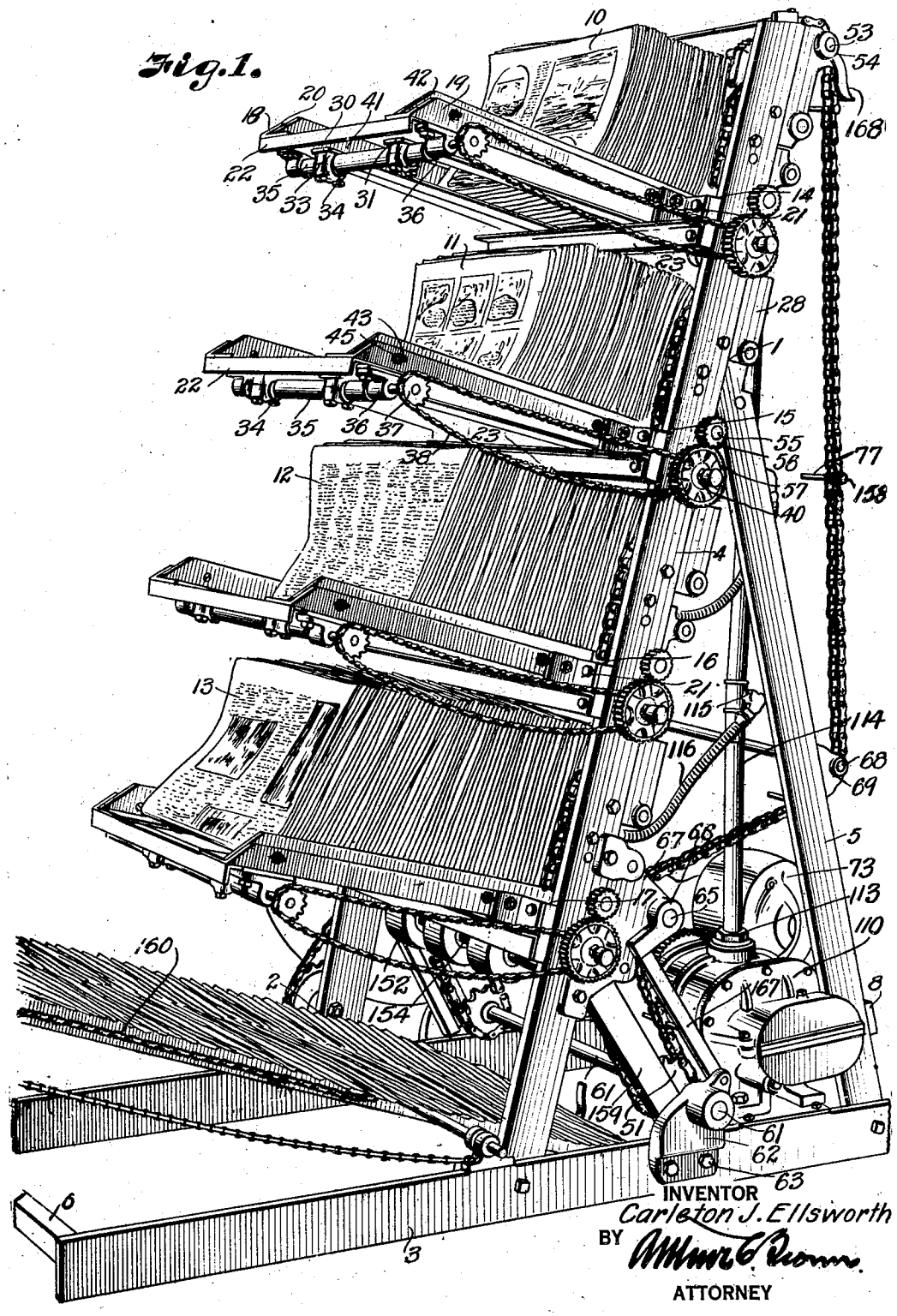
June 24, 1930. C. J. ELLSWORTH 1,766,117

PAPER STUFFING MACHINE

Filed Feb. 20, 1928 7 Sheets-Sheet 1

Fig. 1.



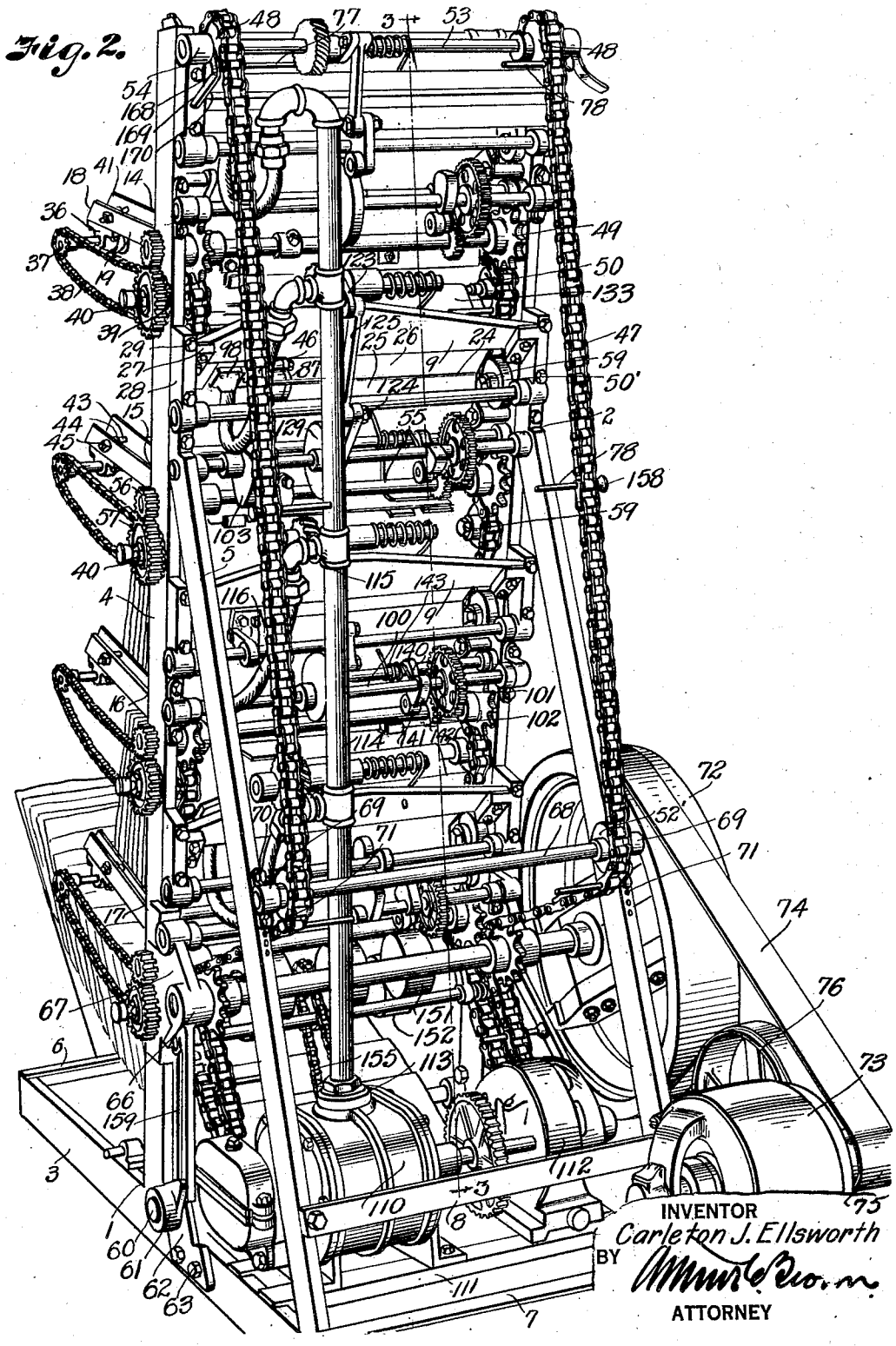

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PAPER STUFFING MACHINE

Filed Feb. 20, 1928 7 Sheets-Sheet 2

Fig. 2.

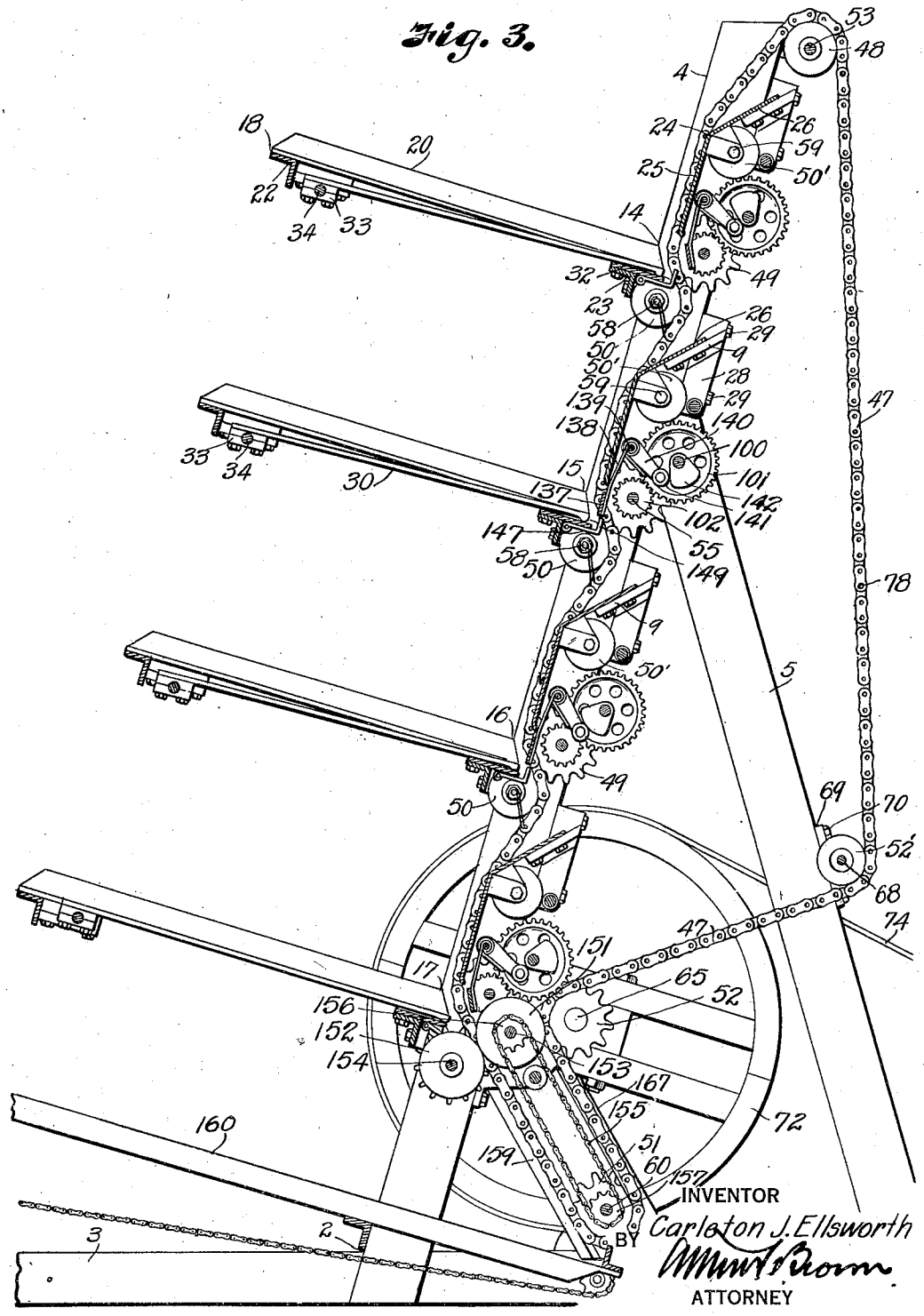


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PAPER STUFFING MACHINE

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Fig. 3.



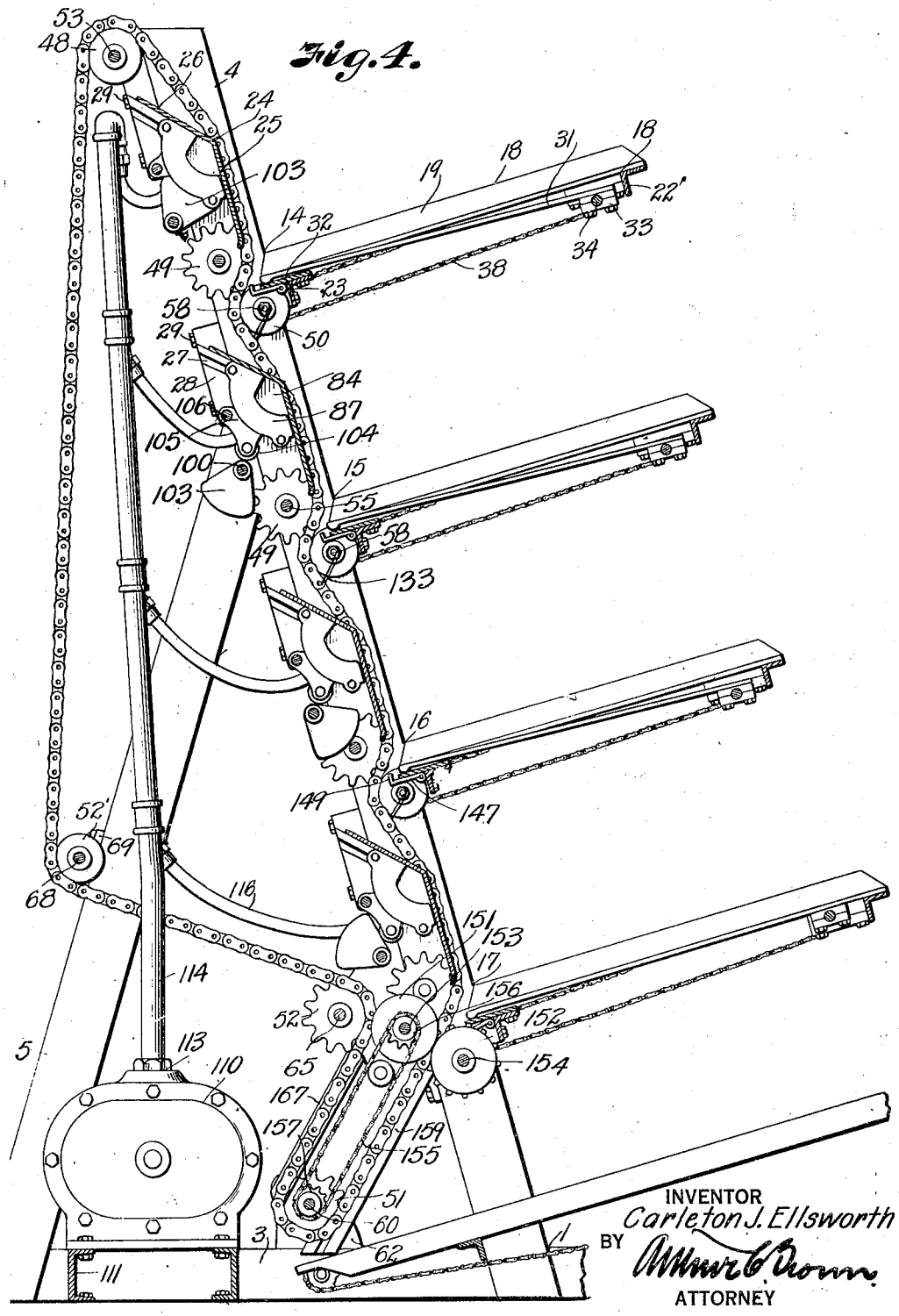

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PAPER STUFFING MACHINE

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Fig. 4.




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PAPER STUFFING MACHINE

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Fig. 5.

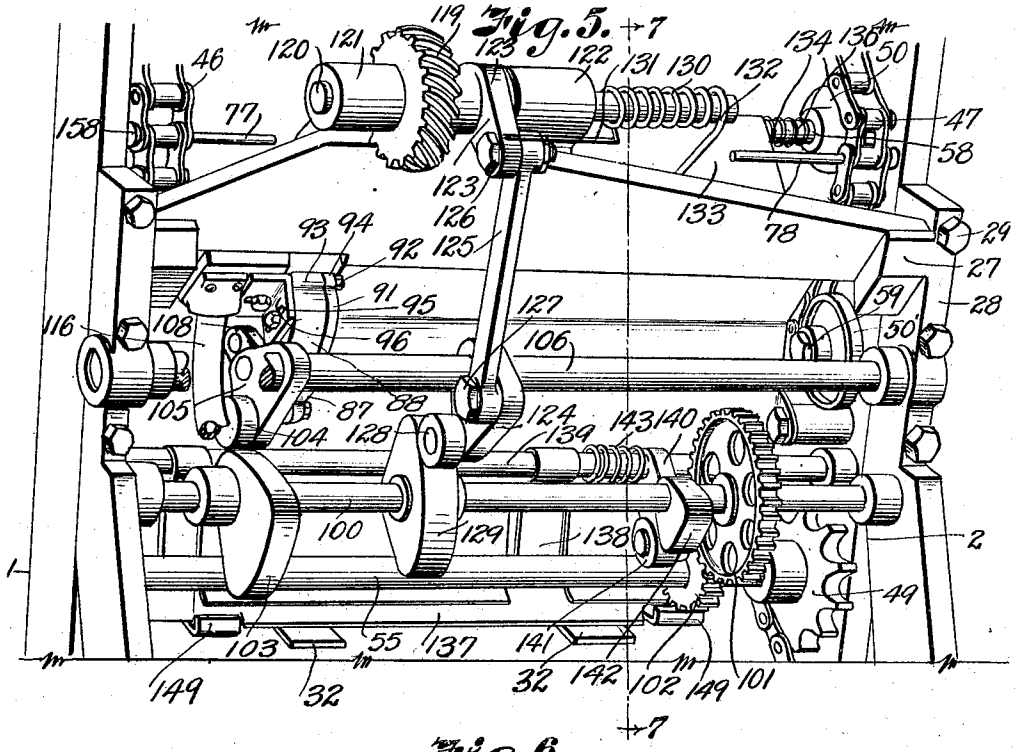
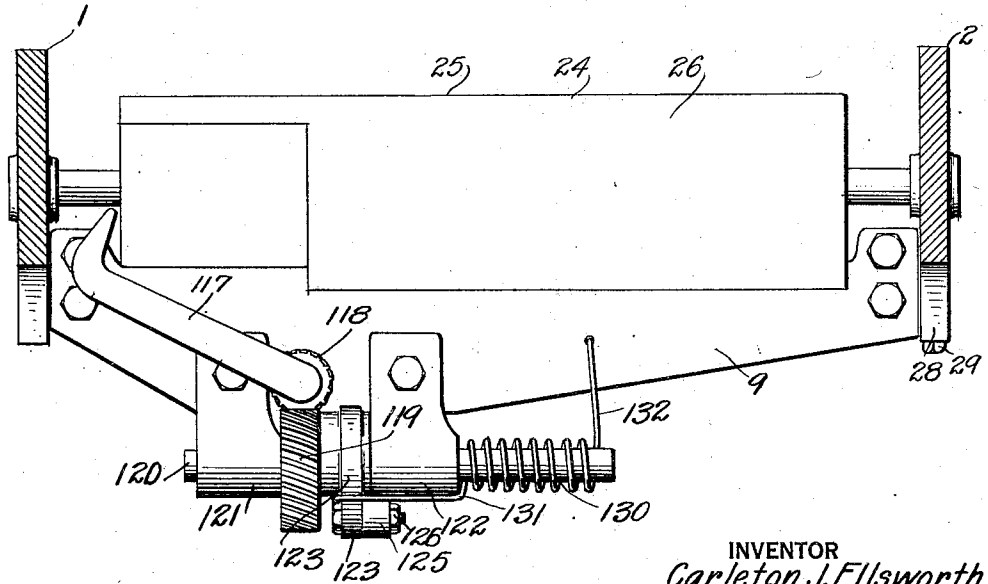



Fig. 6.




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PAPER STUFFING MACHINE

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Fig. 7.

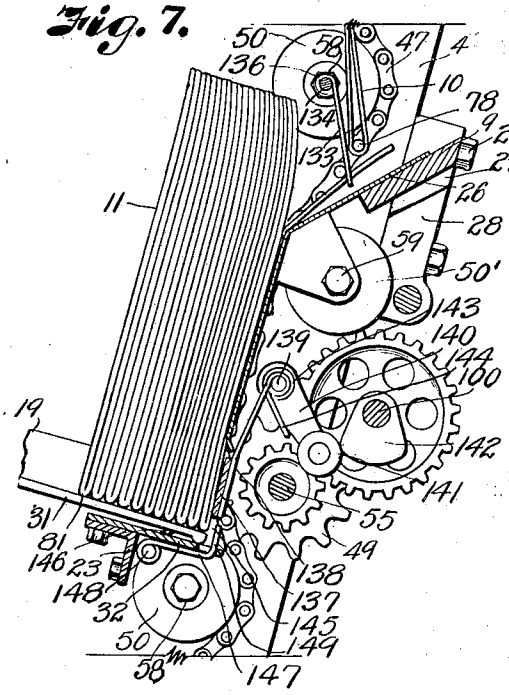



Fig. 9.

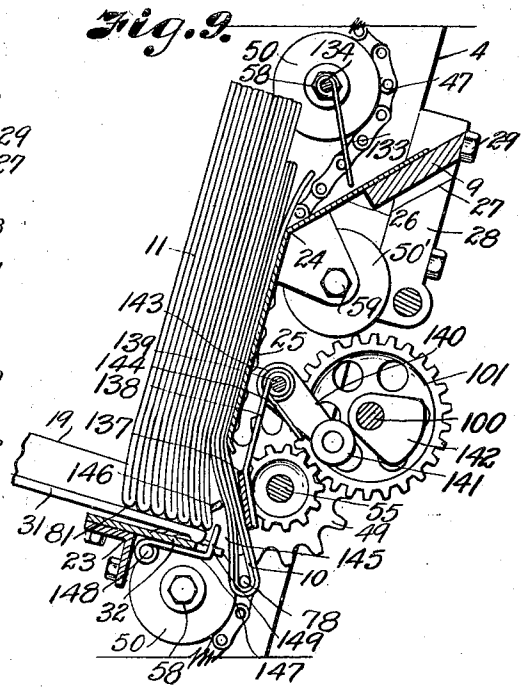



Fig. 8.

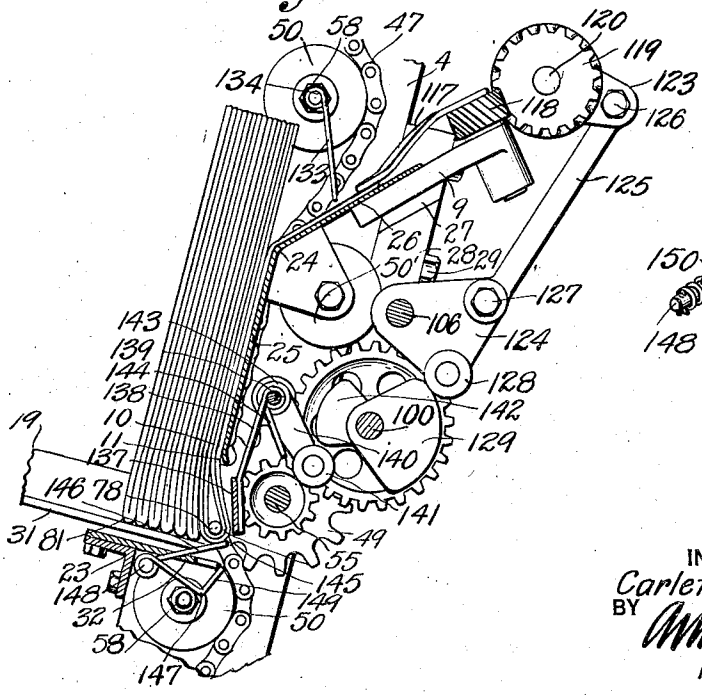
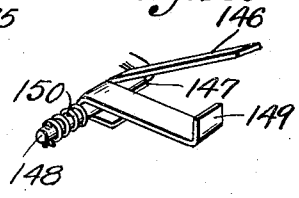



Fig. 15.




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PAPER STUFFING MACHINE

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Fig. 10.

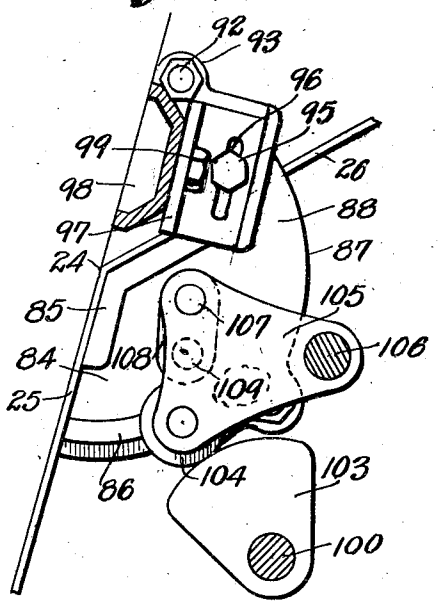



Fig. 11.

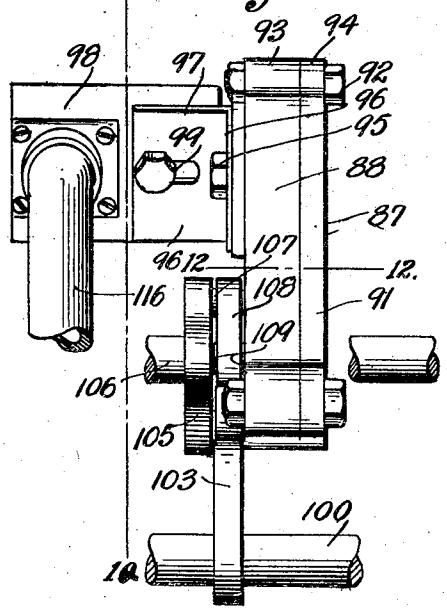



Fig. 12.

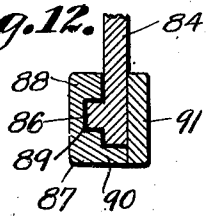



Fig. 13.

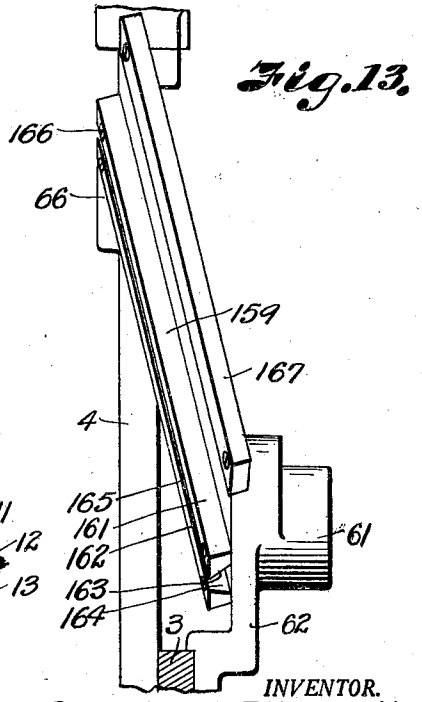
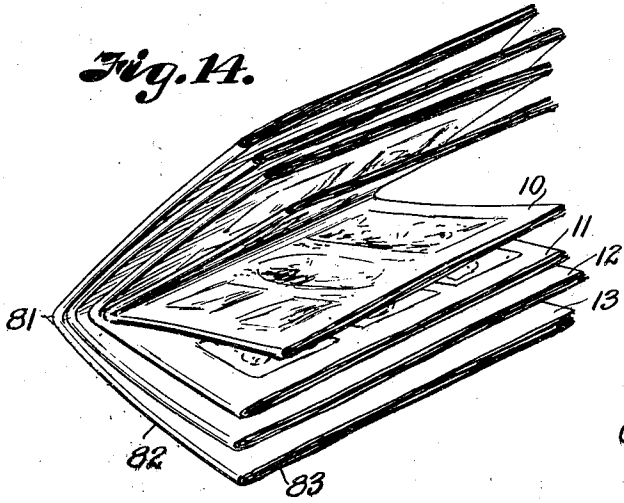



Fig. 14.




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# UNITED STATES PATENT OFFICE

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## PAPER-STUFFING MACHINE

Application filed February 20, 1928. Serial No. 255,656.

My invention relates to signature assembling machines, and more particularly to a machine of that character for assembling the component sections of newspapers, the principal object of the machine being to provide for automatically nesting of the sections one within the other to form a completed newspaper.

In accomplishing this and other objects of the invention I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a machine constructed in accordance with my invention, and adapted for the assembly of a four-section newspaper.

Fig. 2 is a perspective view of the rear of the machine, particularly illustrating the actuating mechanism.

Fig. 3 is a vertical longitudinal sectional view through the machine taken on the line 3—3 of Fig. 2.

Fig. 4 is a similar vertical longitudinal sectional view through the machine viewed from the opposite direction from that of Fig. 3.

Fig. 5 is a detail perspective view of the rear of one of the head sections of the machine, particularly illustrating the paper controlling mechanism.

Fig. 6 is a sectional plan view of the mechanism shown in Fig. 5.

Fig. 7 is a vertical sectional view on the line 7—7, Fig. 5, illustrating the method of bringing a paper section from the upper head into the opened section contained in the head illustrated in Fig. 5.

Fig. 8 is a similar sectional view showing the section brought from the head above completely nested, and the nested sections ready to be moved into the next lower head.

Fig. 9 is a similar view showing the nested sections being removed from the head and carried into the next lower head.

Fig. 10 is a sectional view through a suction cup of one of the heads, and its actuating mechanism taken on the line 10—10, Fig. 11.

Fig. 11 is a rear elevational view of a suction cup and its actuating mechanism.

Fig. 12 is a sectional view through the suction cup carriage and its guide taken on the line 12—12, Fig. 11.

Fig. 13 is a rear elevational view of the conveyor pin controlling guides.

Fig. 14 is a perspective view of a newspaper comprising four sections, assembled with my improved apparatus.

Fig. 15 is a perspective view of a paper-detaining latch member.

Referring more in detail to the drawings:

1 and 2 designate respectively the right and left side frames of the machine, each comprising a base member 3, an upright member 4 mounted substantially midway of the base member, and a brace member 5 connecting the base member 3 with the upright member 2; the side frames being spaced apart to provide a support for a plurality of paper section supporting heads, and tied together by angle bars 6 and 7 connecting the adjacent opposite ends of the base members, a bar 8 connecting the brace members, and a plurality of spacing bars 9 extending horizontally between the uprights in spaced alignment with the heads.

There may be any number of heads in the machine, but I prefer to provide a head for each section of a complete newspaper, so that the complete paper may be assembled with one run of the machine. The machine here illustrated consists of four heads and is adapted for assembling a four-section newspaper, which may consist of a gravure section 10, a comic section 11, an editorial section 12 and a news section 13 (Fig. 14).

In newspaper printing the gravure, comic, and editorial sections are usually prepared in advance of the news section, leaving the

news section to be run a few hours before the time for publication. Consequently the various sections cannot be assembled into a newspaper until after the news section has been printed, and it has become quite a problem for newspapers to assemble the various sections in the short interval between the printing of the news section and the time for delivery of the editions.

These sections are usually assembled, or in newspaper language, "stuffed", by hand, which, where there is a large circulation, offers a serious labor problem, as well as necessitating an extremely large floor area for the workers.

As before stated, it is the object of this invention to "stuff" or nest the various sections automatically; thus accomplishing the result with a small battery of machines on a comparatively small floor space, and without the mistakes incidental to hand stuffing.

In the machine as illustrated, the gravure section 10 may be placed in the top head 14, the comic section in the next lower head 15, the editorial section in the next head 16, and the news section in the lower head 17, so that the gravure and comic sections, which are usually the thinnest and more fragile, are nested within the heavier editorial and news sections to provide protection for the light fragile sections.

As the heads 14 to 17 inclusive are preferably of the same mechanical construction, description of one will suffice for the remainder.

Each head includes a rack 18 for supporting the newspaper sections to be fed into the machine, and each rack comprises spaced angle bars 19 and 20 extending laterally from the side frames 1 and 2 respectively, and are secured thereto by angle plates 21, one leg of each of which is bolted to a side frame and the other leg to an angle bar 19 or 20. The angle bars 19 and 20 are so positioned that one of the angle legs extends upwardly and the other horizontally, so that the horizontal legs are connected at their front and rear ends by angle irons 22 and 23 to provide a frame-work for supporting the paper sections and a feed mechanism hereinafter described.

Extending between the side frames 1 and 2 and spaced slightly above the rack sections are abutment plates 24, each comprising a section 25 extending parallel with and inset from the forward face of the side frame, and an angularly inclined projecting section 26 supported by the cross bars 9, as clearly shown in Figs. 3 and 4, the cross bars 9 being also inclined angularly and bolted to lugs 27 extending laterally from the inner faces of bearing blocks 28 bolted to the rear face of the side frame by bolts 29.

In order to provide a gravity feed for the paper sections toward the abutments 24, I prefer to incline the upright members of the side frame at an angle of approximately fifteen degrees with the vertical, so that the rack sections are inclined downwardly toward the abutment plates.

The rack sections, as before mentioned, are each provided with a paper feeding mechanism comprising spaced slats 30 and 31 having their rear ends resting slidably upon plates 32 (Figs. 3 and 4) bolted to the angles 23 and extending rearwardly thereof to substantial alignment with the abutment plates. The opposite ends of the slats are provided with bearing blocks 33 journalled upon the cranks 34 of a crank shaft 35, which extends across the rack at its forward ends, and rotatably mounted in bearings 36 secured to the angles 19 and 20 respectively. Therefore, as the crank shaft 35 rotates, the forward ends of the slats will reciprocate upon the plates 32, and the rear ends of the slats will oscillate in an up-and-down movement, which tends to feed and joggle the paper sections along the racks into engagement with the abutment plates as the papers are fed therefrom, as later described. The crank shafts 35 are provided with sprockets 37 (Figs. 1 and 2) driven by a chain 38, operating over a sprocket 39 on a stub shaft 40, hereinafter described.

In practice the various sections composing a newspaper are of different widths, and in order to equip the racks so that they will receive any size newspaper section, I provide the racks with adjustable side bars 41 and 42 extending parallel with the angle bars 19 and 20 and adjustable laterally therewith by adjusting bolts 43 carried by the adjusting bars, and which project through the vertical leg of the angle bars 19 and 20, and are engaged therewith by nuts 44 and 45, so that the nuts 44 and 45 may be manipulated on the bolts to adjust the bars laterally to provide the proper spacing therebetween for the paper sections.

I will now describe the mechanism whereby a paper section from the top head is withdrawn from the stack and nested within another section of the paper carried in the next lower rack, and whereby the two sections thus nested are carried into the next lower head, and so on, to nest all of the sections of the newspaper and deliver the completed newspaper onto and off-take conveyor ready for circulation.

The feed of the sections is accomplished by conveyor chains 46 and 47 running over idling pulleys 48 at the top end of the side frame, sprockets 49 located in alignment with each rack section, idler pulleys 50 located below the sprockets 49, idler pulleys 50′ mounted below the pulleys 50, sprockets

51 carried by the base members of the side frame, drive sprockets 52 mounted above the sprocket 51 and idler pulleys 52′ carried by the brace members 5 of the side frame, so as to provide an endless chain conveyor running downwardly along the side frames in alignment with the members 24 of the abutment plates, and then upwardly to the top of the side frames and back over the pulleys 48 providing an endless conveyor running through the machine. The pulleys 48 are rotatably mounted upon a counter shaft 53 carried in bearings 54 formed on the upper bearing blocks 28, and the sprockets 49 are keyed adjacent the inner faces of the side frames upon counter shafts 55 rotatably mounted in the uprights 4 of the side frames, the shaft projecting through the side frame to carry a pinion 56 meshing with a gear 57 in driving connection with the sprocket wheel 39 on a stub shaft 40 for driving the chains 38, which rotate the crank shafts 34 to operate the slats 30 and 31. The pulleys 50 are mounted upon stub shafts 58 carried by the side frames, and the pulleys 50′ are mounted on stud bolts 59 in alignment with the face of the abutment plates, the pitch line of the sprocket wheels 49 being such as to allow the pitch line of the chain to coincide with the faces of the abutment plates, so that the chain is carried downwardly in alignment with the abutment plates and is carried, due to the idler pulleys 50, slightly around the sprockets 49, so that the chain moves rearwardly adjacent the lower ends of the abutment plates and the rear ends of the section feed slats for a purpose hereinafter described.

The sprockets 51 are keyed to a countershaft 60 rotatably mounted in bearings 61 on bracket arms 62 secured to the base members 3 of the side frames by bolts 63. The drive sprockets 52 for the chains are keyed to a drive shaft 65 extending between the frame members and rotatably mounted in bearings 66 on the bracket plates 67 secured to the uprights 4 and 5 of the side frames, rearwardly of the sprockets 49 of the lower head 17. The idler pulleys 52 constitute an adjustment for tensioning the chains and are carried upon a shaft 68 mounted in bearings 69 that are adjustably bolted to the brace members 5 by bolts 70, which may be inserted in any pair of a plurality of threaded apertures 71 provided in the brace members. The drive shaft 65 projects laterally of the side frame 2 and carries a fly wheel pulley 72 driven from a motor 73 through a belt 74 running over the pulley 72, and a pulley 75 on the motor shaft, the belt being tensioned by a belt tightener 76 mounted upon the base member of the side frame.

The conveyor chains 46 and 47 are provided at spaced intervals with inwardly projecting carrier pins 77 and 78 slidably retractable and projectible through certain of the chain link connections, and on which the chain links may pivot, the pins projecting inwardly and facing each other in parallel alignment to pick up the paper sections by engaging the fold between the leaves and move the sections successively and downwardly through the machine, as now described.

Newspapers are usually folded in halves and the papers are stacked in their rack on edge with the folded edge 81 resting on the rack, and in order to permit the pins to enter between the folds of the gravure section carried in the top head it is necessary to open the folds, which is accomplished by spreading the leaves of the fold engaging the abutment plate rearwardly upon the angular section 26 of the abutment plate and to retain the opposite flap against the remainder of the papers in the rack, so as to provide a wide opening between the halves of the paper and permit the entrance of the pins. It is desirable to start the opening of the paper at the side fold 82 of the leaves composing a section, so that all of the leaves will be opened, and I accomplish this by providing a vacuum cup adapted to engage the section as close to the fold 82 and to the upper edge 83 as possible. The opening mechanism includes an arcuate casting 84 provided with a lateral flange 85 complementary to the angle formed by the sections of the abutment plate, the arcuate casting being also provided with an arcuate rib 86 projecting laterally of its face to provide a track or rail for a vacuum cup carriage 87.

The carriage 87, best illustrated in Figs. 10, 11 and 12, comprises an arcuate channel shaped casting 88 having an arcuate groove 89 for receiving the arcuate flange 86 on the casting 84, and a peripheral laterally extending flange 90 for engaging the arcuate edge of the casting 84, the casting 88 being retained upon and in engagement with the casting 84 by an arcuate plate 91 bolted to the casting 88 by bolts 92 extending through ears 93 and 94 in the respective members, so that the carriage is retained on its arcuate track and may be moved thereon by a cam and lever mechanism hereinafter described.

Adjustably mounted by a bolt and slot connection 95 on the side face of the casting 88, is an angle plate 96 having a laterally projecting leg 97 for mounting a vacuum cup 98 adapted for engagement with the paper section upon movement of the carriage upon its track, the vacuum cup being adjustable laterally by a bolt and slot connection 99 similar to the connection 95, so that the cup 98 may be adjusted vertically and horizontally in relation with the corner of the paper section to be opened, it being desirable to adjust the cup so that it en-

gages a paper section at its extreme corner or close to the fold 82, so that the vacuum cup gripping the outside sheet will cause it to move the other sheets without buckling away from the other sheets; thus the sheets are all pulled back smoothly. The carriage 87 is actuated from a cam shaft 100 rotatably mounted in the side frames and driven by a gear wheel 101 from a pinion wheel 102 keyed to the counter-shaft 55. On the cam shaft 100 is a sector shaped cam 103 for engaging a cam roller 104 carried upon a triangular shaped lever 105 loosely mounted upon a rocker shaft 106, also carried between the side frames. The lever 105 carries a pin 107 projecting laterally from its face adjacent to the carriage 87, and is connected by a link 108 connecting the pin 107 with a pin 109 projecting from the face of the carriage 87, so that as the cam shaft rocks the lever 105 upwardly the carriage is moved on its track, due to the pin and link connection, to engagement with the paper section. As the cam moves out of engagement with the lever the vacuum cup moves back into normal position below the angle section of the abutment plate and carries the flap of the paper section with it, due to a vacuum created by a pump 110 mounted upon spaced cross sills 111 connecting the base members of the side frames, the vacuum pump being driven by a motor 112 also mounted on the cross sills in alignment with the drive shaft of the pump. Connected to the inlet 113 of the vacuum pump is a manifold pipe 114 extending upwardly therefrom adjacent the rear of the heads 14 to 17 inclusive, and is provided with branch pipes 115 adjacent each head, so that the vacuum cup may be connected by a flexible hose connection 116 with the manifold pipe 114.

Since the vacuum cup opens only one corner of the paper it is necessary to provide a mechanism for spreading the paper open entirely across its length. To accomplish this I provide a pivoted sickle shaped arm adapted to sweep over the opened corner of the paper and spread the remainder of the sheets downwardly against the inclined portion of the abutment plates. This arm designated 117 (Figs. 6 and 8) is mounted upon a helical gear 118 rotatably mounted upon the bar 9 rearwardly of the abutment plate, the gear being driven to move the arm 117 in an arcuate path by a helical pinion 119 keyed to a stub shaft 120 rotatably carried in bearings 121 and 122 bolted to and projecting rearwardly of the plate 9, the shaft being rocked by an arm 123 projecting laterally of the shaft adjacent the gear 119 and actuated by a triangular shaped lever 124 complementary to the lever 105 through a connecting link 125, the connecting link being pivotally connected to the free end of the arm by a bolt 126 and to the triangular shaped lever by a bolt 127. The lever 124 is provided with a cam roller 128, which engages a cam 129 mounted on the cam shaft 100 complementary to the cam 103, so that when the cam engages the roller to actuate the lever 124 the arm 123, through the link 125, is rocked to rock the shaft 120 and cause the gear 119 to rotate the gear 118 and move the arm 117. As soon as the cam 129 leaves the roller 128, a spring 130 which is coiled about the shaft 120, and which was tightened upon the movement of the arm 117, furnishes motive power to rotate the gear 119 in the opposite direction, moving the gear 118 and swinging the arm 117 back to normal position out of the way of movement of the vacuum cup 98 upon its next operation, the spring 130 having one end 131 bearing against the top of the arm 123 and the other end 132 bearing against the bar 9. While the arm 117 is opening the paper the carrier pins 77 and 78 move into engagement with hinged plates 133, (Figs. 5 and 7) located adjacent the side frames, and in their downward movement move the plates against the stacks of papers holding the tops of the stacks from drooping over and interfering with the travel of the pins.

The plates 133 are hinged on extensions 134 of the stub shafts 58, which mount the idle pulleys 50. Each plate is normally held away from the papers by a spring 136 (Fig. 5) coiled about the shaft, one end of which engages the plate and the opposite end the shaft, so that the plate may be moved into engagement by the pins and returned by the spring. The pins move downwardly within the fold of the paper, the pressure of the stack being relieved by a horizontal bar 137 carried by arms 138 pivotally supported on a cross rod 139 which extends between the side members back of the abutment plates. The cross bar engages the papers below the abutment plate and is urged into engagement with the papers by an arm 140 fixed to the rod 139 and carrying a cam roller 141 engaged by a cam 142 on the cam shaft 100, the cam 142 being so located on the shaft that the bar 137 is swung inwardly at about the time the pins come into alignment with the parallel portion of the abutment plate. As the pins near the fold 81 the cam 142 moves off the roller 141 and the bar 137 is permitted to move rearwardly away from the papers under influence of a spring 143 coiled about the rod 139, and having one end 144 engaging the arm 140 and its opposite end engaging the rod, (Figs. 7, 8 and 9).

At the time the pusher bar 137 moves away from engagement with the papers the pins 77 and 78 reach the sprocket wheels 49 and are carried in an arcuate path outwardly and downwardly thereby and away from the

stack to move the folded edge 81 of the paper now carried by the pins therewith beneath the abutment plate and through the opening 145 normally closed by the bar 137. At about this time the pins engage a projecting arm 146 (Figs. 8 and 15) on a latch member 147 pivotally mounted on a stud 148 carried by the angle 23. The latch 146 is provided with an upwardly extending tooth 149, which normally engages the fold 81 of the rearmost paper of the stack to prevent accidental displacement of the paper from the rack 13, through the opening 144, or to prevent the paper being removed from dragging the adjacent paper therewith when it is being removed from the head. The tooth is adapted to be moved away when the pin contacts the arm 146, which causes the tooth to move downwardly and allow the paper to be moved off its support under influence of the carrier pins. As soon as the pin drops off the arm 146 of the latch member, a spring 150 coiled about the stud 148 swings the latch back into normal position, so that its tooth engages the next paper in the stack and prevents it from being removed with the paper now carried by the pins. The pins carry the paper down to the next lower head where the gravure section is nested in the comic section, the comic section being opened to receive the gravure section in the same manner as the gravure section. The pins in their further movement pick up the comic section therewith and carry the two sections on downwardly into the next head where the editorial section is picked up by the pins and moved on downward to engage the news section, the various sections being all acted upon in the same manner as the gravure section.

The complete paper is now carried downwardly through the lower head between pairs of rollers 151 and 152 mounted upon parallel counter-shafts 153 and 154 carried in side frames. The rollers 151 are driven from the shaft 60 by a chain 155 operating over a sprocket 156 on the roller shaft 153 and a sprocket 157 on the shaft 60 at a speed greater than the travel of the conveyor chains, so that the paper when picked up by the rollers 151 and 152 travels at a greater speed than the chain; thus the folds 81 of the paper are disengaged from relation with the pins. At the same time heads 158 on the pins engage dove-tailed slotted guides 159 (Figs. 2 and 13) in alignment with the travel of the chains between the lower sprocket 49 and the sprocket 51, the guide being inclined outwardly and downwardly, so that the head being engaged in the dove-tailed slot causes the pins to be pulled outwardly through the chains out of engagement with the paper, the paper dropping upon an offtake conveyor 160 extending forwardly of the machine at an angle between the side frames for carrying the assembled papers from the machine.

The conveyor 158 may be of any preferred construction, but is here shown as of the chain belt type, as any desired means may be used to remove the papers as they are assembled.

The guides 159 comprise spaced parallel bars 161 and 162 having outwardly inclined adjacent faces 163 and 164 to provide the dove-tailed slot 165, the bars being supported by the bracket members 67 and the bracket member 62, and are secured thereto by screws 166. The pins are projecting from the outer sides of the chain, as they are carried around the sprocket 51 and they engage a guide bar 167 extending parallel with the guide bars 159, and facing the chain, so that the bar engages the head of the pins and projects them back through the chain where they will be in position to again engage the paper sections upon their next downward movement through the machine.

In order to insure that the pins are in functional position when they reach the rollers 48 I provide guide members 168 (Fig. 2) attached to the top bearing blocks 28 to project through the chain any of the pins that may be extending outwardly thereof, the members comprising a strap 169 having downwardly and outwardly projecting cam ends 170 to engage the heads of the pins, (Fig. 2).

In operating a machine constructed as described, the racks are filled with the folded sections composing a newspaper with the sections inserted in the racks in the order they are to be nested, that is, with the innermost section of the paper in the top rack, the next section in the next lower rack, and so on, the outer section being placed in the lower rack.

The machine is then started to actuate the chains 46 and 47 carrying the pins 78 and 79 in their cycle across the racks. The vacuum cup 98 of the top head is moved into engagement with the corner of the paper in the top rack, and due to the suction from the vacuum pump 110, the corner of the paper is carried with the vacuum cup on its return against the angle section 26 of the abutment plate, the cup being moved into position by the cam 103 and returned by gravity when the cam leaves the roller 104. At this time the arm 117 swings across the folded back corner to spread the remainder of the flap against the angular portion of the abutment plate. A set of pins on the conveyor chains are now in position for engaging the plates 133 camming them against the paper stack to raise the drooping flaps that would ordinarily prevent entrance of the pins, and as the pins move downwardly they slide off the plates and the springs 136 return the plates to

normal position. During the downward travel of the pins the pressure of the stack against the abutment plate is relieved by the bar 137 until the pins almost reach the bottom of the abutment plates. At this point the cam 142 moves away from the rocker arm 140 to permit the spring 143 to swing the bar away from the stack, as shown in Fig. 8. The pins now engage the lever 146 to move the teeth 149 downwardly away from the fold 81 permitting the pins to carry the papers off the rack and under the abutment plate (Fig. 9). The pins then move off the lever 146 permitting the springs 150 to move the teeth again into engaging position with the next paper; thus preventing its displacement with the removed section. The paper section in the next lower rack is now opened in like manner to permit entrance of the section from the upper rack, and so on, until all the sections have been nested on the pins. The nested sections are then brought between the rollers 151 and 152, which are driven at a greater speed than the conveyor chains, so that the increased speed of the assembled sections relieve pressure of the pins against the folds 81. The heads of the pins now enter the slotted guide 159 causing the pins to be retracted from the sides of the paper, the rollers in the meantime feeding the papers upon the offtake conveyor 160.

The pins are then carried by the chains about the sprockets 51 into engagement with the guides 167 to cause them to be returned to normal paper engaging position.

Thus it will be apparent that I have provided a machine that will assemble the sections automatically with dispatch and efficiency and deliver the assembled papers therefrom ready for circulation in the comparatively short interval between the printing of the news section and the time for circulation.

What I claim and desire to secure by Letters Patent is:

1. In a machine for assembling folded sections of a newspaper including superimposed racks for supporting the sections on their folded edges, a conveyor, means for driving the conveyor across the racks, pins on the conveyor for engaging the folds of the sections to move the sections into nested relation, means opening the sections to receive the pins, means for withdrawing the pins laterally from engagement with the nested sections, and means for discharging the assembled sections.

2. In a machine for assembling folded sections of a newspaper including superimposed racks for supporting the sections on their folded edges, a conveyor, means for driving the conveyor across the racks, pins on the conveyor for engaging the folds of the sections to move the sections into nested relation, means opening the sections to receive the pins, means independent of the conveyor for withdrawing the pins from engagement with the nested sections, and rollers for moving the assembled sections faster than the travel of the conveyor to relieve pressure from the pins.

3. In a machine for assembling folded sections of a newspaper including superimposed racks for supporting the sections on their folded edges, a conveyor, means for driving the conveyor across the racks, means driven by the conveyor for opening the sections, and means on the conveyor for engaging the folds of the opened sections to move the sections into nesting position.

4. In a machine for assembling folded sections of a newspaper including superimposed racks for supporting the sections on their folded edges, conveyor means engaging the fold of a section in the uppermost rack to move the section downwardly into nesting engagement with a section in the lower rack, means for discharging the assembled paper from the machine, and movable means operable by the conveyor for retaining the remainder of the sections within their racks during the removal of a section by the conveyor.

5. In a machine for assembling folded sections of newspapers including racks for supporting the sections, abutment plates at the ends of the racks, conveyor chains adapted for travel along the plane of the abutment plates, pins slidable in the chains for projection into the folds of the sections, means for opening the sections to receive the pins, means for moving the conveyor to bring the sections into nestled relation, and means for retracting the pins through the conveyor chains to release the nested sections.

6. In a machine for assembling folded sections of newspapers including racks for supporting the sections, abutment plates at the ends of the racks, conveyor chains adapted for travel along the plane of the abutment plates, pins slidable in the chains for projection into the folds of the sections, means for opening the sections to receive the pins, means for moving the conveyor to nest the sections, means for retracting the pins through the conveyor chains to release the nested sections, and means for returning the pins to initial position.

7. In a machine for assembling folded sections of newspapers including racks for supporting the sections, abutment plates at the ends of the racks, pusher bars below the abutment plates for engaging the lower portions of the sections to relieve pressure of the sections against the said plates, conveyor chains adapted for travel along the plane of the abutment plates, pins slidable in the chains for engaging the folds of the sections, means for opening the sections to receive the

pins, means for moving the conveyor to bring the sections into nested relation, and means for retracting the pins through the conveyor chains to release the nested sections.

8. In a machine for assembling folded sections of newspapers including racks for supporting the sections, abutment plates at the ends of the racks, conveyor chains adapted for travel along the plane of the abutment plates, headed pins slidable in the chains for engaging the folds of the sections, means for opening the sections to receive the pins, means for moving the conveyor to bring the sections into nested relation, and a track for engaging the heads of said pins to retract the pins from engagement with the nested sections.

9. In a machine for assembling folded sections of newspapers including racks for supporting the sections, abutment plates at the ends of the racks, means for feeding the sections against the abutment plates, conveyor chains adapted for travel along the plane of the abutment plates, pins slidable in the chains for engaging the folds of the sections, means for opening the sections to receive the pins, means for moving the conveyor to bring the sections into nested relation, and means for retracting the pins through the conveyor chains to release the nested sections.

10. In a machine for assembling folded sections of a newspaper including racks for supporting the sections, abutment plates at the ends of the racks having angularly inclined portions, means for opening one flap of each section against the inclined portion of a relative abutment plate, conveyor chains arranged along the abutment plates, pins carried by the chains for engaging the folds of the sections and adapted for carrying the sections into nested relation, means for retracting the pins from engagement with the assembled sections, and roller means acting simultaneously with the retracting means to increase the speed of the assembled paper with relation to the speed of the conveyor.

11. In a machine for assembling folded sections of a newspaper including racks for supporting the sections, abutment plates at the ends of the racks having angularly inclined portions, means for opening flaps of the sections against the inclined portion of a relative abutment plate, conveyor chains passing along the abutment plates, pins carried by the chains for engaging the folds of the sections to carry the sections into nested relation, and means actuated by the pins for retaining the opposite flap of the sections away from the opened flap during entrance of the pins between the flaps.

12. In a machine for assembling folded sections of a newspaper including racks for supporting the sections, abutment plates at the ends of the racks having angularly inclined portions, vacuum cups for opening flaps of the sections against the inclined portions, conveyor chains passing along the abutment plates, pins carried by the chains for engaging the folds of the sections to carry the sections into nested relation, and means actuated by the pins for retaining opposite flaps of the sections away from the opened flap during entrance of the pins between the flaps.

13. In a machine of the class described, superimposed racks for supporting folded paper sections on their folded edges, abutment plates at the ends of the racks having upwardly and outwardly inclined portions, means for opening a flap of the first section in each rack against the inclined portions of the abutment plates, conveyor chains arranged along the sides of the abutment plates, carrier means on the chains for entering between the opened flaps to successively engage the folds of the sections to move the sections into nested position.

14. In a machine of the class described, superimposed racks for supporting folded paper sections on their folded edges, abutment plates at the ends of the racks having upwardly and outwardly inclined portions, means for opening a flap of the first section in each rack against the inclined portions of the abutment plates, and an arm movable over the inclined portion of the abutment plates to retain the flaps in open position during the entrance of the carrier means.

15. In a machine of the class described, superimposed racks for supporting folded paper sections on their folded edges, abutment plates at the ends of the racks having upwardly and outwardly inclined portions, means for opening a flap of the first section in each rack against the inclined portions of the abutment plates, means for retaining the other flap against the adjacent folded sections in the racks, conveyor chains arranged along the sides of the abutment plates, carrier means on the chains for entering between the opened flaps to successively engage the folds of the sections to move the sections into nested position.

16. In a machine of the class described, racks for supporting folded sections, abutment plates at the ends of the racks, pusher bars below the abutment plates for engaging the lower portions of the sections to relieve pressure of the sections against the abutment plates, conveyor chains adapted for travel along the plane of the abutment plates, carrier means on the chains, means for opening flaps of the sections to permit entrance of the carrier means to engage in the fold of the sections for moving the sections into nesting position, and means for actuating the pusher bars to relieve pressure of the sections

against said abutment plates during entrance of the carrier means.

17. In a machine of the class described, superimposed racks for supporting folded sections, abutment plates at the ends of the racks, vibratory means for feeding the sections against the abutment plates, means for successively moving the sections from the upper rack into nesting position with the sections in the lower rack, and means for discharging the nested sections.

In testimony whereof I affix my signature.

CARLETON J. ELLSWORTH.