No. 745,847. PATENTED DEC. 1, 1903.

A. L. HOLTON.

PACKAGING APPARATUS.

APPLICATION FILED JULY 17, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

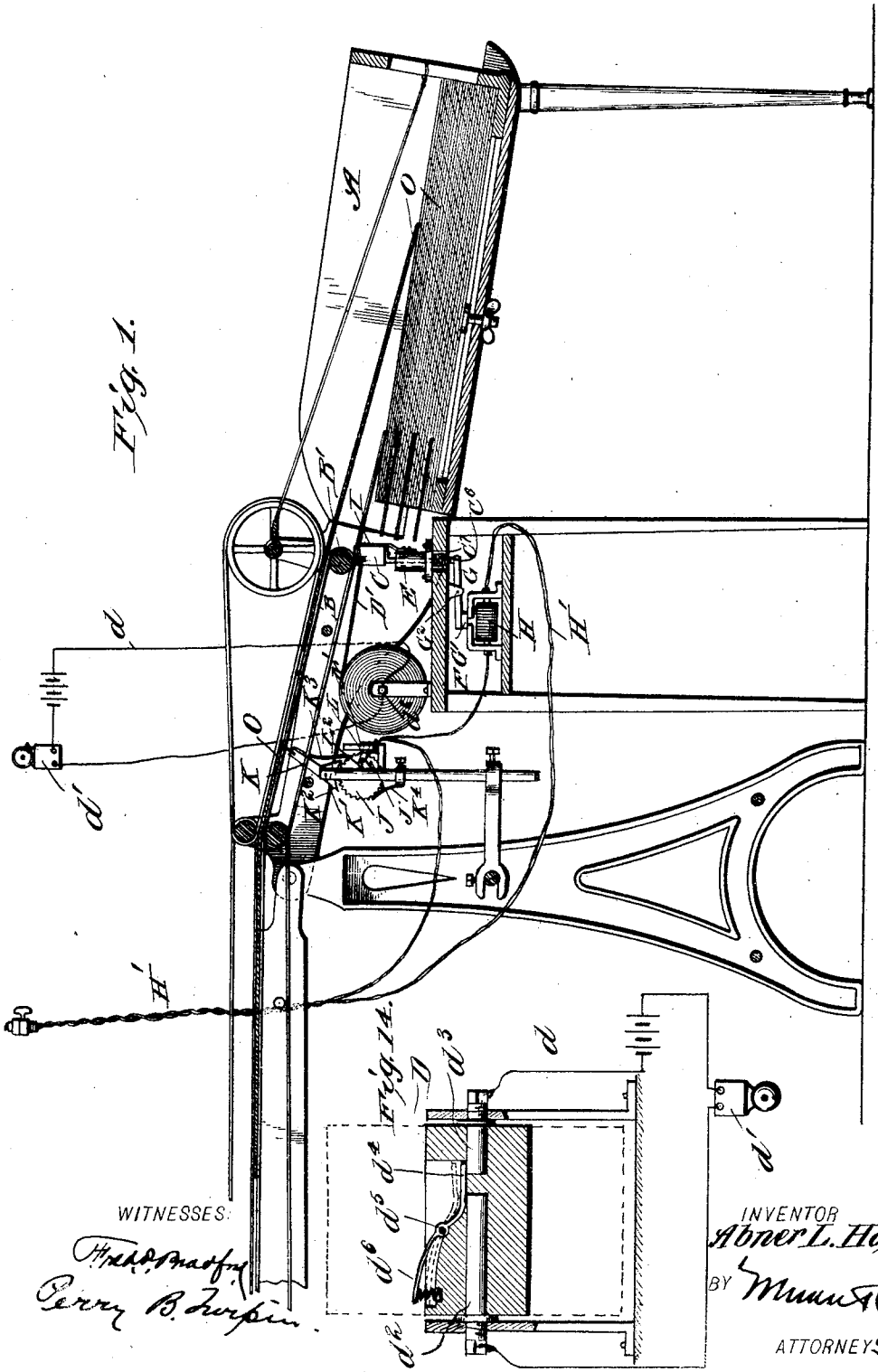


Fig. 1.

Fig. 14.

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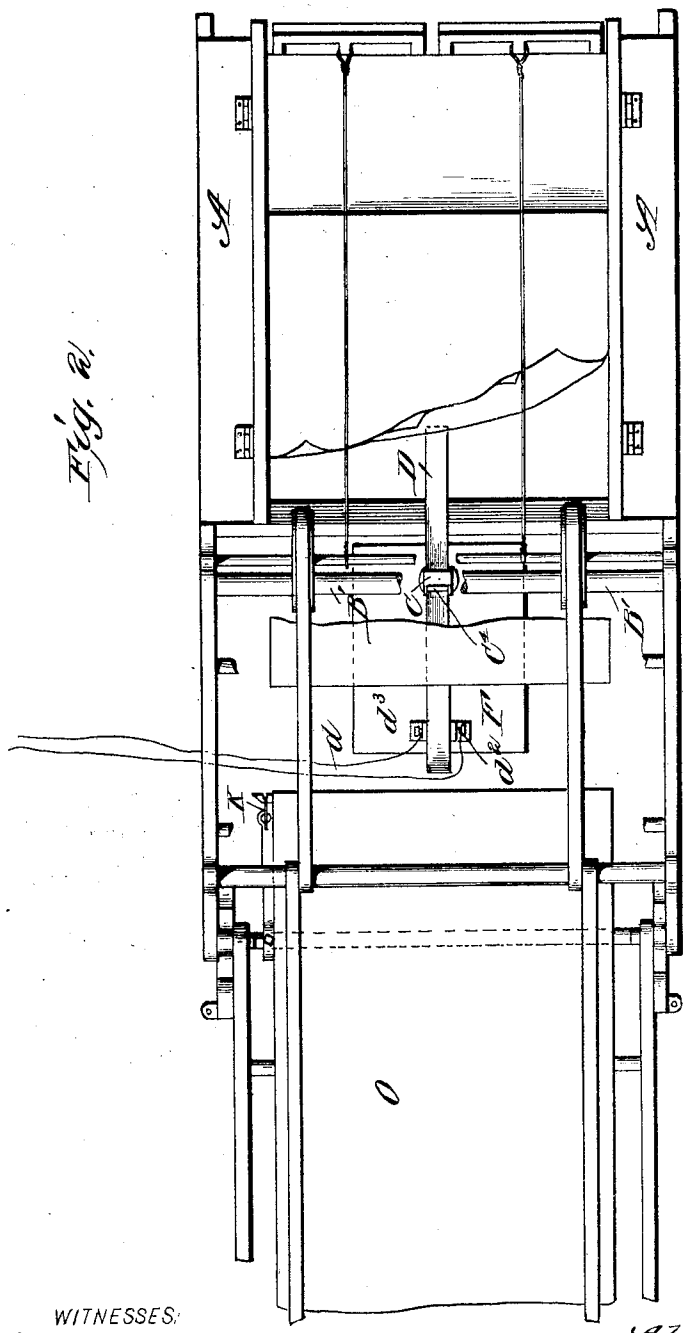
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NO MODEL. 4 SHEETS—SHEET 2.



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NO MODEL. 4 SHEETS—SHEET 3.

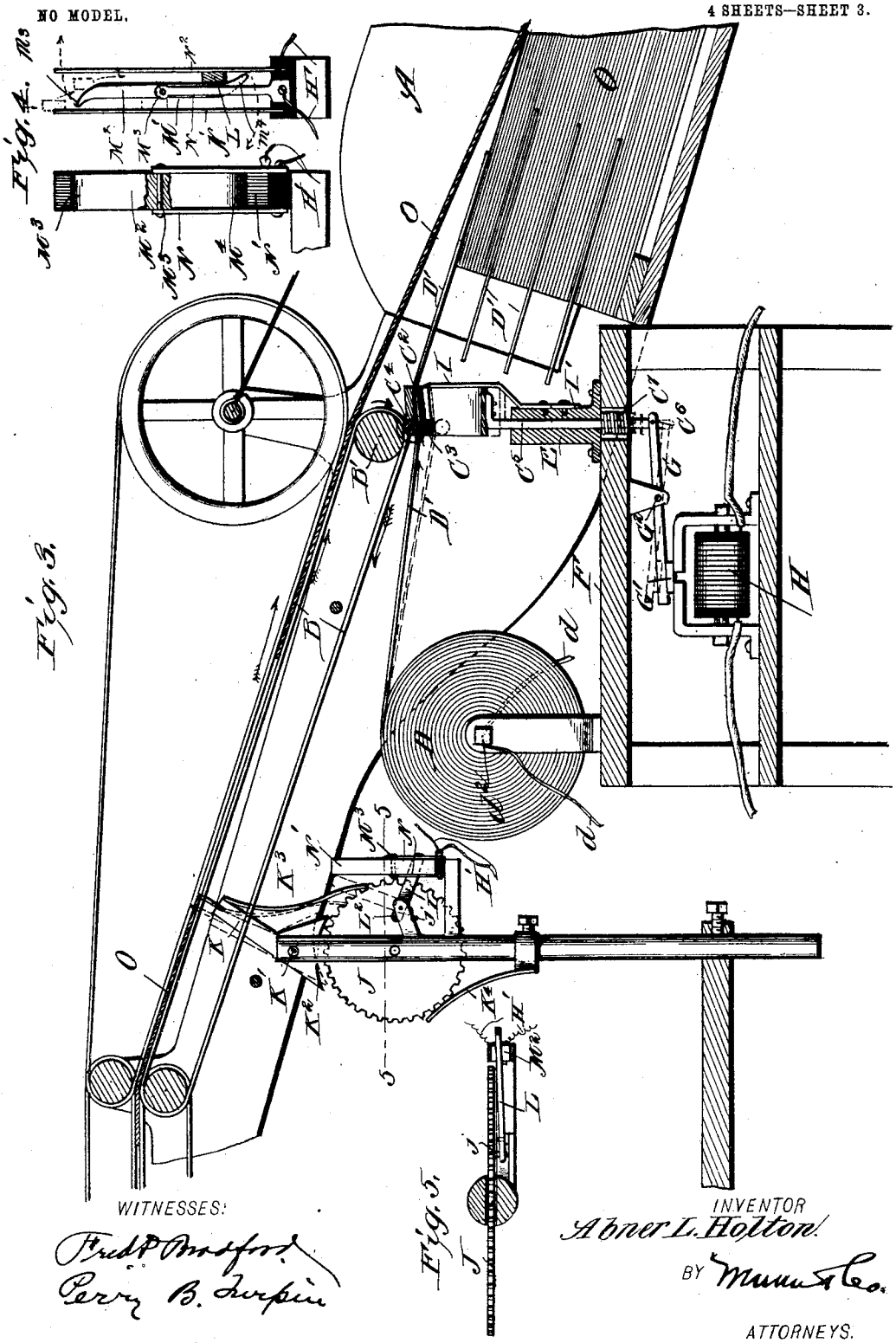


Fig. 3.

Fig. 4.

Fig. 5.

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NO MODEL. 4 SHEETS—SHEET 4.

Fig. 6.

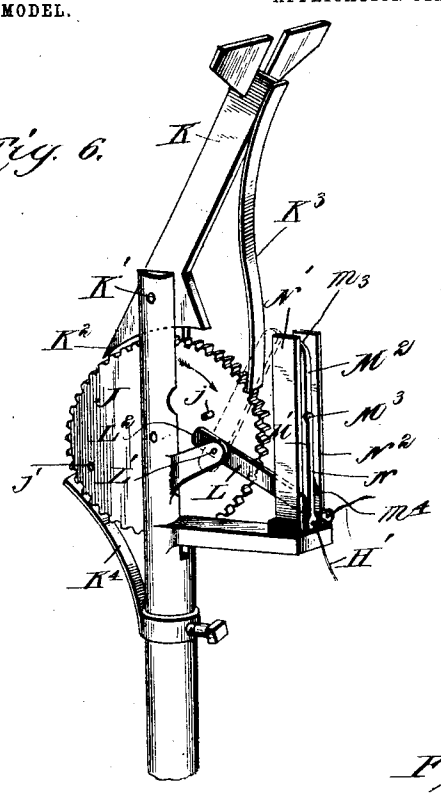


Fig. 7.

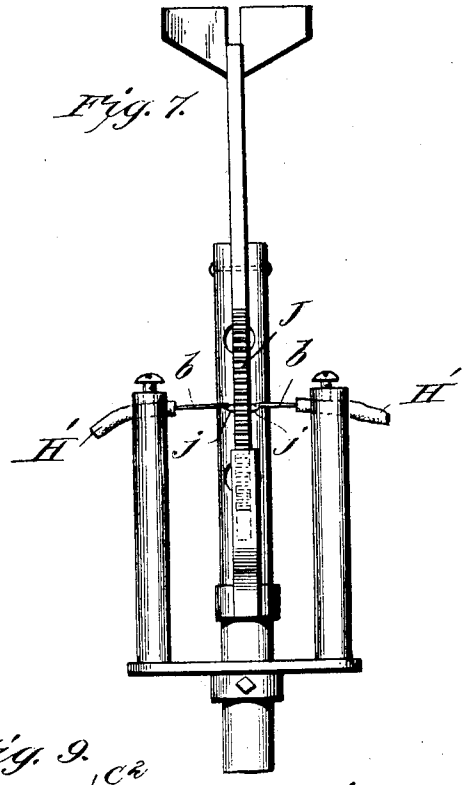


Fig. 9.

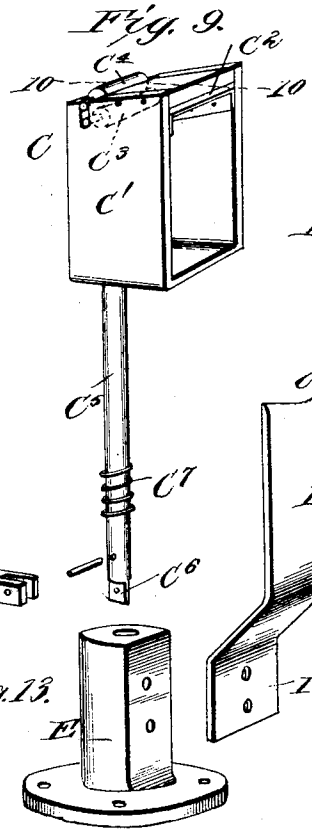


Fig. 8.

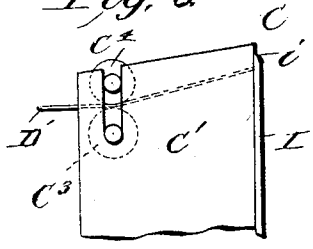


Fig. 10.

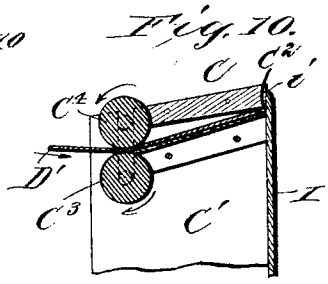


Fig. 12.

Fig. 11.

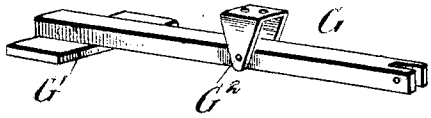


Fig. 13.

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No. 745,847. Patented December 1, 1903.

UNITED STATES PATENT OFFICE.

ABNER LINWOOD HOLTON, OF NORFOLK, VIRGINIA, ASSIGNOR OF ONE-HALF TO MIRABEAU L. T. DAVIS, OF NORFOLK, VIRGINIA.

PACKAGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 745,847, dated December 1, 1903.

Application filed July 17, 1903. Serial No. 166,000. (No model.)

To all whom it may concern:

Be it known that I, ABNER LINWOOD HOLTON, a citizen of the United States, and a resident of Norfolk, in the county of Norfolk and State of Virginia, have made certain new and useful Improvements in Packaging Apparatus, of which the following is a specification.

My invention is an improvement in packaging apparatus, being in the nature of an apparatus especially designed for use in dividing piles of note-sheets delivered from a ruling-machine into the desired number to form books; and the invention comprises means for delivering sheets or the like in piles of a predetermined number and automatically delivering separate strips to divide the piles; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a vertical longitudinal section of the rear end of a counting-machine and lay-boy provided with my invention. Fig. 2 is a top plan view thereof. Fig. 3 is an enlarged sectional view of a portion of the device shown in Fig. 1. Fig. 4 is a detail view illustrating the circuit-closer operating in connection with the counting-machine. Fig. 5 is a cross-section on about line 5 5 of Fig. 3. Fig. 6 is a detail perspective view of the counting-machine and circuit-closer. Fig. 7 is a front elevation of the counting-machine, together with a modified form of circuit-closer. Fig. 8 is a detail side elevation of the upper portion of the delivery device with the knife applied. Fig. 9 is a detail perspective view of the delivery devices for the separating-strips. Fig. 10 is a detail vertical section on about line 10 10 of Fig. 9. Fig. 11 is a detail perspective view of the armature-bar. Fig. 12 is a detail perspective view of the knife. Fig. 13 is a detail perspective view of the base for supporting the knife and guiding the stem of the carrier; and Fig. 14 is a detail sectional view of the reel, showing the same in connection with its alarm-bell and circuit.

My invention is especially designed for use in connection with ruling-machines which deliver sheets one by one to a lay-boy, and I have illustrated my invention in connection with the delivery end of a ruling-machine and a lay-boy or box A, into which the ruled sheets are delivered from the ruling-machine. It is found in the manufacture of note-books, for instance, that where it is desired to provide seventy-five or one hundred or any other predetermined number of sheets in a book it cannot be accurately accomplished by measuring the thickness of the book, and it becomes desirable to provide means for accurately determining the number of leaves in the book and for dividing off the pile of leaves delivered in the lay-boy so the number of leaves in all the books may be uniform. To this end I provide a counting device which is arranged for operation by the leaves delivered to the lay-boy and arranged in connection with said counting device and devices for delivering strips from a ribbon wound on a suitable reel to mark off the divisions between the separate books in the pile of sheets delivered to the lay-boy, as shown in Fig. 3. In the construction shown the ribbon is carried from a suitable reel through a carrier which is operated by the aid of an electric circuit from the counting device in such manner as to deliver the free end of the ribbon to the pile of sheets and then cut off the separating-strip, permitting the same to remain in the pile, as shown in Fig. 3.

In the construction shown, B indicates a belt traveling in the direction indicated by the arrow in Fig. 3 around the lower roller B′, and from this belt motion is given to the feed-roller of the carrier when the latter is elevated to deliver the end of the ribbon to the pile of sheets.

The carrier C has a head in the form of a box C′, provided with a passage C^2, through which the end of the ribbon D′ passes from the reel D, and rollers C^3 and C^4 bear below and above the ribbon, the upper roller C^4 projecting slightly above the head C′, so it may press into engagement with the belt B when the carrier is elevated to the position shown in Fig. 3. By this means the rollers C^4 will be driven in the direction of the arrow in Fig. 10 to feed the ribbon strip through the head of the carrier. Manifestly I do not desire to

be limited in the broad features of my invention to this specific means of giving motion to the feed-roller C^4, as said roller may be moved in the open position of the carrier into engagement with some other moving part of the machine. The carrier C has a shank C^5, which extends down through a guide E, mounted on a fixed support F, and below said fixed support to connect at C^6 with one end of the armature-lever G, whose other end is provided with the armature G', said lever being pivoted at G^2 between its ends, so that as its plate G' is attracted by the magnet H the carrier will be forced upward to set its roller C^4 into engagement with the drive device. A spring C^7 is provided for quickly readjusting the carrier from its upper position (shown in Fig. 3) to its lower or normal position, as indicated by the dotted lines in the same figure. The knife I operates alongside the carrier-head C' and is held to a fixed support, preferably to the guide E at I', as shown in Fig. 3, and the edge *i* of said knife is arranged to operate alongside the discharge end of the passage C^3 when the head C' lowers to the dotted-line position (shown in Fig. 3) and cut off the strip which has been delivered between the sheets, as will be understood from Fig. 3. Thus in operation when the ruling devices are in motion and the magnet H is energized the carrier will be lifted to the full-line position (shown in Fig. 3) and the separating-strip will be fed from the reel to a position over the sheets in the lay-boy A. Then as the circuit is broken and the magnet ceases to attract the armature G' the carrier will be readjusted to its normal position, moving down past the knife I, which will cut off the separating-strip and leave the same upon the pile of sheets until the next operation of the carrier, which will not occur until the magnet H is again energized by the closing of its circuit through the means presently described.

The reel D has the ribbon D' wound upon it, and in order to sound an alarm when the ribbon has been wound from the said reel I provide an electric circuit *d*, including a bell *d'*, and having terminals d^2 and d^3, which are united when the ribbon is wound from the reel by one end, d^4, of a lever, which is pivoted at d^5 and has its other end, d^6, spring-actuated and pressed outwardly by its spring when the ribbon is wound from the reel, permitting arm d^4 to connect the terminals d^2 and d^3, as indicated in full-line position, Fig. 14. When the ribbon is wound upon the reel, it will press the arm d^6 against the tension of its spring into the drum and adjust the lever on its pivot d^5 to the dotted-line position, (indicated in Fig. 14,) thus breaking the circuit *d*, which will not be closed until the ribbon has been wound from the reel and the arm d^6 can again be pressed outwardly by its spring to cause the arm d^4 to connect the terminals, as will be understood from Fig. 14. By this means an alarm is sounded at once when the ribbon furnishing the separating-strips is exhausted.

The counting device is shown in Figs. 1 and 3 and in detail in Fig. 6 and includes a toothed wheel J, suitably journaled and arranged to be given a movement step by step by the lever K, which is pivoted at K' and has an escapement end K^2 and a spring-plate K^3, operating upon the wheel J to move the same step by step, a detent K^4 being provided to prevent any retrograde movement of the wheel J. Manifestly this wheel may be toothed to any desired extent, according to the number of leaves it may be desired to count into each package, and I provide a circuit-closer in the circuit H', which includes the magnet H and for operating said circuit-closer from the wheel J. In Fig. 7 I show the terminals *b* of the circuit H' extending on opposite sides of the wheel J and supply projections *j* on said wheel J to contact with the terminals *h* and close the circuit H' when said projections *j* are in contact with the terminals *h*, as shown in Fig. 7. At this instant the magnet H will be energized and the armature will be attracted to raise the strip-carrier into position in which its roller C^4 will be driven to feed the separating-strip. It will be understood, however, that if the counting-wheel J should be stopped with the parts in the position shown in Fig. 7, with its projections *j* in contact with the terminals *h*, the ribbon would be fed entirely from the reel, and to avoid any such operation I prefer to employ the closer shown in Figs. 4, 5, and 6 and which I will now describe. In this construction a circuit-closing lever L is pivoted at L' and has its inner arm L^2 arranged for engagement by the projections *j* on the wheel L, so that as the wheel revolves in the direction of the arrow in Fig. 6 it will tilt the lever L from the full-line position shown in said figure to the dotted-line position indicated in the same figure. At its outer end the lever L travels up in the passage M' on one side of a rocking switch M^2, which latter is pivoted at M^3 to one, N, of the terminals of the circuit H', the other terminal, N^2, of said circuit being a plate extending alongside the terminal N and separated sufficiently therefrom to permit the outer end of the lever L to drop down between said terminal N^2 and the switch M^2, as will be understood from Fig. 4. This switch M^2 has its opposite ends m^3 and m^4 deflected to form guides for the outer end of the lever L, so the said lever may travel up in the passage M' on one side of the switch M^2 and then down on the other side of said switch between the latter and the terminal N^2, closing the circuit H during the latter movement, and descend at its outer end at the end of its downward movement below the deflected end M^4 of the switch and clear of both terminals of the circuit H', as best shown in Fig. 6. Thus the circuit H'

will only be closed during the descent of the outer end of the lever L, so it will be impossible for any permanent closing of the circuit no matter what the position of the counting device may be.

In operation it will be noticed the leaves as they are discharged at O will operate upon the upper end of the lever K and will move said lever to operate the wheel J one step, and when the predetermined number of leaves have passed the circuit H will be closed and the carrier and guiding devices will be operated to feed the separating-strip to the pile of leaves in the lay-boy and to cut the same from the ribbon, leaving the strips remaining separating the pile into the desired divisions, as will be understood from Fig. 3 of the drawings.

It will be understood that instead of providing counting-wheels with different numbers of teeth in order to count different-sized piles of sheets I may provide for duplicating the circuit-closers *j* upon the wheel, so that a wheel with one hundred teeth could be made to count ten, twenty, thirty, or forty to a pile by inserting extra circuit-closing projections to raise the lever at various intervals. Thus in Fig. 6 I show the wheel provided with an opening *j'*, arranged diametrically opposite the projection or pin for operating the circuit-closer, said pin *j* being fitted in a similar opening *j'* and a similar pin being in practice provided to insert in the diametrically opposite opening *j'* when desired. It will be understood that these openings *j'* may be duplicated to any desired extent.

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

1. An apparatus having means for delivering sheets or the like in piles of a predetermined number and automatically-operated means for delivering separating-strips between said piles, and means for controling said strip-delivering means by the sheets delivered to form the piles.

2. The combination of means for delivering sheets, means for counting the sheets, devices independent of the sheet-delivering means for delivering separating means between the packages of counted sheets and means for operating said delivery devices for the separating means.

3. An apparatus comprising means for delivering the sheets, means for counting the sheets having devices arranged for direct operation by the delivered sheets, devices for delivering separating means between the packages of counted sheets, and means for operating the said delivery devices for the separating means from the counting means.

4. An apparatus comprising means for delivering the end of a strip between counted piles and means for severing said strip whereby it may be left between the piles and divided strips will be delivered successively from the same ribbon between succeeding piles substantially as described.

5. An apparatus comprising devices for delivering sheets and the like in piles, and means independent of and operated from said delivery devices whereby to deliver separating-strips independent of the sheets to be separated between the piles.

6. An apparatus having counting means whereby sheets may be delivered in packages of predetermined number, said counting means having devices for direct operation by the delivered sheets and devices controlled by the counting means for delivering separating-strips to separate the packages.

7. The combination of a drive device, a carrier for the end of a ribbon, said carrier being movable, a feed-roller for said ribbon mounted in the carrier and arranged to be set by the movement of the carrier into engagement with the drive device and means for severing a separating-strip from the fed ribbon.

8. An apparatus substantially as herein described comprising a carrier having a feed-roller and a passage for a fed ribbon, a guide in which said carrier is movable longitudinally whereby its roller may be set into engagement with a feeding device, an electromagnet and armature for operating said carrier, and a knife fixed relatively to the carrier whereby to operate when the carrier is moved substantially as set forth.

9. The combination substantially as herein described of the counting devices, an electric circuit including a magnet, a closer for said circuit arranged for operation by the counting devices, and devices adapted to feed a separating-strip to the pile of sheets counted by the counting devices, and means for operating said feeding devices from the electromagnet substantially as described.

10. The combination of the devices for delivering a separating-strip, an electromagnet for moving said devices, a circuit including said electromagnet, a closer for said circuit having a switch-bar and a lever arranged to operate upon said switch-bar, the counter for moving said lever and operating means for the delivery devices substantially as set forth.

11. The combination substantially as described, of counting devices, feeding devices adapted to feed a separating-strip to a pile of sheets counted by the counting devices, means controlling the strip-feeding devices from the counting devices, and means for severing the separating-strip after it has been delivered to the pile of sheets.

12. The combination with the carrier for delivering the separating-strip, of the magnet for moving said carrier, the circuit including said magnet and having the terminals, the switch connected with one of said terminals, the lever arranged to move in one direction of movement between the terminals and to be

guided in said movement by the switch, and the counting devices for moving said lever substantially as set forth.

13. The combination of the carrier for the separating-strip having a feed-roller and provided with a shank, a guide for said shank in which the latter is movable longitudinally, a spring for moving the carrier in one direction and a magnet for moving the carrier in the opposite direction substantially as set forth.

14. The combination of means for delivering sheets and the like in piles, the carrier for the separating-strip provided with means for feeding the strip between the sheets of the pile, and a cut-off device operating in connection with said carrier substantially as set forth.

15. The combination of means for delivering sheets and the like in piles, the carrier for the separating-strip having the passage for the strip and means for feeding the strip between the sheets of the pile and the cut-off device operating alongside the carrier in advance of the feed devices substantially as set forth.

16. The combination of the counting devices, an electromagnet, a circuit including said electromagnet, a closer for said circuit arranged for movement by the counting devices, a movable carrier for the separating-strip, means whereby said carrier may be moved by the magnet in the said circuit, a cut-off device operating in connection with the carrier, and a reel for the ribbon of the separating-strip having a circuit-closer arranged to be held open by the ribbon wound on the reel substantially as set forth.

17. The combination of the carrier having a passage for the separating-strip, the armature-lever pivoted between its ends and connected at one end with the carrier and having the armature at its opposite end, the magnet operating upon said armature, an electric circuit including said magnet and means for closing said circuit substantially as set forth.

18. The combination of a carrier for the separating-strip, a counting device arranged for operation by the sheets, and means for operating the carrier for the separating-strips from the counting devices substantially as set forth.

19. An apparatus substantially as described comprising a counting device and means operated from the counting device for delivering separating-strips to separate the pile into desired divisions, substantially as set forth.

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Witnesses:

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