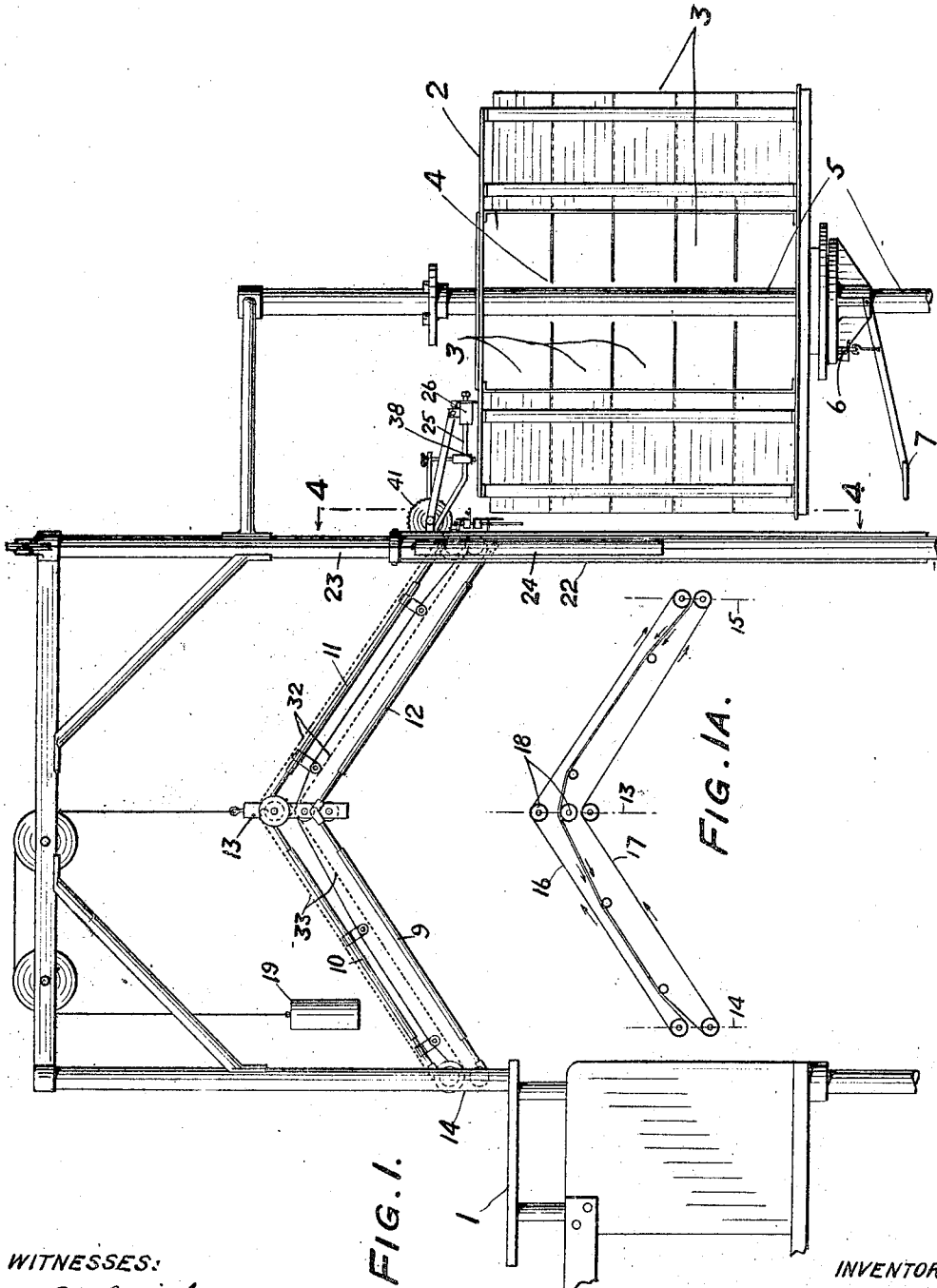


W. P. SARGENT.
BOOK FEEDER.
APPLICATION FILED JULY 20, 1911.

1,033,951.

Patented July 30, 1912.

4 SHEETS-SHEET 1.



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4 SHEETS—SHEET 2.

FIG. 2.

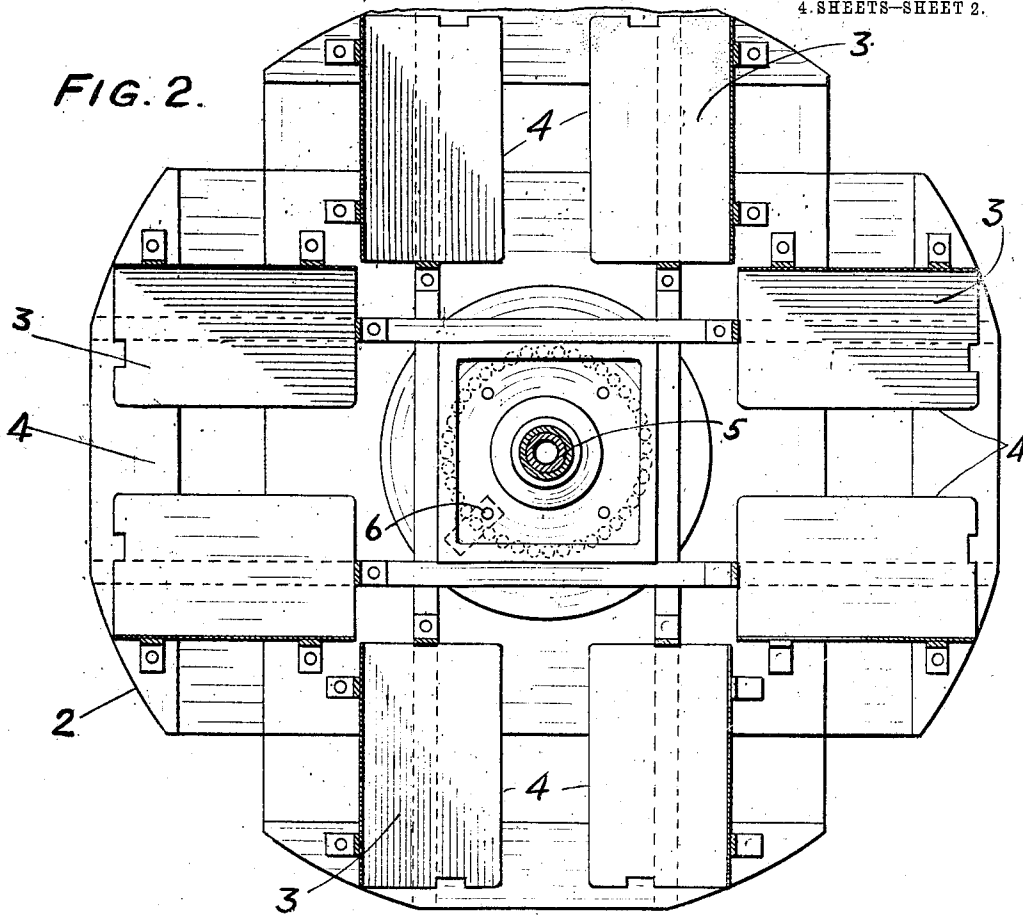
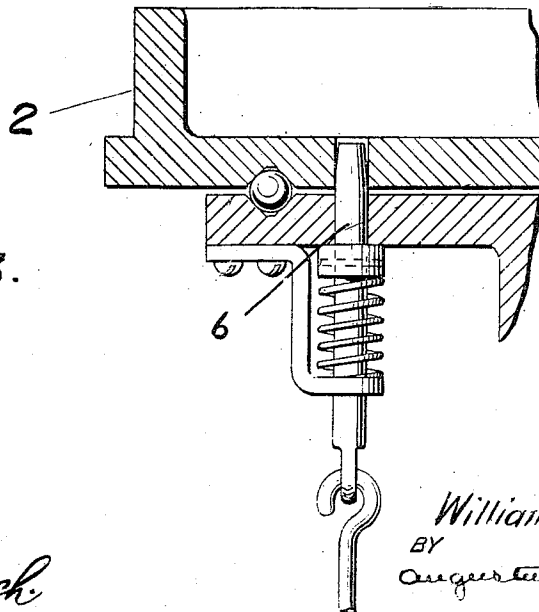


FIG. 3.



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4 SHEETS—SHEET 3.

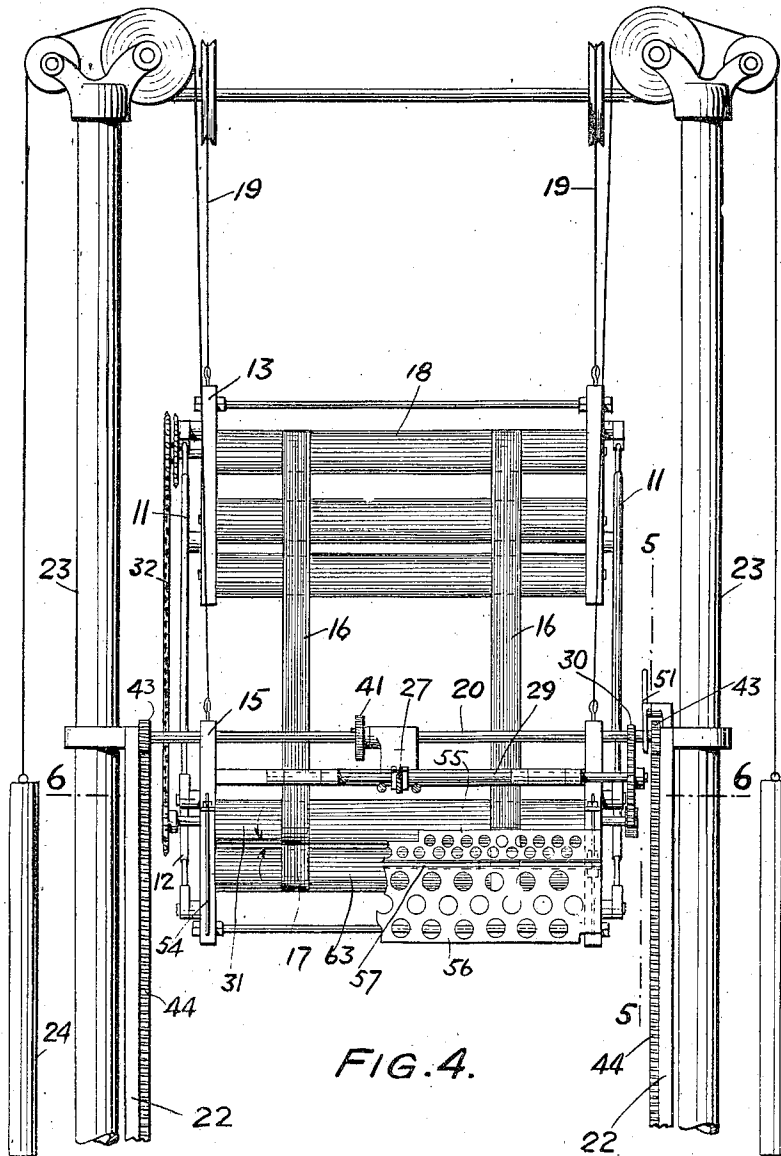


FIG. 4.

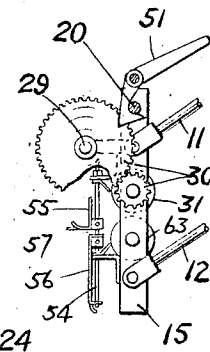


FIG. 5.

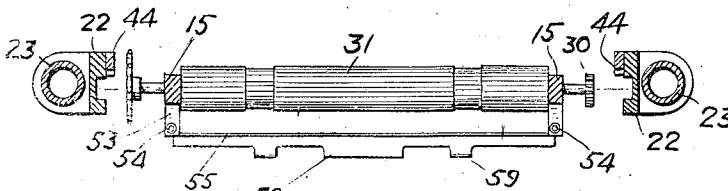


FIG. 6.

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4 SHEETS-SHEET 4.

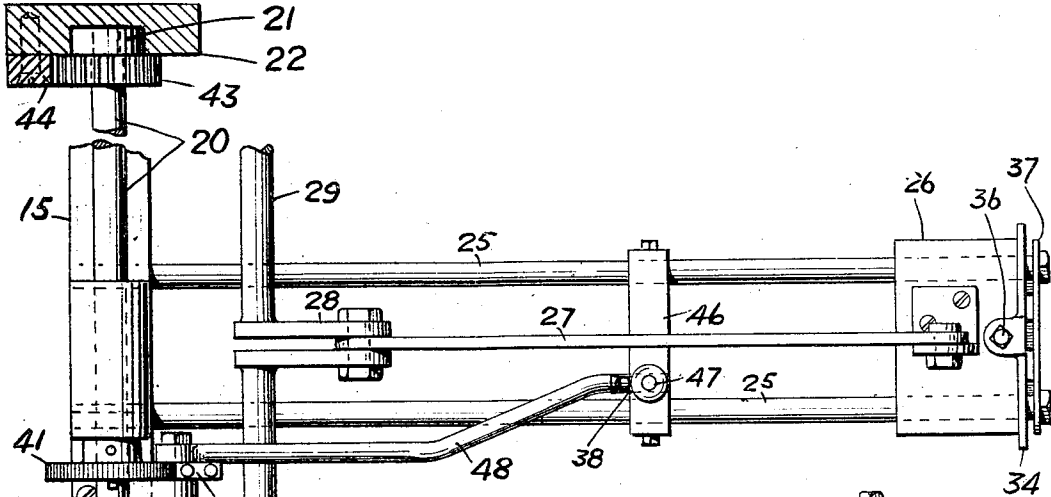


FIG. 8.

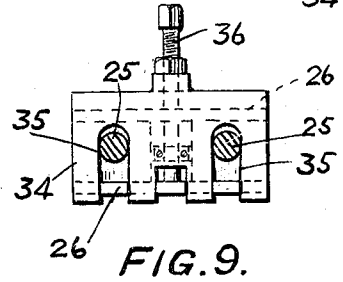


FIG. 9.

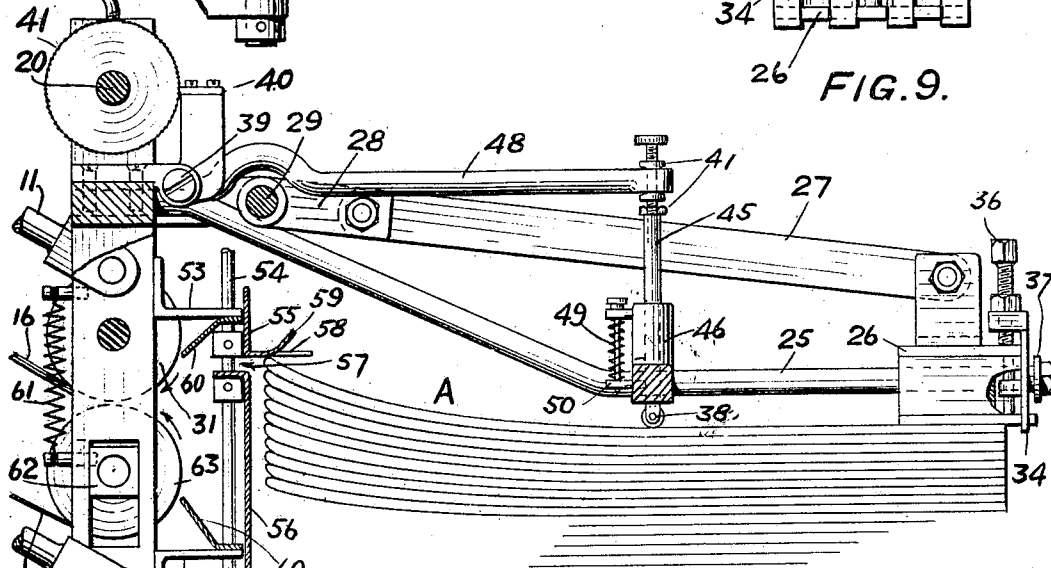


FIG. 7.

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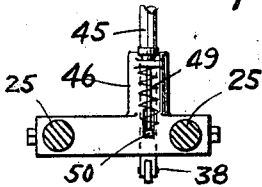


FIG. 10.

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UNITED STATES PATENT OFFICE.

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BOOK-FEEDER.

1,033,951.

Specification of Letters Patent.

Patented July 30, 1912.

Application filed July 20, 1911. Serial No. 639,572.

To all whom it may concern:

Be it known that I, WILLIAM P. SARGENT, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Book-Feeders, of which the following is a specification.

Objects of the present invention are to provide automatic mechanism for feeding one or any required number of books or magazines at a time, even though the thickness of the books may vary from time to time; to provide automatic mechanism for drawing or raking one or any required number of books or magazines at a time from the top of a pile or stack and for continuing to do this as the height of the pile or stack decreases; to provide for arranging or stacking the books or magazines so as to maintain the supply thereof for the automatic mechanism; to provide a book or magazine feeding mechanism adapted to feed one or any definite number of books at a time for any operation, for example, to some machine, but which is well adapted for use in connection with the parts of the complete wrapping machine invented by me and described in my Patent No. 1,024,028, of April 23rd, 1912; to provide for rapidly and accurately feeding books, one at a time, or in groups from the top of a stationary pile; to provide for automatically positioning the book feeding mechanism in such manner that it is accommodated to the curvature of the top surface of a pile of books; to insure parallelism of motion of the feeding mechanism as it operates upon the diminishing pile of books; to provide self-adjusting means for controlling the passage of the books; to accomplish the feeding of books of different thicknesses; to overcome the difficulty in feeding books from the top of a pile, which arises from the fact that when piled one edge of the pile is much higher than the other, and to provide for feeding the books with their bound edges in advance of their free edges.

The invention will be claimed at the end hereof, but will be first described in connection with the embodiment, but not the only embodiment of it, chosen for illustration in the accompanying drawings, in which—

Figure 1, is a side view of a book or maga-

zine feeder embodying features of the invention. Fig. 1^a is a diagrammatic view illustrating the arrangement of belts shown in Fig. 1. Fig. 2, is a top or plan view, partly in section, of the book or magazine revolving turret. Fig. 3, is a sectional view, drawn to an enlarged scale, and illustrating a detail of construction of the turret. Fig. 4, is a view looking in the direction indicated by the arrows 4—4' of Fig. 1. Fig. 5, is a view on the line 5—5 of Fig. 4, looking toward the left. Fig. 6, is a sectional view, taken on the line 6—6 of Fig. 4. Fig. 7, is a side view, partly in section, showing the book feed and detector. Fig. 8, is a top or plan view of the same. Fig. 9, is an end view of the feeders, and Fig. 10, is an end view of the detector.

There is some means for receiving the books and such means is indicated at 1, but the receiving means is usually a wrapper mechanism such as is described in my Patent No. 1,006,009 of October 17th, 1911.

2, is a book holder. Its form may vary and its principal requirement is that it shall support a pile of books or magazines in such a way that access can be had to the upper surface of the pile and to the edge of one or more books or magazines. As shown the book holder consists of a revoluble turret having compartments 3, separated by partitions slotted at 4, so that each compartment is open at its top and the compartments are arranged, one above the other in rows of which there are four at the respective sides of the turret. The turret is revoluble around the standard 5 and there is a spring bolt 6 for locking it with any one of these rows of compartments in operative position so that the other compartments are exposed for refilling.

7, is a pedal by means of which the bolt can be released.

The object in subdividing the book space into comparatively small units, as the compartments 3, is to present fairly small piles of books or magazines at a time. Some books or magazines are so bound at one edge that when piled, the pile is much higher at that edge than at the other, as can be seen by reference to Fig. 7, in which the bound edges are at the left-hand side. Therefore by reducing the height of the piles, the curvature at the top, while considerable, is comparatively reduced.

There is parallel motion mechanism having a fixed end and a movable end, the fixed end being shown at the left in Fig. 1. The parallel motion mechanism comprises links 9 and 10, and 11 and 12, one end of each of which is pivoted to the counter-balanced frame 13, and the other ends of the links 9 and 10, are pivoted to the fixed support 14, while the other ends of the links 11 and 12, are pivoted to a carriage 15, which will be presently described. The pivots for the links are disposed in proper relation for insuring parallelism of the links. Applied to the parallel motion are two belts 16 and 17, arranged to run over guide rolls 18 in the direction shown by the arrows in Fig. 1^a, so that between the adjacent sides of the belts the books or magazines are carried.

19, is a counter-weight and its connections 20 for balancing the weight of the parallel motion mechanism.

The carriage 15 applied to the movable end of the parallel motion, as has been described, has a tendency to descend and it is guided by a shaft 20 having rollers 21 that run in grooves or ways 22 applied to the standards 23.

24, are counter-weights applied to the carriage for supporting a part of its weight, but not sufficient to overcome its tendency to descend by gravity. Projecting laterally from the carriage are rods 25 upon which the feeder head 26 may slide. The feeder head 26 is reciprocated on these rods 25 by means of a link 27 and crank 28, formed on a shaft 29, journaled in the carriage and driven by gear wheels 30, from one of the feed rolls 31, which is driven by a sprocket chain 32 and by a sprocket-chain 33, the sprocket wheels for these chains being carried by the parallel motion and power being applied from the left-hand end of the parallel motion, as shown in Fig. 1 by means which are not illustrated. The feeder 34 is movable up and down in respect to the feeder head 26, and it is shown as notched at 35 for the accommodation of the rods 25 which are tied together at their ends by the plate 37. The feeder 34 drops behind the pile of books or magazines into position for raking or drawing one or any required number of them at a time from the top of the pile. The set screw 36 affords means for limiting the extent to which the feeder 34 may depend from the feeder head 26. The rear end of the feeder head is provided with fingers, Fig. 9, which extend into the notches between fingers on the lower edge of the feeder and these fingers insure proper delivery of the books or magazines.

38, is a detector pivoted to the carriage at 39 and provided with a detent 40. The detent 40 is adapted to engage and dis-engage the teeth of a ratchet wheel 41 keyed to the shaft 20, fitted with toothed wheels 43 that

mesh with racks 44 carried by the standards 23. The detector is shown to comprise a rod 45 working through a guide 46 carried by the rods 25 and having at one end a roller to rest on the top of the pile of books A and having at its other end adjustable connection by means of the adjusting screw and jam nuts 47 with the arm 48. There is a spring 49 interposed between a bracket on the guide 46 and a lug 50 projecting from the rod 45 through a slot in the guide as shown in Fig. 10. The purpose of this spring is to project the rod 45 through the guide and to thus tend to turn the detent 40 out of engagement with its ratchet wheel 41. Evidently the racks 44, pinions 43, ratchet wheel 41, detent 40, and detector 38, constitute a stop motion for arresting the descent of the carriage 15.

51, is a catch that may be employed for holding the carriage in elevated position, when desired, for example, when the machine is at rest or when the turret is being turned.

The carriage is fitted with what may be called a floating frame. There are brackets 52 and 53 and there are rods 54 which may work up and down through suitable openings in these brackets. These rods have adjustably screwed to them gates 55 and 56 having between them an opening 57 for the passage of the required number of magazines or books.

58, is a finger resting on the top magazine or book of the pile and it serves to position the floating frame, or more accurately, the opening 57 between the gates.

By reference to Figs. 6 and 7, it will be observed that the top gate has fingers 59 which are turned upward to guide books into the opening 57. 60 are deflectors projecting from the brackets 52 and 53. 61 are springs which tend to exert pressure on the movable blocks 62 in which the feed roll 63 is journaled so as to draw the feed rolls 63 and 31, carried by the carriage 15 into contact, or more accurately, to draw the belts which pass around them into contact. It will, of course, be understood that the belts are to be driven by the application of power, for example, at the left-hand end of the parallel motion mechanism in Fig. 1, or in any other convenient way.

In use the compartments of the turret are filled with piles of magazines or books and one row of compartments is presented to the reciprocating feeder and detector. The carriage 15 is then freed, for example, by releasing the catch 51 and the carriage and all the parts carried thereby descend until the detector 38 rests upon the top magazine or book of the pile A, which it does, not necessarily at the high part of the pile, but at any intermediate part of the top surface. The detector resting on the top magazine

brings the detent 40 into engagement with the ratchet wheel 41 and arrests the carriage. Simultaneously with this, the finger 58 rests upon the top edge of the pile of books or magazines and thus positions the opening 57 between the gates for the passage of the required number of books or magazines from the top of the pile. The reciprocating feeder 34 then moves toward the left, in Fig. 7, operates on the edge or edges of the top book or books and rakes or pulls the same forward under the detector through the space 57, between the guide rolls 63 and 31 into position between the adjacent sides of the belts 16 and 17, which carry it, or them, forward along the parallel motion mechanism and deliver it or them at the left hand end, as shown in Fig. 1. Upon the withdrawal from the top of the pile of magazines or books, the detector drops to the next book or magazine of the pile and in doing so releases the detent 40 from the ratchet wheel 41 and allows the carriage to descend slightly until it is in proper position for the next book feeding operation. Meanwhile the finger 58 rests upon the book below and again properly positions the opening 57. By a repetition of the described operations the entire pile of books or magazines is fed, not only from one compartment in a row, but successively from the various compartments; the openings 4 in which permit of the passage of the detector and reciprocating feeder. The parallel motion mechanism insures vertical movement of the carriage and proper alinement of the detector and reciprocating feeder in all positions of the carriage and at the same time affords convenient means for applying power for reciprocating the feeder.

What I claim is:

1. A book feeder comprising the combination of a book holder, a parallel motion mechanism having a fixed and a movable end, a carriage applied to the movable end of the parallel motion mechanism and tending to descend, guides for the carriage, a reciprocating book feeder carried by the carriage, a detector carried by the carriage and adapted to contact with the top surface of a pile of books, and a stop motion mechanism controlled by the detector and adapted to arrest the carriage, substantially as described.

2. A book feeder comprising the combination of a book holder, a parallel motion mechanism having a fixed and a movable end, a carriage applied to the movable end of the parallel motion mechanism and tending to descend, guides for the carriage, a reciprocating book feeder carried by the carriage, a detector carried by the carriage and adapted to contact with the top surface of a pile of books, a stop motion mechanism controlled by the detector and adapted to

arrest the carriage, and a floating frame carried by the carriage and provided with a space for the passage of a magazine or book and with a finger adapted to rest on the pile of books.

3. A book feeder comprising the combination of a book holder, a parallel motion mechanism having a fixed and a movable end and provided with belt and belt guides and a power transmission mechanism, a carriage applied to the movable ends of the parallel motion and tending to descend, guides for the carriage, a reciprocating book feeder carried by the carriage and operated from the power transmission mechanism, a detector carried by the carriage and adapted to contact with an appropriate part of the top book of a pile of books, a stop motion controlled by the detector and adapted to arrest the carriage, and a floating frame carried by the carriage and provided with gates and with a supporting finger adapted to rest on the pile of books, substantially as described.

4. A book feeder comprising the combination of a book holder consisting of a revoluble turret having compartments separated by slotted partitions and having locking means, a parallel motion mechanism having a fixed and a movable end and having belt and belt guides, a carriage applied to the movable ends of the parallel mechanism and tending to descend, guides for the carriage, a reciprocating book feeder carried by the carriage and operated from the power transmission mechanism and alined with the slots in the partitions, a detector carried by the carriage and adapted to contact with an appropriate part of the top of a pile of books and alined with the slots, and a stop motion mechanism controlled by the detector and adapted to arrest the carriage, substantially as described.

5. In a book feeder the combination of a carriage tending to descend, a revoluble shaft carried by the carriage and provided with toothed wheels and with a ratchet wheel, racks with which the toothed wheels mesh, and a detector pivoted to the carriage and having one end provided with a detent for the ratchet wheel and the other end adapted to contact with the top book of a pile of books, substantially as described.

6. In a book feeder the combination of a carriage tending to descend, rods carried by the carriage and provided with a guide, a reciprocating feeder mounted on the rods, a rod arranged through said guide, and a carriage stop motion mechanism controlled by the last mentioned rod, substantially as described.

7. In a book feeder the combination of a carriage tending to descend, rods carried by the carriage and provided with a guide, a reciprocating feeder mounted on the rods,

a spring actuated rod working through the guide, and a carriage stop motion mechanism controlled by the last mentioned rod, substantially as described.

5 8. In a book feeder the combination of a carriage tending to descend, rods carried by the carriage and provided with a guide, a reciprocating feeder mounted on the rods, a rod arranged through said guide and provided with a roller, and a carriage stop motion mechanism controlled by the last mentioned rod, substantially as described.

9. In a book feeder the combination of a carriage tending to descend, a stop motion mechanism for the carriage including a ratchet wheel, a detector consisting of a pivotal lever having a detent and an arm, a guide, a rod-working in said guide, and means for adjustably connecting the rod and arm, substantially as described.

10. In a book feeder the combination of a carriage tending to descend, guides for the carriage, means carried by the carriage for locking and unlocking it and the guides in respect to each other, and means resting on the top of a pile of books and adapted to operate the locking and unlocking means, substantially as described.

11. In a book feeder the combination of a carriage tending to descend, guides for the carriage, means carried by the carriage for locking and unlocking it and the guides in respect to each other, a feeder carried by the carriage for feeding books from the top of a pile, and means resting on the top of the pile for locking and unlocking the locking means to position the feeder in respect to the top of the pile.

12. In a book feeder the combination of a carriage, means for positioning the same in respect to a pile of books, and a frame movably connected with the carriage and provided therein with an opening for the pas-

sage of books and with a supporting finger adapted to rest on the top of the pile of books to position the opening, substantially as described.

13. In a book feeder the combination of means for raking books or magazines from the top of a pile or stack, and mechanism responsive to the height of the pile or stack including a positive locking device acting upon said means for automatically positioning said means in respect to the top of the pile or stack as the latter decreases.

14. In a book feeder the combination of means for raking books or magazines from the top of a pile or stack, means for adjusting the number of books or magazines taken, and mechanism responsive to the height of the pile of books for automatically positioning said means in respect to the top of the pile or stack as the latter decreases.

15. In a book feeder the combination of a reciprocating feeder head having rearwardly projecting fingers and a feeder movable in respect to the head and having at its lower edge fingers working between the first mentioned fingers and inside of their ends, substantially as described.

16. In a book feeder the combination of book feeding mechanism and book supporting means movable in respect to each other and upon which a continuously acting force is exerted for shifting one of said elements in respect to the other as books are fed, a locking device for locking and unlocking the movable element against said force, and a detector resting on the top of the books and adapted to operate the locking device.

In testimony whereof, I have hereunto signed my name.

WM. P. SARGENT.

Witnesses:

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FRANK E. FRENCH.