No. 667,287. Patented Feb. 5, 1901.

J. H. BATCHELDER.

CELL CASE MACHINE.

(Application filed Nov. 27, 1899.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 2.

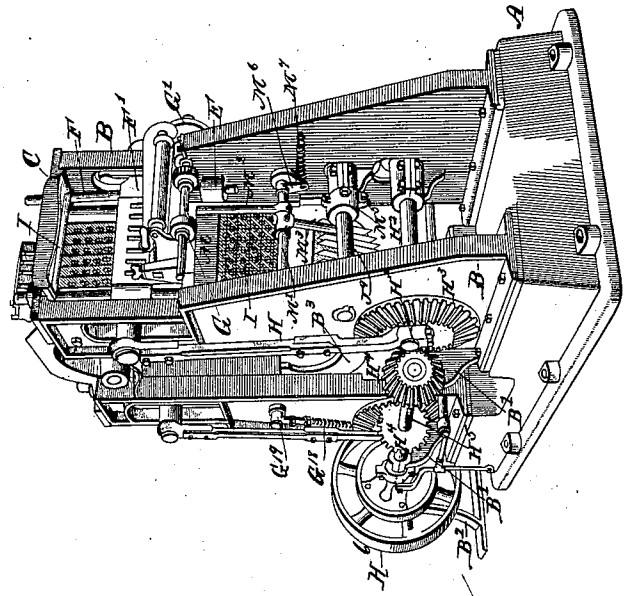
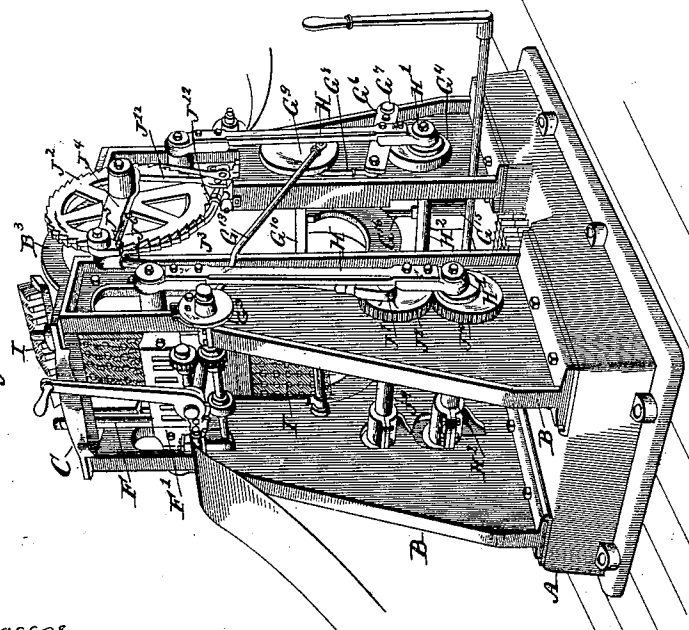


Fig. 1.



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Fig. 3.

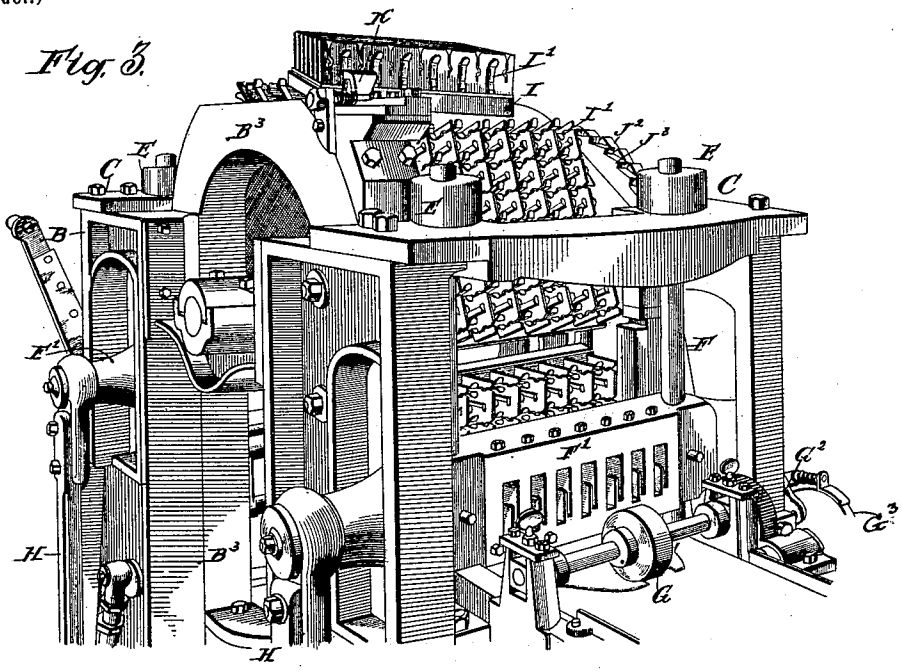
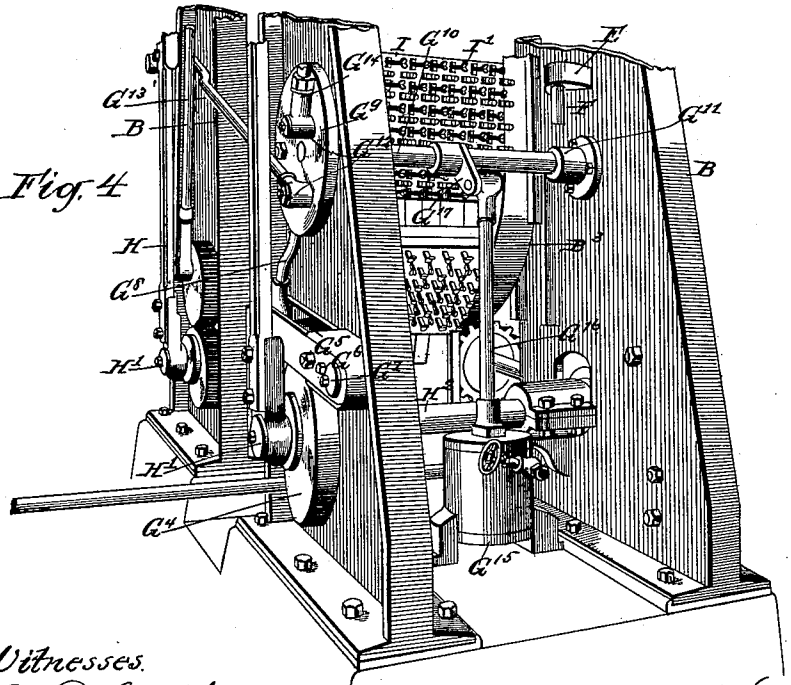


Fig. 4



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Fig. 6.

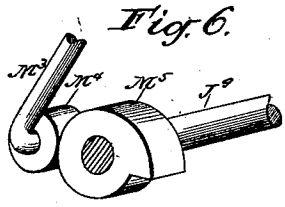
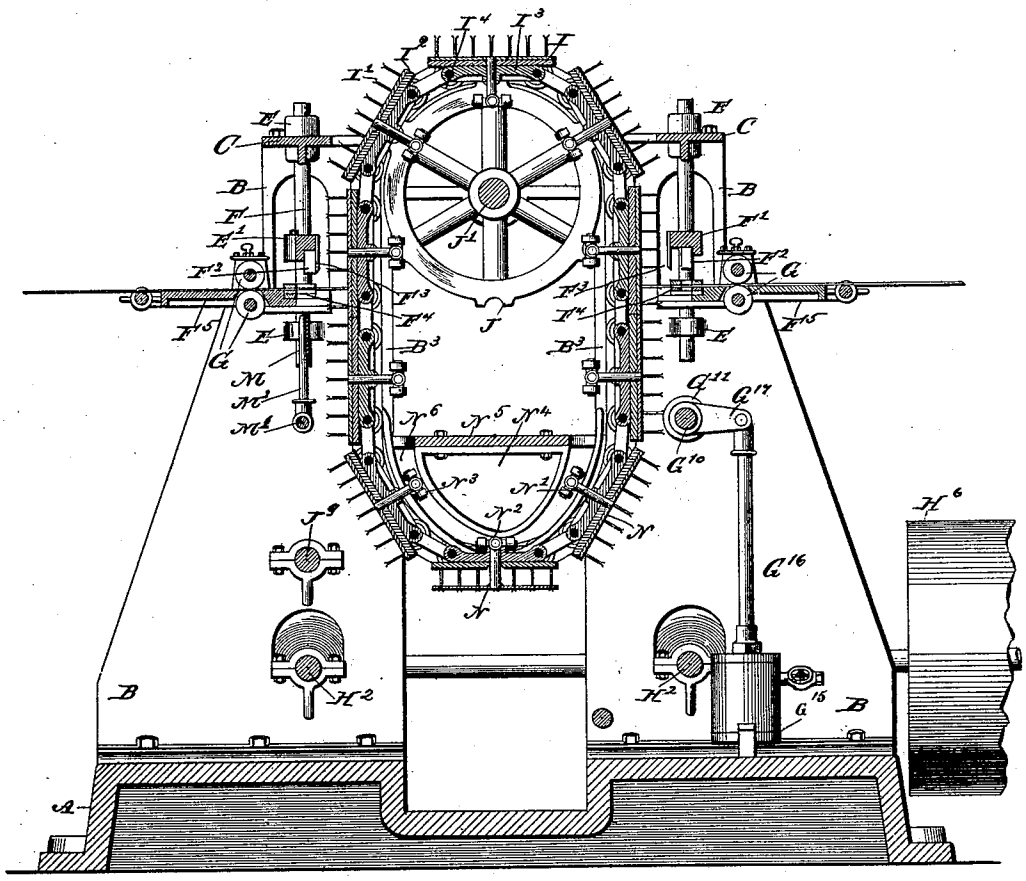


Fig. 5.



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(No Model.) 4 Sheets—Sheet 4.

Fig. 7.

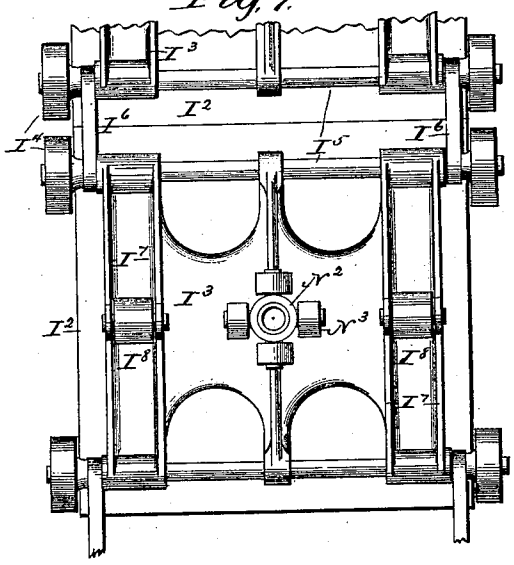


Fig. 8.

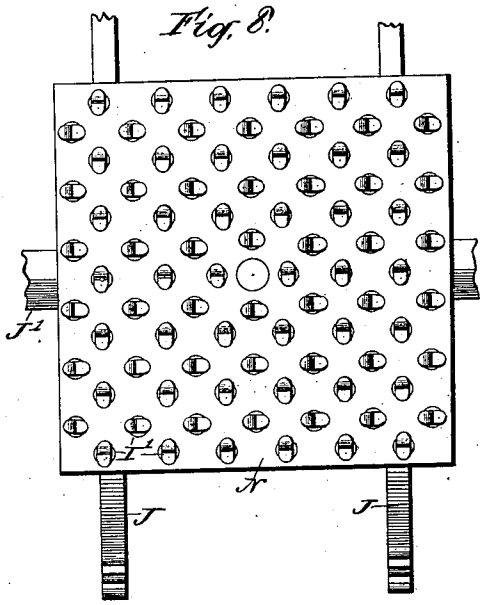


Fig. 9.

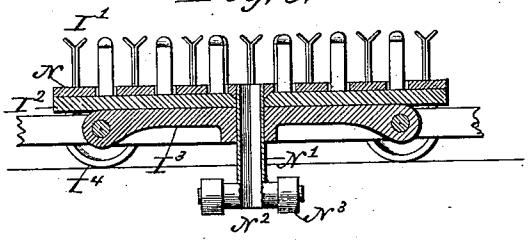
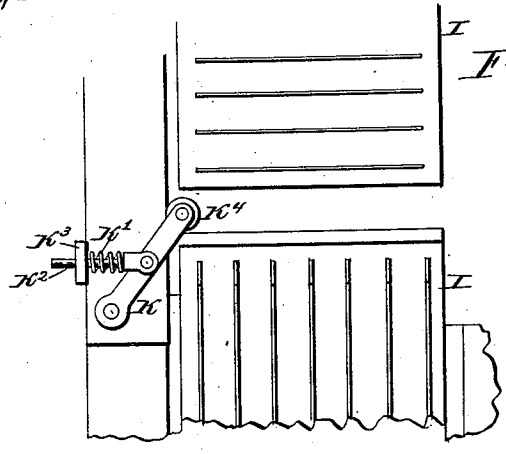


Fig. 10.



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UNITED STATES PATENT OFFICE.

JAMES H. BATCHELDER, OF TAMA, IOWA.

CELL-CASE MACHINE.

SPECIFICATION forming part of Letters Patent No. 667,287, dated February 5, 1901.

Application filed November 27, 1899. Serial No. 738,277. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. BATCHELDER, a citizen of the United States, residing at Tama, in the county of Tama and State of Iowa, have invented certain new and useful Improvements in Cell-Case Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that type of automatic machines for making and interlocking the strawboard strips for egg-cell cases in which the respective strips are punched by a pair of punch-heads, one on each side of the machine, the severed strips are carried by suitable holders from the initial punch to the top of the machine, where the strip-carrier is turned ninety degrees, the cross-strips are at the other punch-head interlocked with the initial series and cut off, and the completed cell-case is finally discharged at the bottom of the machine.

This invention has for its object to improve the feed mechanism, the mechanism for turning the strip-carriers one quarter of a revolution, the carrier-actuating mechanism, the cell-case ejector, and other details in a machine of this type, as will fully appear from the description and claims following, reference being had to the accompanying drawings, in which—

Figure 1 is a general view in perspective of a machine embodying my improvements. Fig. 2 is a similar view of the same as seen from the other side. Fig. 3, Sheet 2, is a larger view of the upper part of the machine as shown in Fig. 2, but from a more elevated point of view. Fig. 4 is a fragmentary perspective view showing parts near the base of the machine on the side opposite to Fig. 3. Fig. 5, Sheet 3, is a central section of the machine longitudinal to the base. Fig. 6 illustrates the cam and a part of the depending arm connecting with the slapper or strip bottoming device. Fig. 7, Sheet 4, is a rear elevation showing one of the strip-carrier trucks and its connection with another. Fig. 8 is a front view of one of the strip-carriers. Fig. 9 is a central section of the same and its truck. Fig. 10 is an ideal plan view of the quarter-turn mechanism.

Similar characters of reference indicate corresponding parts.

In its main features the machine has the characteristics of the machine described in Patent No. 619,267, issued to me on the 14th day of February, 1899; but in the present invention instead of cutting simultaneously the whole number of strips in the cell-case the machine cuts but two at a time. Other changes in construction and novel features will appear in the description and claims following.

On a suitable base A are mounted four standards B, connected at their upper ends by bridges C. These standards and bridges are provided with suitable bearings E for guide-rods F, to which are secured the punch-heads F′, provided with suitable punches F^2 and a shear-blade F^3 to sever the punch-strip. These coact with dies F^4, attached to a table F^5, suitably secured to the standards. On this table are mounted the feed-rolls G, to which an intermittent motion is given by an oscillating disk G′, carrying a pawl G^2, engaging a ratchet G^3 on one of the roll-shafts.

A regular reciprocating movement is imparted to the punch-heads by connecting-arms H, coupled to cranks H′ on cross-shafts H^2. These shafts are provided with bevel-gears H^3, engaging pinions H^4, secured to a shaft H^5, journaled in bearings B′ and B^2 and provided with a suitable drive-pulley H^6. On one of these shafts H^2 is mounted a cam G^4, which engages a roll G^5 on a reciprocating arm G^6, pivoted on a stud G^7 at the side of the machine. The free end of this arm connects by a link G^8 with a disk G^9, secured to a rock-shaft G^{10}, journaled in bearings G^{11}. From cranks G^{12} the oscillating motion of the disk is transmitted to the feed-roll disks through the medium of connecting-rods G^{13} and G^{14}, as clearly indicated in Figs. 1 and 4.

A further improvement in the feed mechanism is shown in Figs. 4 and 5. The cam G^4 is similar to that shown in Fig. 6 to give a very quick return to the feed-pawls, as the time for this feed is limited, being only about one-fifth of a revolution of the main crank-shafts.

This quick return of the pawl and actuating mechanism when running at as high a speed as is desired would produce a very detrimental jar if no provision were made for cushioning the stroke. This is done by means of a dash-pot G^{15}, whose piston G^{16} connects with a crank G^{17} on the rock-shaft G^{10}. This dash-pot is of a simple and well-known type and need not be particularly described. The return movements of the feed mechanism are caused by a powerful spring G^{18}, one end of which connects at some suitable point to the frame of the machine and the other end with a crank-pin G^{19} on the said rock-shaft, as shown in Figs. 2 and 3. By this means the necessary quick action of the feed is secured without injurious vibration.

In common with the machine described in my former patent a series of carriers I are employed to receive the cell-case strips between their holding-fingers I′ and convey them from the points where the strips are so received to the point of ejection. In the case of both the primary strips cut from the strawboard sheets 1 (part of a roll of strawboard not shown) and the cross-strips cut from the sheet 2 at the opposite side of the machine the most of the strip is fed between the holding-fingers before being cut off. The carrier-fingers are attached to a rectangular table I^2, centrally pivoted on a truck I^3, having four wheels I^4, traveling in an oblong circular-ended track B^3 at each inner side of the machine. The detail of the carrier is best shown in Figs. 7, 8, and 9. In each end of the truck-frame I^3 is secured an axle I^5, and on the outer ends of these axles are mounted the wheels I^4. Between the wheels and the truck-frame are links I^6 of exact and uniform length, connecting each pair of trucks in the whole series, the number in this machine being ten. By reference to Fig. 5 it will be seen that when any two of the carriers are in the same plane their adjoining edges lie close together and the spacing of the fingers from one to another is uniform with the spacing on each separate carrier, so that through the whole circuit of the carriers their intermittent forward movement is exactly uniform. Near each side of the truck-frame is a pair of ribs I^7, and between these is mounted at each side and at the longitudinal center an anti-friction-roll I^8, adapted to engage a sprocket-wheel J, coinciding therewith and secured to a cross-shaft J′ near the upper end of the machine. The use of a sprocket at each side of the carriers insures perfect steadiness in the movement of the carriers and prevents the possibility of their getting out of alinement.

Intermittent motion is imparted to the sprocket-wheels and their connected train of carriers by the following mechanism: To the cross-shaft J′ is secured a ratchet J^2, an adjoining reversed ratchet J^3 being also provided to prevent any backlash. On the projecting portion of the shaft is pivoted an arm J^4, and near one end of this is mounted a pawl J^5 to engage the ratchet J^2. To the adjacent end of the arm is connected a rod J^6, the other end of which couples to a crank J^7 on one of a pair of elliptical gears J^8, attached to a cross-shaft J^9. This gear meshes with a similar gear J^{10} on the shaft H^2, the purpose of the elliptical gearing being to give a relatively slow forward movement to the carriers with a quick return of the actuating mechanism. To the other end of the arm J^4 is connected a link J^{11}, coupled at the lower end to a pivoted pawl J^{12}, adapted to engage the teeth of the ratchet-wheel J^3. These pawls are so adjusted with respect to each other that the pawl J^3 engages a new tooth on the reversed ratchet at the extreme limit of the movement of the other pawl forward, and thus serve as a positive stop to any further forward movement of the train of carriers due to their own momentum. By placing the ratchets side by side instead of on opposite sides of the machine this feed mechanism has been materially simplified and improved, as the stop-pawl is now connected with the same arm as the feed-pawl.

In Fig. 3 the quarter-turning device is shown in action, and Fig. 10 is an illustrative plan of the same.

K is an arm pivoted to some suitable part of the main frame at the top. A spring K′ is mounted on the stem of a fork K^2, hinged to the arm, and its other end abuts on a shoulder K^3, which serves as a guide for the fork. At the free end of the arm is a roller K^4, adapted to pass between two connected carriers, and in making the turn over the semicircular part of the track they gap apart, as shown in Figs. 3 and 5. It is to be understood that at the upper end of the track there is space for the carrier to turn around in; but as it passes to the vertical part of the track it is held in alinement by the adjacent track, this feature being shown in the former patent above referred to. The action of the device will now be apparent. In Fig. 10 the lower of the carriers is supposed to be prevented from further turning by the adjacent tracks. As soon as this carrier has passed below the roller K^4 the latter automatically swings inwardly between it and the one following. The roller then engages the corner of the succeeding carrier, and as it advances it is turned one-fourth of a revolution, when it in turn enters the space occupied by the lower carrier and is held from further turning. The device is not only very simple in structure, but the action is very easy and smooth, occupying, as it does, the time required to feed the train of carriers forward half the length of one of them—that is to say, seven revolutions of the present machine.

Below the table which supplies the cross-strips to complete the cell-case is mounted a slapper M, connecting with a rock-shaft M′ by

arms M^2. A depending arm M^3, provided with a roller M^4, is also attached to the rock-shaft, and the roller travels on the periphery of a cam M^5, attached to the cross-shaft J^9. To another arm M^6 is connected a spring M^7, secured at the other end to the machine-frame. This spring gives the forward or inward impulse to the slapper as soon as the roller passes the highest point of the cam, which is supposed to turn in the direction indicated by the arrow in Fig. 6. The slapper-plate spans two parallel strips, and as it acts at each revolution of the machine each strip in the carrier receives two blows, whereby all are perfectly bottomed in the carriers and interlocked.

The mechanism for ejecting the finished cell-case is best illustrated in Figs. 5, 7, 8, and 9. On the outer face of each carrier-table is mounted a stripper-plate N, having a central axle N', which for the sake of lightness is made tubular, passing through the central hub of the carrier. To the inner end of this axle is secured a cross N^2, with a roller N^3 mounted on each arm. Near the lower end of the machine a pair of cam-plates N^4 are secured to a bridge N^5, fixed to the main frame. The channels N^6 of these cams form paths for a pair of the rollers however the carriers may be turned. These channels are coincident with the normal positions of the rollers at their upper ends, but curve downwardly until at their lowest point, corresponding practically with the middle of the machine, they thrust the stripper-plate downwardly nearly the full length of the carrier-fingers. The effect is of course to eject the finished cell-case, and the action is performed very gradually without any shock whatever, and by the use of a broad flat surface bearing against the edges of the strips. There is thus no possibility of injury to the completed cell-case, which drops gently and of its own weight on the open space made to receive it in the middle of the machine-base. Hitherto much of the trouble in the operation of a cell-case machine has been due to the ejector, which by the suddenness of its action and its limited surface exposed to the cell-case has tended to break the cell-case more or less. The injury to the particular cell-case was not so serious as the leaving of pieces of strawboard lodged between the carrier-fingers to obstruct the succeeding strip, whereby the carrier would become clogged and the machine would need to be stopped and the obstruction removed. This difficulty is entirely removed by the ejector above described.

The efficiency of this machine is due in no little measure to the fact that the punching and cutting are done by both punch-heads simultaneously, instead of alternately, as in my former machines. This construction allows more time for the operation of the strawboard and carrier feeds and the action of the bottomer, and thus admits of a relative increase in the speed of the machine.

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

1. In a cell-case machine, feed mechanism substantially as described, comprising a pair of feed-rolls, a ratchet on one of the roll-shafts, an oscillating pawl coacting therewith, a connection of said pawl with a rock-shaft, a connection of said rock-shaft with a driving-cam adapted to impart forward movement to the feed, a spring to retract said rock-shaft, and a dash-pot to cushion the impact of the recoil due to the action of said spring.

2. In a cell-case machine having feeding, punching and cutting mechanism, substantially as described, strip-conveying mechanism comprising a series of carrier-tables provided with strip-holding fingers, truck-frames on which said tables are centrally pivoted, provided with axles and travelers near each end, a pair of links connecting the axles of adjacent carriers, antifriction-rolls near the sides of each truck-frame, a pair of sprockets adapted to engage therewith, and a track with semicircular ends forming a pair of guides for said travelers, one on each side of the machine.

3. In a cell-case machine, the combination with a train of revoluble carriers, of a quarter-turning device consisting essentially of a yielding arm adapted to spring inwardly between a connected pair of carriers and intercept the corner of one of them and turn it one-fourth of a revolution as the train advances.

4. The described quarter-turning device, comprising a pivoted arm, an antifriction-roll at the free end of it, and a spring adapted to swing the roll inwardly between a connected pair of advancing carriers and intercept it in its forward movement.

5. In a machine of the type specified, carrier-feed mechanism substantially as described, comprising sprockets engaging the train of carriers, a pair of ratchets mounted side by side on the sprocket-shaft, an oscillating arm adjacent to said ratchets, a pawl near one end of said arm to engage the feed-ratchet, another pivoted pawl to engage the adjacent ratchet to form a positive stop to the movement of the carriers, a connection of the other end of the arm therewith, and a connection of the said arm with suitable driving mechanism.

6. In a cell-case machine, the described slapper or strip-bottom device, comprising a rock-shaft, a slapper-plate adapted to cover two or more strips attached by arms thereto, a roll-carrying arm extending from said shaft to an actuating-cam, a cam to engage said roll and retract the slapper-plate, and a spring adapted to actuate the slapper inwardly and against the cell-case strips.

7. A cell-case ejector comprising a series

of holding-fingers for the strips, a perforated stripper-plate through which said fingers pass, a backwardly-extending axle with lateral extensions at the back end, and a fixed cam adapted to engage said stem and force the stripper-plate outwardly to eject the cell-case as the carrier advances.

8. The combination with a strip-carrier, substantially as described, having a series of strip-holding fingers, of a stripper-plate perforated to receive said fingers, a central axle attached thereto, a cross at the inner end of said axle and a pair of fixed cams adapted to engage opposite arms of said cross and force the stripper-plate outwardly as the carrier advances.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES H. BATCHELDER.

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