the wheel and adapted to be placed under tension as the wheel is moved forward so as to return the wheel to its zero position when free to do so, and means for automatically releasing the spring from the wheel and permitting it to unwind independently of the wheel when the latter makes a complete rotation from the zero position.

In testimony whereof, I sign this specification in the presence of two witnesses.

FRANK F. AKERLY.

Witnesses:

WM. F. FRENDEIREICH,
RUTH E. ZETTERVALL.