

No. 880,845.

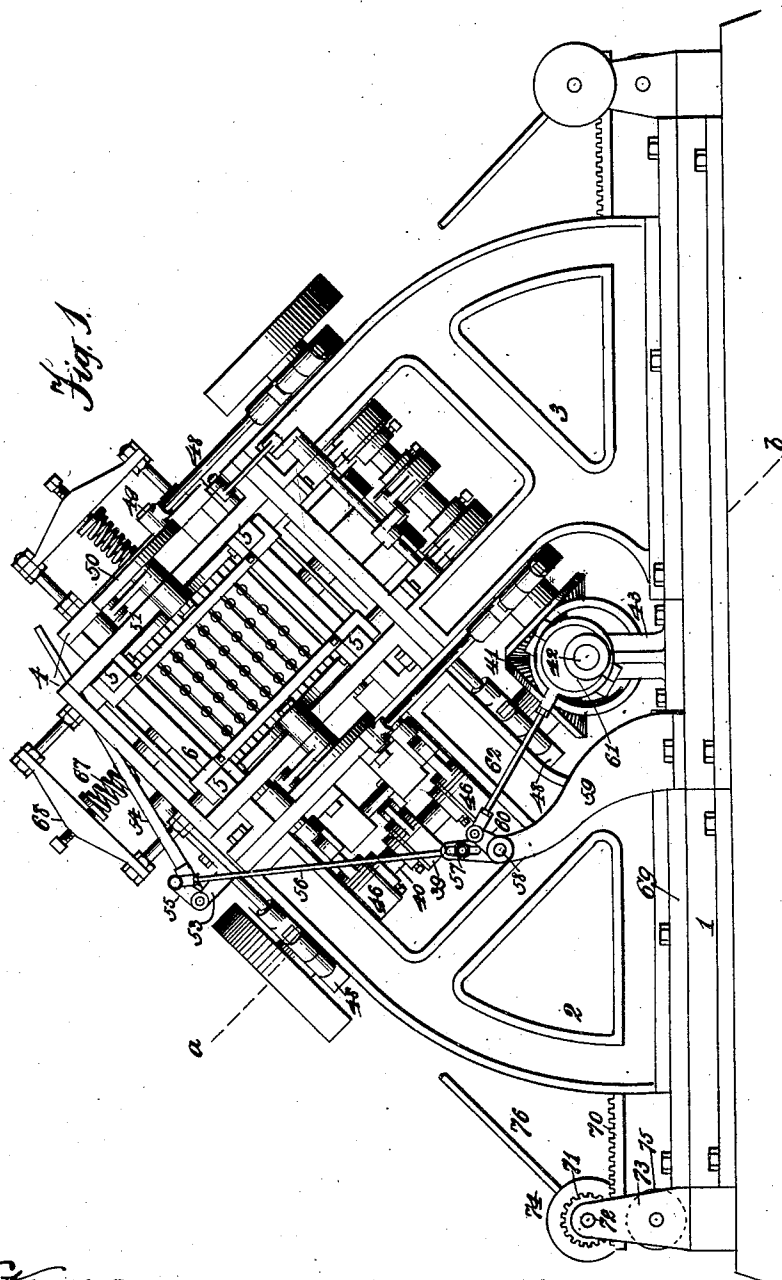
PATENTED MAR. 3, 1908.

A. W. D. WEIS & J. STARMAN.

CELL CASE MACHINE.

APPLICATION FILED MAR. 10, 1906.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

Fig. 2.

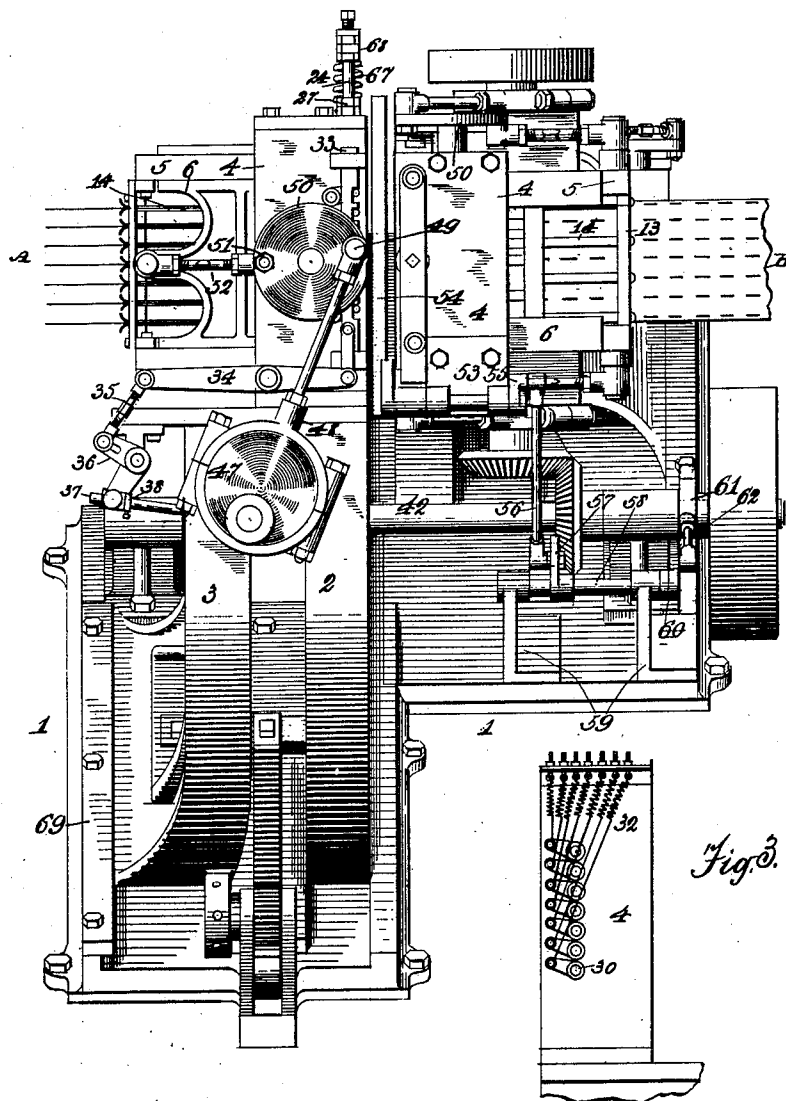


Fig. 3.

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4 SHEETS—SHEET 3.

Fig. 5.

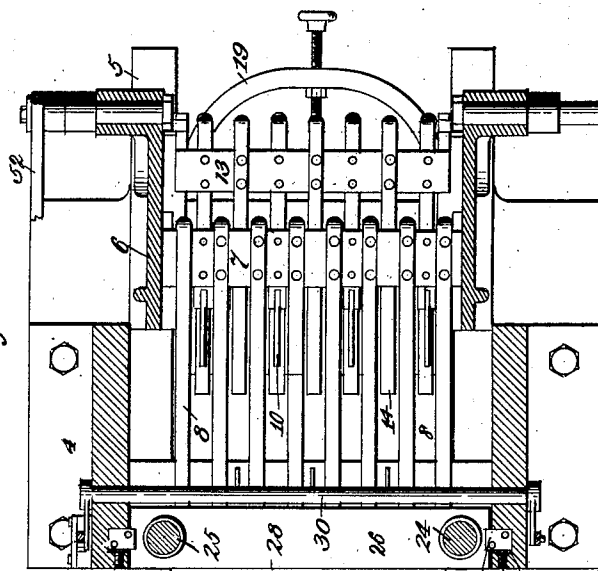


Fig. 6.

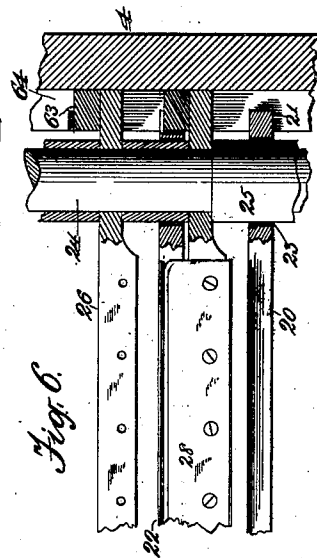
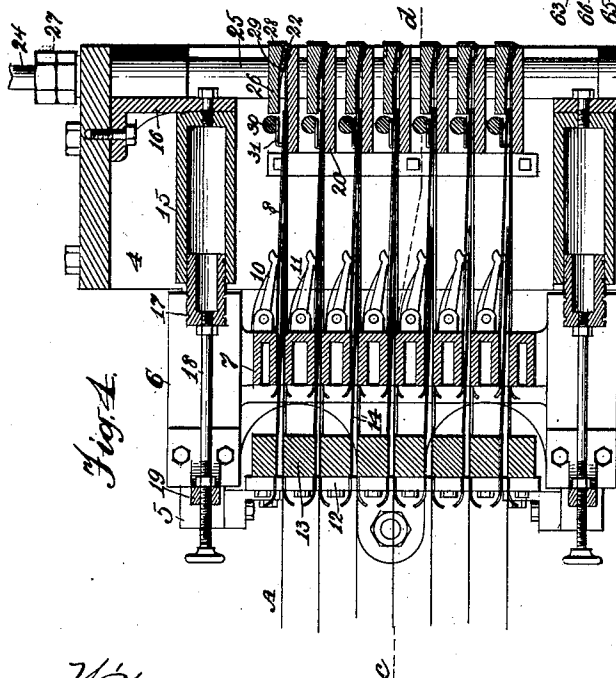
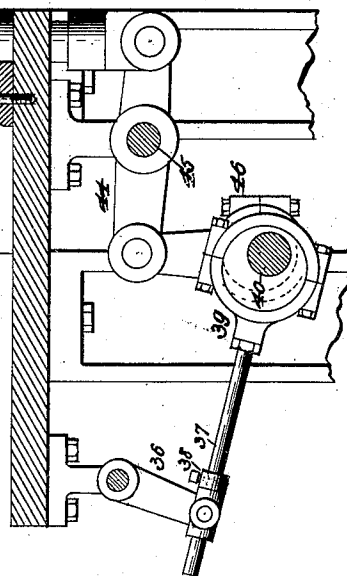


Fig. 7.



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4 SHEETS—SHEET 4.

Fig. 8.

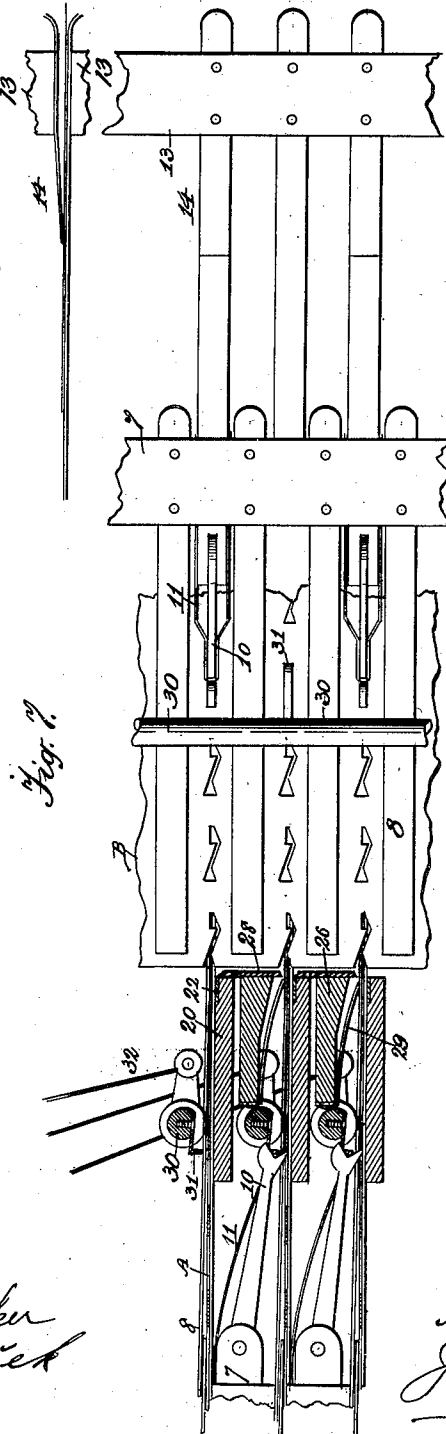


Fig. 7.

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UNITED STATES PATENT OFFICE.

ALWIN W. D. WEIS, OF WATERLOO, AND JOSEPH STARMAN, OF CEDAR RAPIDS, IOWA; SAID
STARMAN ASSIGNOR TO SAID WEIS.

CELL-CASE MACHINE.

No. 880,845.

Specification of Letters Patent.

Patented March 3, 1908.

Application filed March 10, 1906. Serial No. 305,420.

To all whom it may concern:

Be it known that we, ALWIN W. D. WEIS and JOSEPH STARMAN, citizens of the United States, residing at Waterloo, in the county of Blackhawk and State of Iowa, and Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Cell-Case Machines, of which the following is a specification.

This invention relates to machines for making cell case commonly known as "egg-case fillers", and has for its object to produce a machine adapted to automatically assemble the fourteen strips of strawboard commonly used in a commercial cell-case, and to do this rapidly, inexpensively and in a neat and workmanlike manner.

The nature of the invention will be fully hereinafter set forth, reference being had to the drawings forming a part of this specification, in which—

Figure 1 is an end view of the machine which assembles the punched strips to form a cell-case. Fig. 2 is a side view of the same as seen in the line *a b*, looking downwardly. Fig. 3 is a back view of the upper portion of the machine frame shown at the left in Fig. 2, and shows the spring connections of the detents for the punched strawboard, to be fully described later. Fig. 4 is a vertical section central to this frame, showing the sheet-carriers, feed mechanism, etc. Fig. 5 is a section of the same in the line *c d* of Fig. 4, and shows a plan view of the same internal mechanism. Fig. 6 is a fragmentary sectional view of the cutter heads, showing the mounting of the same. Fig. 7 is a fragmentary detail showing on an enlarged scale the assembling mechanism in the act of matching together two sets of cell-case sheets before they are finally cut off. Fig. 8 is a side view of parts just below it in Fig. 7.

The machine is designed to assemble simultaneously, in position to be interlocked by simply pressing together, the notched ends of fourteen previously punched sheets of strawboard, or other suitable cell-case material, and to sever the terminal strip from the parent sheet when so intermatched. The machine also discharges the severed product from between the two assembling heads, and in a subsequent operation, external to this machine, the intermatched strips are pressed completely together and in their final position are interlocked. In the order

of time this operation is preceded by the punching of the sheets which may be presented to the assembler from a series of rolls of punched paper, or otherwise, the mounting of the material for the cell-cases being very simple, and forming no essential feature of this invention.

Referring now to Fig. 1, the numeral 1 denotes a heavy bed-plate or base suitably anchored to give stability to a machine having reciprocating parts and running at quite a high speed. On this base are mounted two sector-shaped frames numbered 2 and 3, respectively, the two members of each frame being somewhat unlike, as will be seen. To the heads of these frames, which incline toward each other at a right angle, are mounted frames 4 4, which contain the sheet carrying and assembling mechanism, to be described hereafter. As seen by reference to Fig. 2, these frames stand at right angles to each other, endwise, and are separated from each other a space somewhat more than the depth of the cell-case as cut off.

The assembling and cut-off mechanism appears in Figs. 4 to 7 inclusive. On guides 5 secured to the frames 4 are mounted cross-heads 6 adapted to move back and forth a distance considerably greater than the width of a cell-case strip. The crossheads are connected by cross-bars 7, separated to allow the perforated sheets A or B to pass between them. To these cross-bars are attached forwardly extending fingers 8 which hold the sheet perfectly true, and in the matching operation hold it close to the extreme forward edge, as will be explained presently. The cross-bars also carry pivoted dogs 10, which aline with perforations in the sheet, and in the forward movement of the cross-head engage with such perforations at their notched forward ends, and so feed the sheet forward to matching position. The dogs are best provided with springs 11, so that their engagement with the perforations does not depend entirely upon gravity.

Back of the crosshead in each frame is a grid formed of vertical bars 12 bracketed to the guides 5, and cross-bars 13, separated to allow the sheets to pass between them. To these cross-bars are also attached guide-fingers 14 alternating with the guide-fingers 8, as shown in Fig. 5. These stationary fingers aline with the feed dogs, and extend forward to points somewhat in advance of the

rearward position of said dogs, as clearly shown, and to points in the forward movement of the dogs when they should engage the perforations in the sheet and commence to feed it forward. The fingers thus serve not only as guides for the sheet, but also as switches or cams to shunt the dogs from the perforations and allow the crosshead to move much farther than it could otherwise do.

This superfluous movement of the crosshead consumes enough time to admit of the use of crank motion to throw it, instead of cams, with the increase of speed implied thereby, and allows for the necessary movements of the machine in performing other operations.

To ease the crossheads at terminal positions dash-pots 15 are suitably secured to the frame, as by brackets 16. In these play plungers 17 attached to stems 18, which are threaded for adjustment in bridges 19 connecting the crossheads outside the paths of the perforated sheets.

Near the inner side of each frame is the cut-off mechanism. Fixed shear-plates 20 have their ends seated in notches 21 in the sides of the frames. To these are secured the lower shear blades 22. At each end of the fixed plate is a hole 23 to allow for the passage of clamp-rods 24 and their inclosing thimbles 25, between which are held the shear-heads 26, being drawn tightly in place by nuts 27. To the thicker inner edge of these plates are attached the shear blades 28, which are made wide enough to overlap the edges of the fixed plates above, and have their upper edges beveled, as shown in Fig. 6. This prevents any part of the cut-off cell case from slipping back between the shear blades, and gives a practically smooth surface each side, between which the cell-case is easily ejected, and without injury. The shear heads 26 are thinned backwardly to give plenty of room for the guide fingers, and are provided with downwardly pressing springs 29 to hold the perforated sheet flat on the lower shear-plate and prevent its edge from springing up to catch on the upper shear-blade.

As above noted, the guide fingers move much farther than the width of the cell strip. The sheet, however, does not move back with the fingers, but is held in the cut-off position, practically, and the fingers strip back over and under it. In fact this movement takes place before the cut-off, inasmuch as the fingers in their forward movement pass bodily between the shear blades, carrying the edges of the sheets with perfect precision to the proper intermatching positions, and of course they must retreat before the cut-off takes place. Means are therefore provided to hold the sheet while the fingers strip back. This device is clearly shown in Fig. 7. Just back of each shear head is a rock-shaft 30, each provided with a number of detent hooks 31 to engage

perforations in the sheet. In practice these detents alternate with the feed dogs, as shown. At each end each shaft is provided with a short crank. To each one of these cranks connects a spring 32 (see also Fig. 3), which tends to draw the detent down to sheet-holding position. The cranks at the other end (see Fig. 2) have each a lateral wrist-pin to engage a notched slide-bar 33. This bar is linked to a lever 34; and this in turn, by an adjustable link 35, to a bell-crank lever 36. (See also Fig. 4.) Pivoted to one arm of this bell-crank is a wrist-block bored transversely to allow a rod to run through it. The rod, 37 has an adjustable collar 38 to abut against the wrist-block, and connects with the strap of an eccentric 39 on a diagonal shaft 40 (see also Fig. 1.) At the lower end this diagonal shaft (one for each half of the machine) engages by miter gears 41 with the main horizontal shaft 42 mounted in bearings 43 on the bed-plate of the machine.

In Fig. 4 the cut-off drive is also shown. The clamp rods 24 are coupled to levers 44 pivoted at 45, and at their opposite ends the levers connect suitably with eccentrics 46 secured to the same diagonal shafts. The use of eccentrics here, as elsewhere in the machine, instead of cams, makes it possible to run the machine at a speed which cams would render impossible.

As above noted, the feed crossheads are driven by rotary and not cam motion. A direct crank movement would involve a much longer stroke than is desirable or practicable at the speed at which the machine runs. This will be evident from the fact that the guide fingers are thrust between the cutting blades and beyond them about two inches, and must be withdrawn before the blades, which open not one fourth that distance, close to cut the sheet. The mechanism by which this operation is effected, with only a moderate stroke of the crosshead, is shown in Fig. 2. Near each end of the diagonal shaft is secured an eccentric 47 connecting by its strap and rod 48 with one wrist 49 of a crank-wheel 50. Nearly opposite this wrist is another, 51, and this connects by an adjustable link 52 with the cross-head. By means of this link the feed may be accurately adjusted with respect to the cut-off, and the depth of intermatching varied at pleasure. The crank wheel moves through about one quarter of a revolution. The driving eccentric being set below the crank wheel, and the latter being horizontal to the cross-head wrist, it will be evident that while the wrists are moving over the portion of the arc indicated by their position in Fig. 2 there is but slight movement of the cross-head. But when nearing or receding from the final forward position, the movement of the crosshead is

rapid, and this is the movement desired, as at this time the fingers are passing under the shear blade. It is possible, by this arrangement, to permit the rear wrist to rock past the center, and by this means any desired amount of time may be consumed without addition to the stroke of the crosshead.

From the foregoing it will be seen that the operations requiring the movement of heavy parts, the cut-off and feed, are effected by simple rotary motion converted into reciprocating motion. The hold-back, or detent, above described, is, however, intermittent in its action. As described, the detents spring down to holding position. The releasing movement is made by the push of the slip-rod, the collar 38 being adjusted to the exact instant in the cycle of movements, and the release, as well as the engagement, being almost instantaneous. At all other times the proper action of the mold-back is not affected by the general movement of the machine. The grip of the holdbacks takes effect just as the sheet completes its feed, and should continue until the paper begins to feed forward, or very shortly before that action.

The final operation of the assembling machine is to eject the intermatched cell-case. In Figs. 1 and 2 is shown the mechanism for this purpose. Pivoted at 53 is a sweep 54 adapted to play between the assembling heads and in the path of the matched cell-case. A crank arm 55 connects by a rod 56 with a crank arm 57 on a rock shaft 58 turning in standards 59. Another crank 60 takes the motion of an eccentric 61 attached to the main shaft, through a connecting rod 62. The mechanism is timed to give a quick stroke and return just after the cut-off, it having the time of a part of both the forward and the back stroke of the feed, or nearly so, in which to do its work.

In Figs. 5 and 6 are shown the mountings of the shear heads 26. It will be seen that these are not guided by the rods 24 running through holes or thimbles in the fixed shear-plates, a construction that is uncertain and short-lived in machines of this class. The holes in the fixed shear plates are bored somewhat larger than the thimbles playing through them, so as to allow for a little adjustment of the rods. The narrowed ends of the movable shear-plates are reinforced by wear-blocks 63, and these ends slide up and down in grooves 64 planed in the sides of the frame 4. To take up lost motion, as the parts wear, a hardened gib 65 is provided, adjustable by set-screws 66. This take-up also brings the shear blades into closer cutting position. The considerable weight of the shear-plates and connected moving parts is compensated for by a strong spring 67 under a yoke 68 secured to the upper ends of the clamp-rods.

It is necessary at times to move the halves of the machine away from each other, so as to get access to the assembling mechanism from the inner end. For this purpose the main frames are mounted to slide between guides 69 on the bed-plate. To each frame is attached a rack 70, and near each end of the bed-plate is a pinion 71 to engage the rack, secured to a shaft 72 in bearings 73. On the same shaft is a spanner wheel 74, and below the rack a guide roller 75. The machines are easily slid back and forth by means of a spanner-rod 76.

It is to be noted that in this type of machine there can at no time be much variation from register in cutting off the matched strips, inasmuch as the feed for cut off is dependent upon the punching, and there can be no progressive lengthening or shortening of feed to bring the cut-off more and more out of register with the punching. The practical effect is found in clean and accurate work, while the unusual speed of its action, to which reference has been made, renders it highly productive and satisfactory.

In the drawings the nature of the paper used is clearly indicated by a fragment shown in Fig. 7. This is supposed to be part of a web of previously punched paper, the mounting of which forms no part of this invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is:

1. In a cell-case machine provided with suitable actuating mechanism, and having sheet grouping frames separated a short distance from each other, and inclined substantially at right angles to each other, the combination of sheet-holding fingers, feed-dogs to engage perforations previously made in the sheets, shears to sever the strips when intermatched, and mechanism adapted to move said fingers forward and back between the shear-blades to guide the sheets in matching, substantially as set forth.

2. In a cell-case machine having sheet-grouping, guiding and feeding mechanisms in a separated pair and at substantially right angles to each other, fingers to hold and guide the matching edges of the sheets, a positive feed mechanism to engage the previously punched sheet, a suitable cut-off to sever the sheets after matching between the two parts of the machine, and mechanism adapted to actuate the feed, to carry the fingers and the sheet held by them to matching position between the shears.

3. In a cell-case machine arranged to deliver notched sheets in a pair of groups substantially at right angles to each other, the combination of fingers to hold and guide the sheets, feed-dogs to positively feed the sheets forward, means for moving the fingers and dogs simultaneously a greater distance than

the limited movement of the sheet, a back-stop for the sheet, and a shunt for the feed through a part of its course.

4. In a cell-case machine, the combination of a matcher or assembler comprising a pair of mechanisms arranged to deliver into an open space between them, and at substantially right angles to each other, groups of notched sheets to form a complete cell-case, means for feeding the sheets to intermatching position, means for severing them when so matched, an ejector to discharge them from the open intermatching space.

5. In a cell-case machine arranged to match at substantially right angles the slotted but unsevered sheet ends to form a complete cell-case, the combination of guiding fingers to hold the sheets in proper position, cooperating feed-dogs, means for simultaneously moving the fingers and dogs through a greater space than the required feed, and auxiliary stationary fingers adapted to shunt the dogs during a part of their course.

6. In a cell-case machine arranged to deliver and match slotted sheets in an open interspace in groups substantially at right angles to each other, the combination of cut-off mechanism substantially as described, a cross-head moving back and forth at right angles to the movement of the cut-off, sheet-holding and guiding fingers attached to said crosshead and adapted in its forward movement to pass between the blades of the cut-off, sheet-feeding dogs pivotally connected with the crosshead, and means for reciprocating said crosshead.

7. In a cell-case machine arranged to deliver and match slotted sheets in an open interspace in groups substantially at right angles to each other, the combination of cut-off mechanism, a crosshead provided with guiding and holding fingers adapted in the forward movement of the crosshead to pass between the cut-off blades, sheet-feeding dogs, means for reciprocating the crosshead, and means for cushioning it at the ends of its stroke.

8. In a cell-case machine, the combination of cut-off mechanism, guide fingers and feed-dogs, a crosshead to which said guide fingers and feed dogs are attached, guides for said crosshead at right angles to the movement of the cut-off, a crank connection with said crosshead means for moving the crank through about ninety degrees of arc from the point of extreme possible backward movement, whereby the fingers move most rapidly near the extreme forward position, substantially as and for the purpose set forth.

9. In a cell-case machine having cut-off mechanism, substantially as described, a reciprocating crosshead moving transverse to the cut-off, and provided with sheet-feeding dogs and sheet-guiding fingers which in their

forward movement pass between the blades of the cut-off, driving mechanism for the crosshead comprising a crank oscillating from an extreme possible backward position through about ninety degrees of arc, a rotating crank and a connection between said oscillating crank and rotating crank.

10. In a cell-case machine having sheet-guiding and feeding mechanism, a rotating crank adapted to impart uninterrupted reciprocating movement thereto, a hold-back to engage the sheet and means for bringing the holdback into such engagement during the entire movement of the feeding-mechanism, except while feeding the sheet forward.

11. In a cell-case machine, substantially as described, a hold-back, comprising a rack-shaft, dogs attached thereto to grip the sheet, a crank and a spring connection therewith to hold the dogs in gripping position, another, oppositely disposed crank, an eccentric, a slip-rod and actuating mechanism communicating with the latter crank, whereby the eccentric is made to act on the rock-shaft through only a part of its revolution, as specified.

12. In a cell-case machine, the combination of a grid-like crosshead provided with guide-fingers and feed-dogs, means for reciprocating the crosshead, a grid back of the crosshead, with fingers extending between its bars and interspaced between the movable fingers, and adapted to shunt the feed-dogs out of engagement with the sheet during a part of their movement.

13. In a cell-case machine having a gang of stationary shear-plates, and in combination therewith, a gang of movable shear-plates and blades attached thereto, the upper portions of said blades being extended to overlap the fixed plates, as described.

14. In a cell-case machine, the combination of a gang of fixed shear-plates, a retaining frame therefor with guiding grooves for moving shear-plates, a gang of movable shear-plates, with reinforced ends running in said grooves, adjusting gibs, rods, thimbles and compression nuts to hold the movable plates, and a connection thereof with actuating mechanism, the rods and thimbles passing through holes in the fixed plates a little larger than the thimbles.

15. In a cell-case machine, the combination of a gang of fixed shear-plates, a retaining frame therefor with guiding grooves movable shear-plates running in said grooves, parallel rods running through holes in the fixed and movable plates, thimbles and compression nuts to hold the fixed plates in position, a yoke connecting the rods, a counter-balance spring, end-extensions running in said grooves, and adjusting gibs, substantially as described.

16. In a cell-case machine, the combination of cut-off mechanism, a feed crosshead and connected mechanism moving transversely to the cut-off, a crank-wheel and
5 rock-shaft, mechanism to oscillate said rock-shaft, and adjustable links connecting the crank with said crosshead, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

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