No. 753,012. PATENTED FEB. 23, 1904.

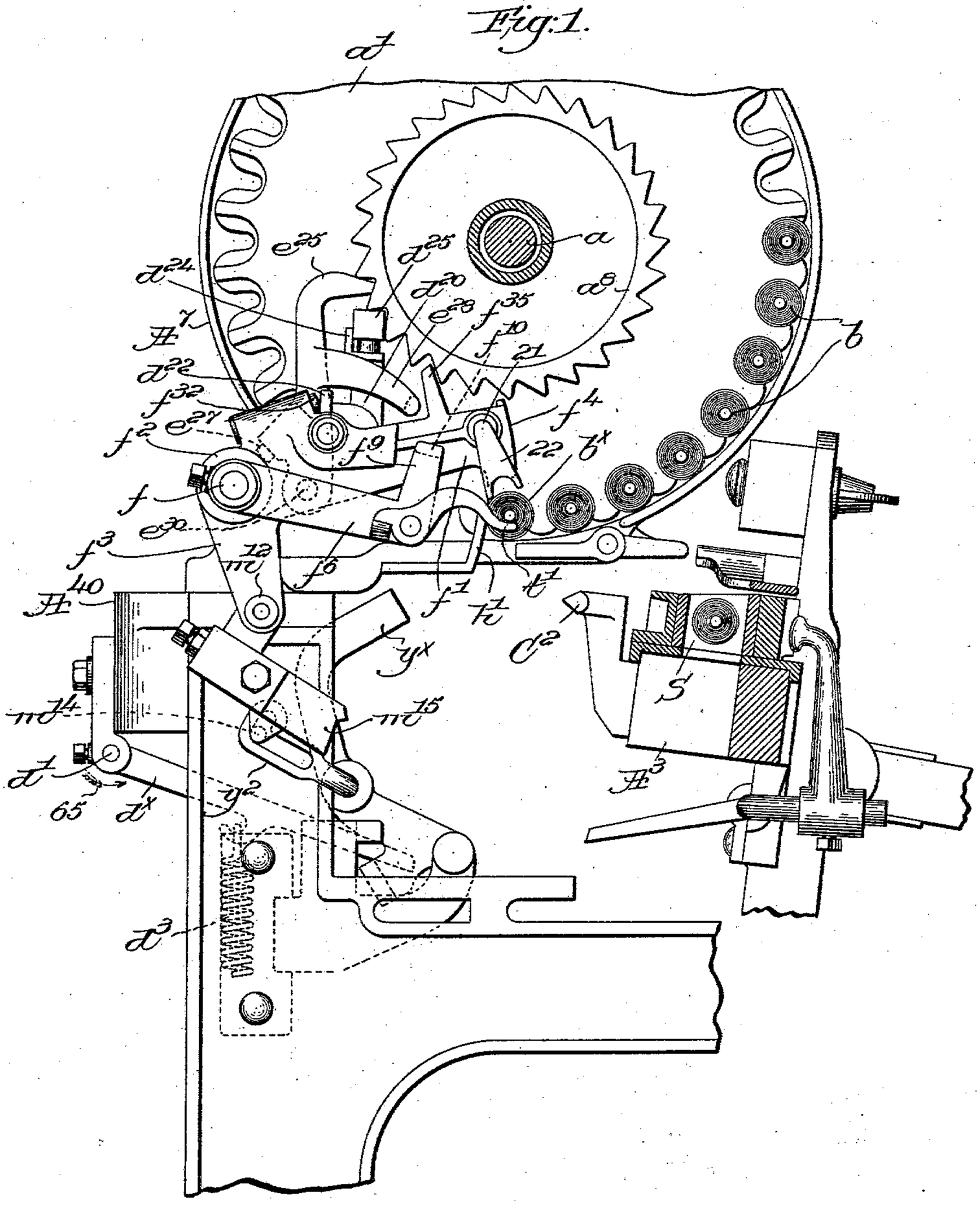
E. S. STIMPSON.

FILLING REPLENISHING LOOM.

APPLICATION FILED OCT. 15, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig: 2.

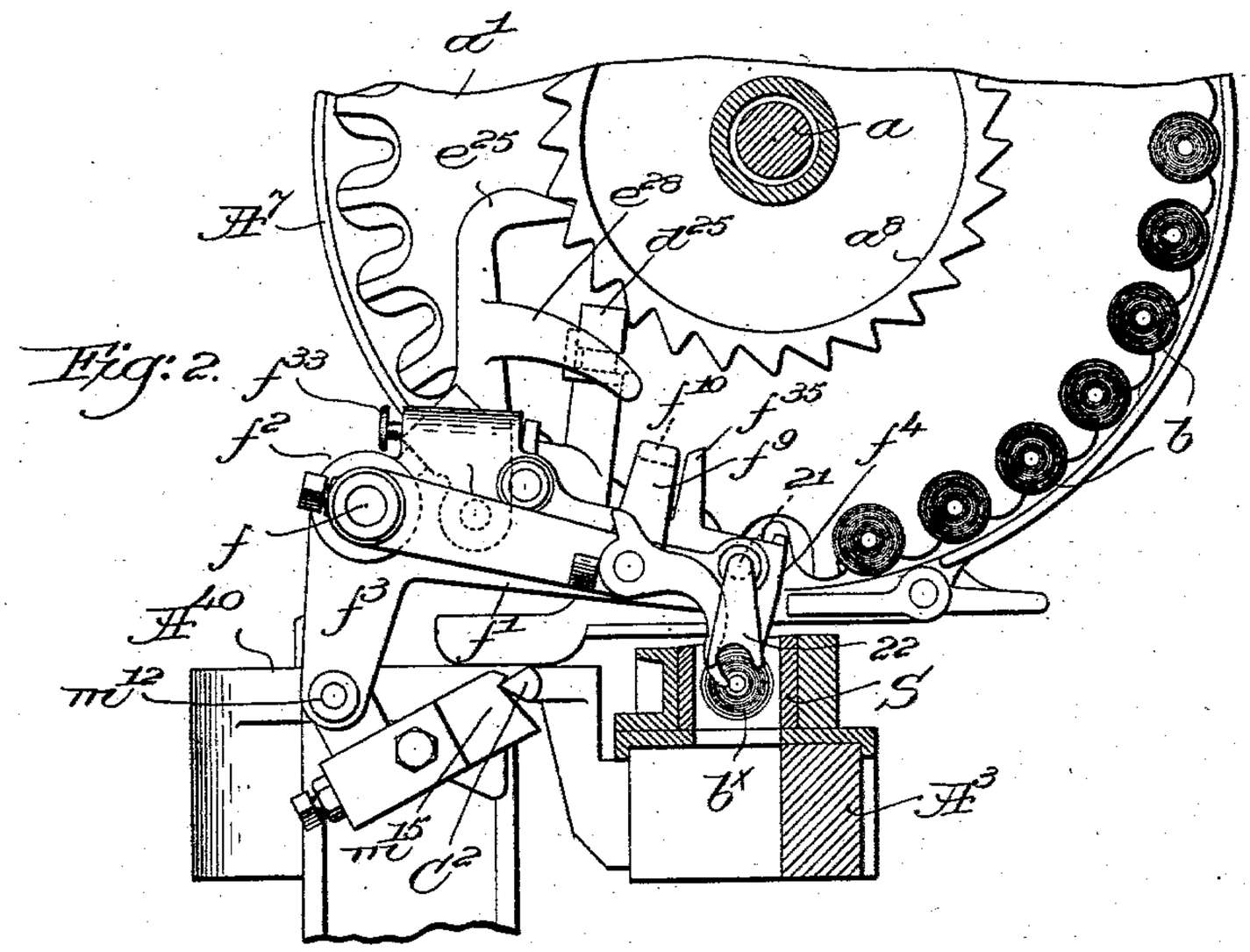


Fig: 4.

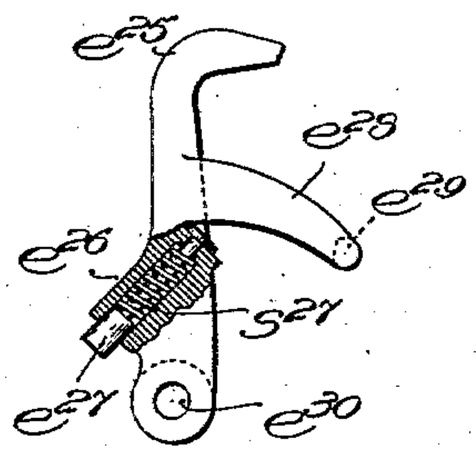


Fig: 3.

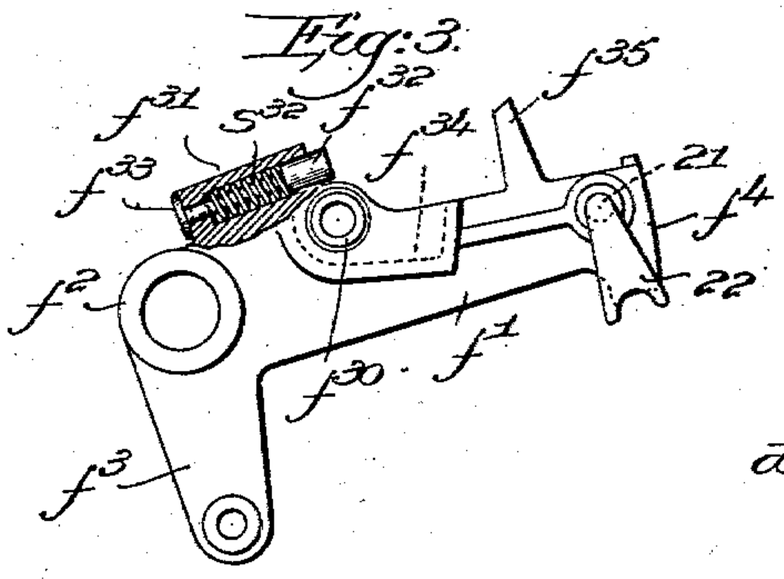


Fig: 5.

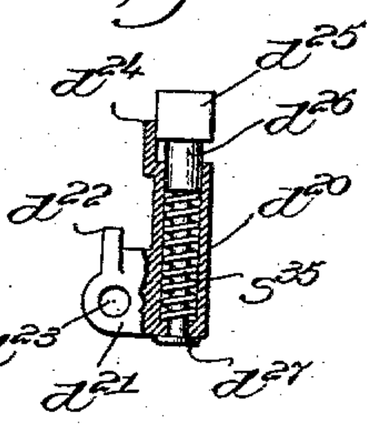
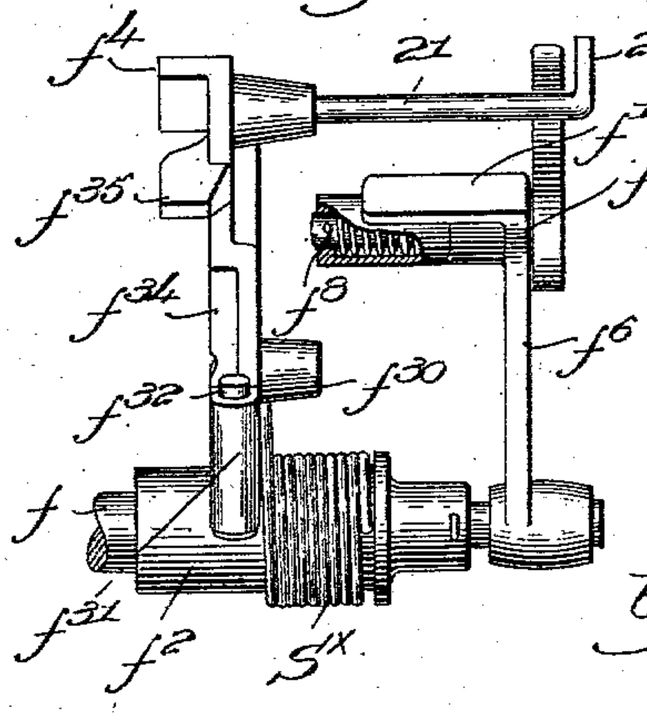


Fig: 6.



Witnesses,
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No. 753,012. Patented February 23, 1904.

UNITED STATES PATENT OFFICE.

EDWARD S. STIMPSON, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

FILLING-REPLENISHING LOOM.

SPECIFICATION forming part of Letters Patent No. 753,012, dated February 23, 1904.

Application filed October 15, 1903. Serial No. 177,133. (No model.)

To all whom it may concern:

Be it known that I, EDWARD S. STIMPSON, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Automatic Filling-Replenishing Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

In the type of automatic loom forming the subject-matter of United States Patent No. 529,940 a rotatably-movable feeder is provided to hold a plurality of circularly-arranged filling-carriers, such as bobbins, as a reserved supply, such filling-carriers being automatically transferred therefrom one by one to the running shuttle when the supply of filling therein has been entirely exhausted or exhausted to a predetermined extent or when the filling is broken, provision having been made for each of such contingencies. At first a strong spring was employed to effect the intermittent rotative movement of the feeder to bring the filling-carriers singly into position to be transferred; but in later constructions such spring was abandoned for practical reasons. Some of the patents illustrating the changes in and development of the means for operating and controlling the feeder are as follows: Nos. 651,715, 664,790, 680,169, and 710,023, the use of the strong spring being eliminated in all of them, and the various objections to such spring, together with certain desired features of construction to be attained, are set forth at some length in Nos. 664,790 and 710,023, to which reference may be had.

My present invention relates to the same general subject-matter, and more particularly to the means for effecting the intermittent rotative movement of the filling-feeder and for controlling the same, my invention having for its object the production of means to accurately and positively advance the feeder a predetermined distance after each transferring operation without shock or jar and to stop the feeder at the termination of each advance, locking it from any movement until the next transferring operation takes place.

The rotatable feeder having the filling-supplies in reserve circularly arranged therein and the rocking transferrer to engage the head and tip of one filling-supply after another and transfer the same from the feeder to the shuttle are all substantially as shown in the several patents referred to and operate as therein provided for. The stoppage of the feeder after each advance and the locking of the same from movement are herein effected independently of the filling-carriers, and if a filling-carrier is missing from its proper place the feeder brings the next one of the series to transferring position only by its regular advance movement, no overrunning of the feeder being permitted.

The various novel features of my invention will be fully described in the subjoined specification, and particularly pointed out in the following claims.

Figure 1 of the drawings is a transverse section of a sufficient portion of a loom to be understood with my present invention embodied therein and the parts being shown in normal position, the section being taken at right angles to the axis of rotation of and between the end plates or disks of the feeder. Fig. 2 is a similar view, but showing the transferrer as having just completed the transfer of a filling-carrier from the feeder to the shuttle, the lay being substantially at front center. Fig. 3 is a side elevation and partial section of the transferrer detached. Fig. 4 is a similar view of the detent for the feeder with a portion in section. Fig. 5 is principally a sectional detail of the device which starts and completes the advance of the feeder after each transferring operation; and Fig. 6 is a top or plan view, partly in section, of the transferrer and some of the parts movable therewith.

My present invention in some of its general characteristics approaches the construction shown in my prior patent, No. 664,790, hereinbefore referred to, in so far as the advanced movement of the feeder is effected by

or through a device mounted on the transferrer, operative movement of the latter serving to position said device and retraction or return movement of the transferrer causing said device to advance the feeder. To those skilled in the art it is well known that the retraction of the transferrer is rapid, and in my patent referred to it resulted in some shock or jar in overcoming the inertia and effecting the advance of the feeder. I have herein provided the device and the transferrer with a cushioned or yieldingly-sustained impact member which operates to yieldingly start the advance of the transferrer, thereby obviating shock or jar. I have also herein provided a spring control for such device, so that the operative positioning of the same is rendered more sure than where gravity alone is depended upon, as in Patent No. 664,790.

Referring to Figs. 1 and 2, the lay A^3, slotted below one of its shuttle-boxes and having a bunter C^2, the shuttle S, constructed and arranged to automatically thread itself when a fresh filling-carrier is transferred thereto, the stand A^7, mounted upon the breast-beam A^{40} and having secured to it a fixed stud *a*, on which the filling-feeder is rotatably mounted, and the feeder itself, comprising two parallel disks, only one of which, as *a'*, is herein shown, to receive between them the filling-supplies or filling-carriers *b*, the two disks of the feeder being connected and mounted to rotate in unison on the stud *a* are all of well-known or usual construction, the feeder being provided with a toothed disk or ratchet wheel a^8, rotatable with the feeder and having teeth corresponding in number to the holding devices for the filling-carriers, the latter being circularly arranged relatively to the axis of the feeder.

The arm or transferrer f', having its hub f^2 mounted to rock on a stud *f*, rigidly secured to the stand A^7, is herein shown substantially as in my Patent No. 664,790, the transferrer having a downturned portion f^4 to engage the head of the filling-carrier, while the tip of the latter is engaged by the notched downturned end 22 of the arm 21, secured to and extended laterally from the transferrer f'. The transferrer is retracted and returned to normal position by the usual spring $S^\times$, Fig. 6.

The rock-shaft d', its arm $d^\times$, depressed by spring d^3, the shuttle-feeler $y^\times$, controlled as to its movement by the arm $d^\times$, the branch y^2, rigid with the feeler and controlling the notched dog m^{15}, mounted on the rocker-stud m^{12}, carried by downturned end f^3 of the transferrer, and the lug m^{14} on the dog and coöperating with the branch y^2 are of usual construction, a spring (not herein shown) tending to turn the rocker-stud m^{12} and lift the dog m^{15} into the path of the bunter C^2 to effect the operation of the transferrer when the rock-shaft d' is turned by well-known means in the direction of the arrow 65.

The transferrer (shown separately in Fig. 3) is provided with a lateral boss f^{30} and on its top with an elongated tubular housing f^{31}, in which is mounted a plunger f^{32}, normally projected toward the free end of the transferrer by a spring s^{32} and outward movement of the plunger being limited by a head f^{33}, secured to its stem. The transferrer is shaped to present a pocket or recess f^3 on the side opposite to the boss f^{30} and nearer the free end of the transferrer.

The transferrer has mounted upon it and movable relatively thereto the device for effecting the advance of the feeder, such device being best shown in Fig. 5, it comprising a tubular dog d^{20}, provided at its lower end with an ear d^{21}, provided with an upturned lug d^{22} and a stud d^{23} at right angles to the ear. The upper end of the dog has at one side a flat elongated extension d^{24}, which bears against the flat-sided head d^{25} of an impact member (shown as a plunger) d^{26}. The shank of the plunger extends through a hole in the lower end of the dog and has suitably secured to it a stop d^{27}, while the spring s^{35} surrounds the shank within the tubular dog, said shank tending to maintain the impact member in the position shown in Figs. 1 and 5. The dog is mounted on the transferrer, the ear d^{21} and lower portion of the dog entering the recess f^{34}, while the stud d^{23} extends through and rocks in the boss f^{30}, being retained in place by contact with the adjacent face of the detent d^{25}. The upturned portion d^{22} of the ear is thus brought into coöperation with the end of the plunger f^{32}, carried by the transferrer, so that the dog and impact member carried thereby are pressed toward the free end of the transferrer. The head d^{25} of the impact member under normal conditions is maintained in engagement with the toothed disk or ratchet wheel a^8, as shown in Fig. 1, by the joint action of the springs s^{32} and s^{35}. The former spring presses the impact member toward the center of the feeder, while the latter spring keeps the impact member against the lower edge of the tooth next above it.

The stand A^7 is provided with the usual guide *h'* for the front side of the filling-carrier to be transferred, (indicated at $f^\times$, Figs. 1 and 2,) and when transfer takes place the downward movement of the transferrer acts to transfer a filling-carrier from its position in the feeder shown in Fig. 1 into the shuttle, as shown in Fig. 2, and during such operative movement of the transferrer the dog d^{20} and its impact member move down into the position shown in Fig. 2, the head d^{25} clicking over the last tooth engaged and being forced by the spring s^{32} against the outer face of the next tooth ahead. Referring to Fig. 2, it will be seen that the operative movement of the trans-

ferrer serves to compress the spring s^{32} at such time, insuring the operative positioning of the dog and impact member for the starting and advancement of the feeder. Now upon retraction or return of the transferrer to normal position the dog is lifted bodily and the top of the head d^{25} engages the nearly radial edge of the tooth next above it and the first action is a compression of the spring s^{35}, the impact member thus cushioning and softening the blow of the head upon the ratchet-tooth, and as the spring is compressed the inertia of the feeder is overcome and its advance is begun. The advance movement is complete when the parts reach their normal position, (shown in Fig. 1,) and at that time the feeder has been moved forward an angular distance of predetermined amplitude.

The transferrer is provided with a rigid upturned stop f^{35}, which is brought into position in front of a tooth of the ratchet-wheel, as shown in Fig. 1, when the transferrer is retracted to prevent any additional movement of the feeder. The feeder advance therefore is stopped independently of the filling-carriers in the feeder. The filling-carriers therefore perform no function in limiting the advance movement of the feeder. Inasmuch as the feeder is advanced a fixed amount at each operation of the transferrer it will be manifest that should a filling-carrier have been omitted in the series through carelessness or otherwise the feeder will not overrun to bring the next filling-carrier into position; but another operation of the transferrer must take place before the next properly-placed filling-carrier can be moved into transferring position. Retrograde rotation of the feeder is prevented by a detent-pawl e^{25}, (shown separately in Fig. 4,) pivotally mounted on a stud e^{30} on the stand A^7, said pawl having a housing e^{26} to receive a plunger e^{27}, controlled by a spring s^{27}, the plunger being so located that its projecting end rests against the hub f^2 of the transferrer. The spring s^{27} thus acts to yieldingly maintain the detent-pawl in engagement with the ratchet-wheel at all times, so that when the operation of the transferrer takes place and the dog is moved to take a fresh hold on the ratchet-wheel the latter cannot move backward. Forward movement of the feeder cannot take place during transfer, as the filling-carrier being transferred is moved across the face of the guide h' and in addition the upright edge of the head of the impact member and also the detent-pawl e^{25} coöperate with the ratchet-wheel to prevent any advance.

It is sometimes necessary for the operator to move the feeder backward, and to do this of course the detent-pawl e^{25} and the impact member of the top d^{20} must be disengaged from the ratchet-wheel. To facilitate such disengagement, the detent-pawl is provided with a retracting device consisting of a rearwardly-extended arm e^{28}, having a lateral extension e^{29}, which extends across and behind the dog, as shown in Fig. 1. If the operative wishes to disengage the ratchet-wheel, he pulls toward him the detent-pawl e^{25}, and thereby the lug e^{29} is brought against the dog and swings the latter forward out of engagement with the ratchet-wheel.

The tip-support t' to support the tip of the filling-carrier as it is transferred to the shuttle is substantially such as shown in my Patent No. 720,189, said tip-support being pivotally mounted on a fixed arm f^6, secured to the stud f and rocking on the spring-controlled stud f^8 as a fulcrum, as provided in said patent.

It has been found in practice that sometimes the hands of an operative are injured by manual depression of the transferrer too far, it being at times necessary so to depress the transferrer, and to prevent such injury I have herein provided a guard, shown as an upturned portion f^9 on the fixed arm f^6, provided with a lateral extension f^{10}. (See particularly Fig. 6 extending toward the transferrer.) The most usual way to manually depress the transferrer is for the operative to press down on the arm 21, and when he does so his hand comes in contact with the extension f^{10} when the transferrer is depressed as far as it may safely be accomplished. At such time the stop f^{35} is carried below the teeth of the ratchet-wheel a^8.

My invention is not restricted to the precise construction and arrangement herein shown and described, as the same may be modified or rearranged in various particulars by those skilled in the art without departing from the spirit and scope of my invention.

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

1. A rotatable filling-feeder to hold a circularly-arranged series of filling-carriers, a transferrer, and means, including a device movable with and also relatively to the transferrer and having a cushioned impact member, to move the feeder positively and intermittingly without shock and place the filling-carriers one by one in position to be transferred.

2. A rotatable filling-feeder to hold a circularly-arranged series of filling-carriers, a transferrer, a device movably mounted thereon having a cushioned impact member, and a toothed disk movable with the feeder, return of the transferrer to normal position first causing the impact member to engage said disk, and yieldingly overcome the inertia of the feeder and thereafter to positively advance the same a predetermined distance, whereby another filling-carrier is moved into position to be transferred.

3. A rotatable filling-feeder to hold a series

of circularly-arranged and equidistant filling-carriers, a transferrer, and means mounted thereon to yieldingly start, and positively complete and stop, an angular movement of the feeder of fixed amplitude by or through each operation of the transferrer.

4. A rotatable filling-feeder to hold a series of circularly-arranged and equidistant filling-carriers, a transferrer, a spring-controlled device pivotally mounted thereon provided with a cushioned impact member, to yieldingly start and thereafter complete a predetermined angular advance of the feeder on the return of the transferrer to normal position, and a detent to prevent retrograde movement of the feeder.

5. A rotatable filling-feeder to hold a series of circularly-arranged filling-carriers, a transferrer, a spring-controlled device pivotally mounted thereon and having a yieldingly-supported impact member, a toothed disk rotatable with the feeder, and a detent to prevent retrograde movement of the latter, operative movement of the transferrer positioning said device and return movement of the transferrer causing the impact member to engage the disk and yieldingly start and complete a predetermined advance of the feeder.

6. A rotatable filling-feeder to hold a series of circularly-arranged filling-carriers, a ratchet-wheel rotatable therewith, a transferrer, a dog thereon having a yieldingly-supported tip to coöperate with the ratchet-wheel, a detent to prevent retrograde movement of the feeder, operation of the transferrer advancing the dog upon the ratchet-wheel and its return to normal position acting through said dog to yieldingly start and move the feeder forward a predetermined distance, and stopping means for the feeder acting independently of the filling-carriers therein.

7. A step-by-step rotatable feeder adapted to hold a plurality of filling-supplies, a transferrer to remove them one by one, and cushioned means mounted on and controlled by movement of the transferrer to overcome the inertia of the feeder without shock and effect a predetermined angular movement of the feeder after operative movement of the transferrer.

8. A step-by-step rotatable feeder adapted to hold a plurality of filling-supplies, a transferrer to remove them one by one, a spring-controlled detent to prevent retrograde movement of the feeder, and cushioned means mounted on and controlled by movement of the transferrer to overcome the inertia of the feeder without shock and effect a predetermined angular movement of the feeder after operative movement of the transferrer.

9. A step-by-step rotatable feeder adapted to hold a plurality of filling-supplies, a ratchet-wheel rotatable therewith, a transferrer to remove the filling-supplies one by one, a dog pivotally mounted on the transferrer, and a spring-controlled plunger-tip carried by the dog to coöperate with the ratchet-wheel, operation of the transferrer advancing the tip along the ratchet-wheel and return movement of said transferrer causing said tip to yieldingly start and then advance said ratchet-wheel and feeder to place another filling-supply in position to be transferred.

10. A step-by-step rotatable feeder adapted to hold a plurality of filling-supplies, a ratchet-wheel rotatable therewith, a transferrer to remove the filling-supplies one by one, a dog pivotally mounted on the transferrer, and provided with a yieldingly-sustained tip, a spring carried by the transferrer to act upon the dog and rock it into active position upon operative movement of the transferrer, return of the latter to normal position causing the tip to engage and yieldingly start the ratchet-wheel and then complete its advance, and means to stop the advance of the feeder independently of the filling-supplies therein.

11. A rotatable filling-feeder adapted to hold a circularly-arranged series of filling-carriers, a ratchet-wheel rotatable with said feeder, a transferrer, means mounted thereon to yieldingly engage the ratchet-wheel and effect a predetermined angular advance of the feeder after each operation of the transferrer, a detent to prevent retrograde movement of the latter, and means to disengage said means from the ratchet-wheel by or through movement of the detent to inoperative position.

12. A rotatable filling-feeder adapted to hold a circularly-arranged series of filling-carriers, a transferrer, means mounted thereon and including a cushioned impact member, to yieldingly engage and effect a predetermined angular advance of the feeder after each operation of the transferrer, and a device acting through said means to stop the advance of the feeder independently of the filling-carriers therein.

13. A rotatable filling-feeder adapted to hold a circularly-arranged series of filling-carriers, a transferrer, means mounted thereon and including a cushioned impact member, to yieldingly engage and effect a predetermined angular advance of the feeder after each operation of the transferrer, a detent for the feeder, mounted independently of the transferrer, and a device carried by the detent to render said feeder-advancing means inoperative by or through manual retraction of the detent.

14. A rotatable filling-feeder adapted to hold a circularly-arranged series of filling-carriers, a transferrer, means governed by or through movement thereof to effect a predetermined angular advance of the feeder after each operation of the transferrer, and a fixed guard to limit manual movement of the transferrer.

15. A rotatable filling-feeder adapted to hold a circularly-arranged series of filling-carriers, a ratchet-wheel rotatable with said feeder, a transferrer, a dog fulcrumed thereon, a spring-controlled impact member mounted on said dog to yieldingly coöperate with the ratchet-wheel and effect angular advance of the feeder upon retraction of the transferrer, a positioning-spring for the dog, mounted on the transferrer and acting to position the dog and its impact member relatively to the ratchet-wheel upon operative movement of the transferrer, and a detent to at such time prevent retrograde movement of the feeder.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD S. STIMPSON.

Witnesses:

GEORGE OTIS DRAPER,

ERNEST W. WOOD.