July 2, 1929. L. A. COGSWELL 1,718,948

AUTOMATIC TOP LIFT GRADING AND DISTRIBUTING MACHINE

Filed July 31, 1922 5 Sheets-Sheet 1

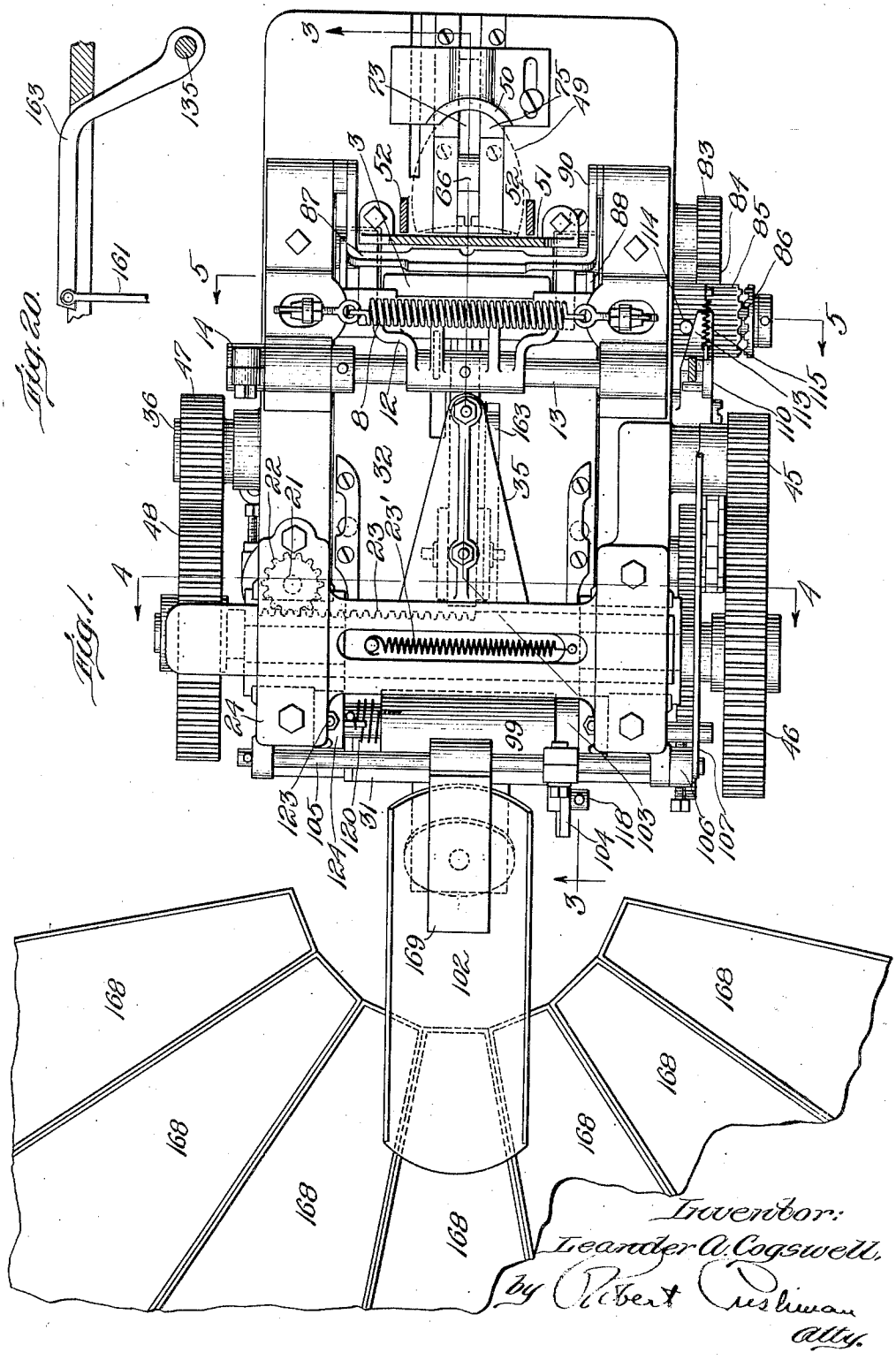


Fig. 1.

Fig. 2a.

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Filed July 31, 1922 5 Sheets-Sheet 2

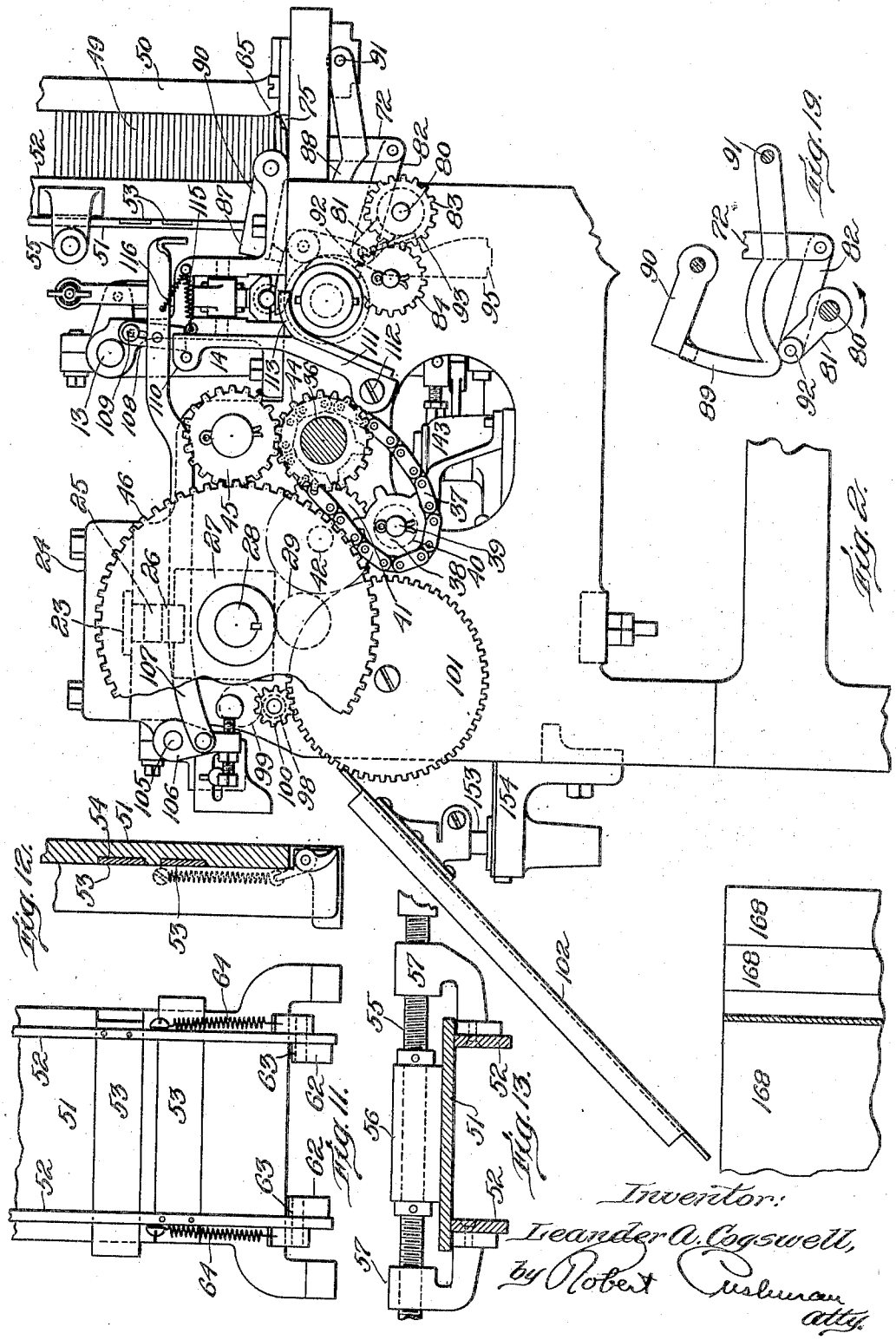


Fig. 12.

Fig. 11.

Fig. 13.

Fig. 14.

Fig. 2.

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AUTOMATIC TOP LIFT GRADING AND DISTRIBUTING MACHINE

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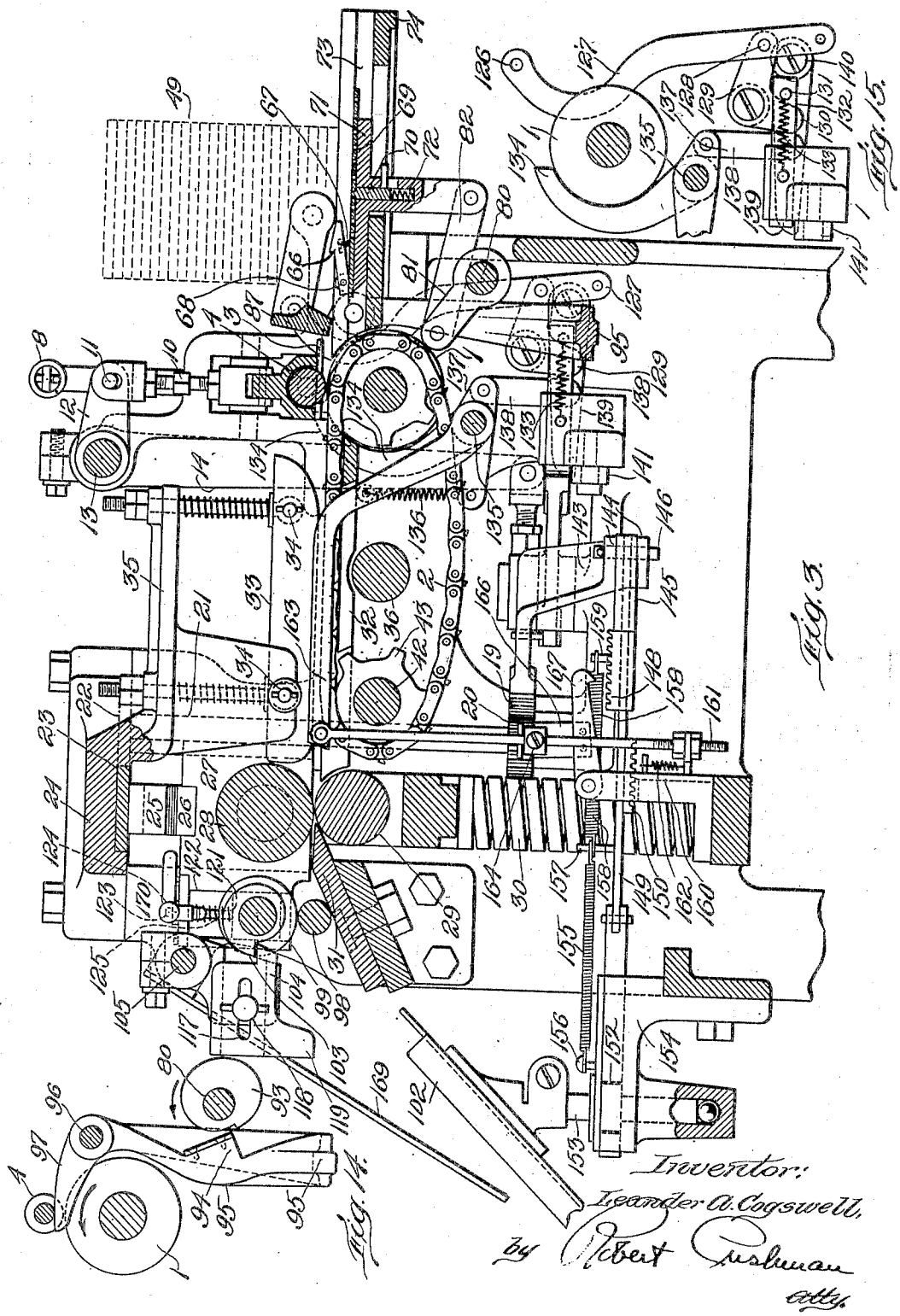


Fig. 3.

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AUTOMATIC TOP LIFT GRADING AND DISTRIBUTING MACHINE

Filed July 31, 1922 5 Sheets-Sheet 4

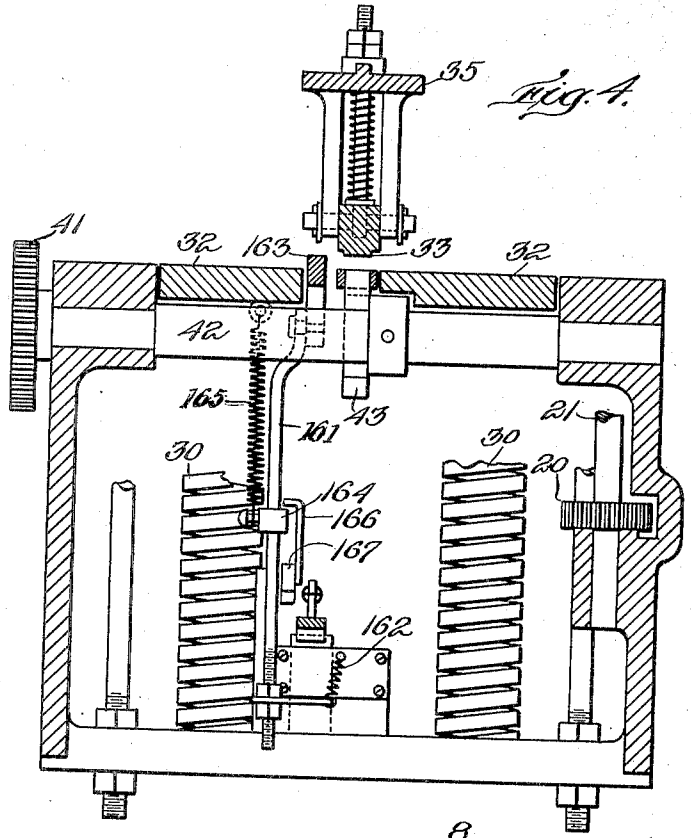


Fig. 4.

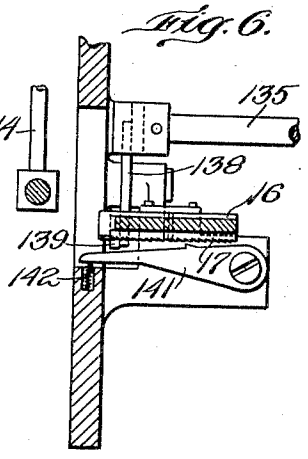


Fig. 6.

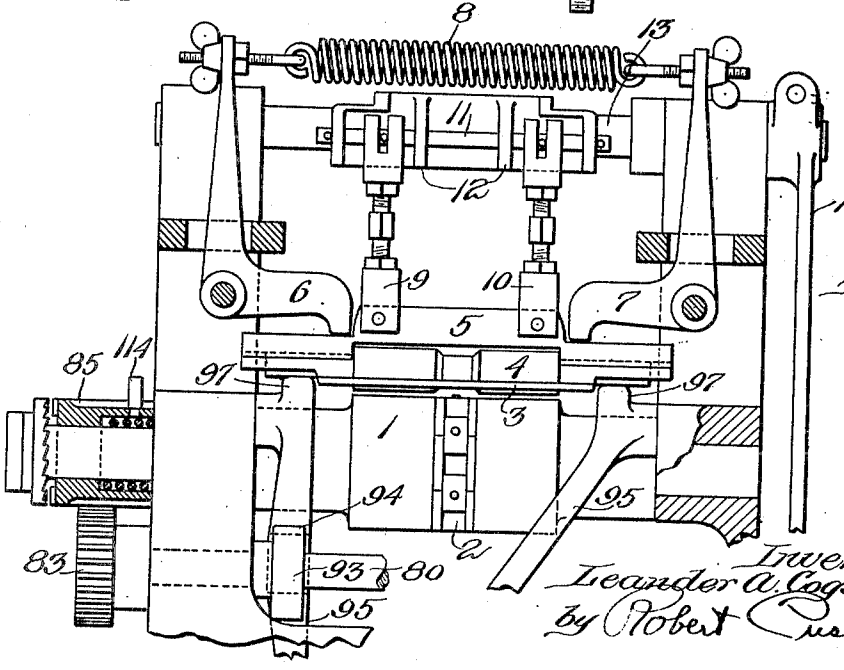


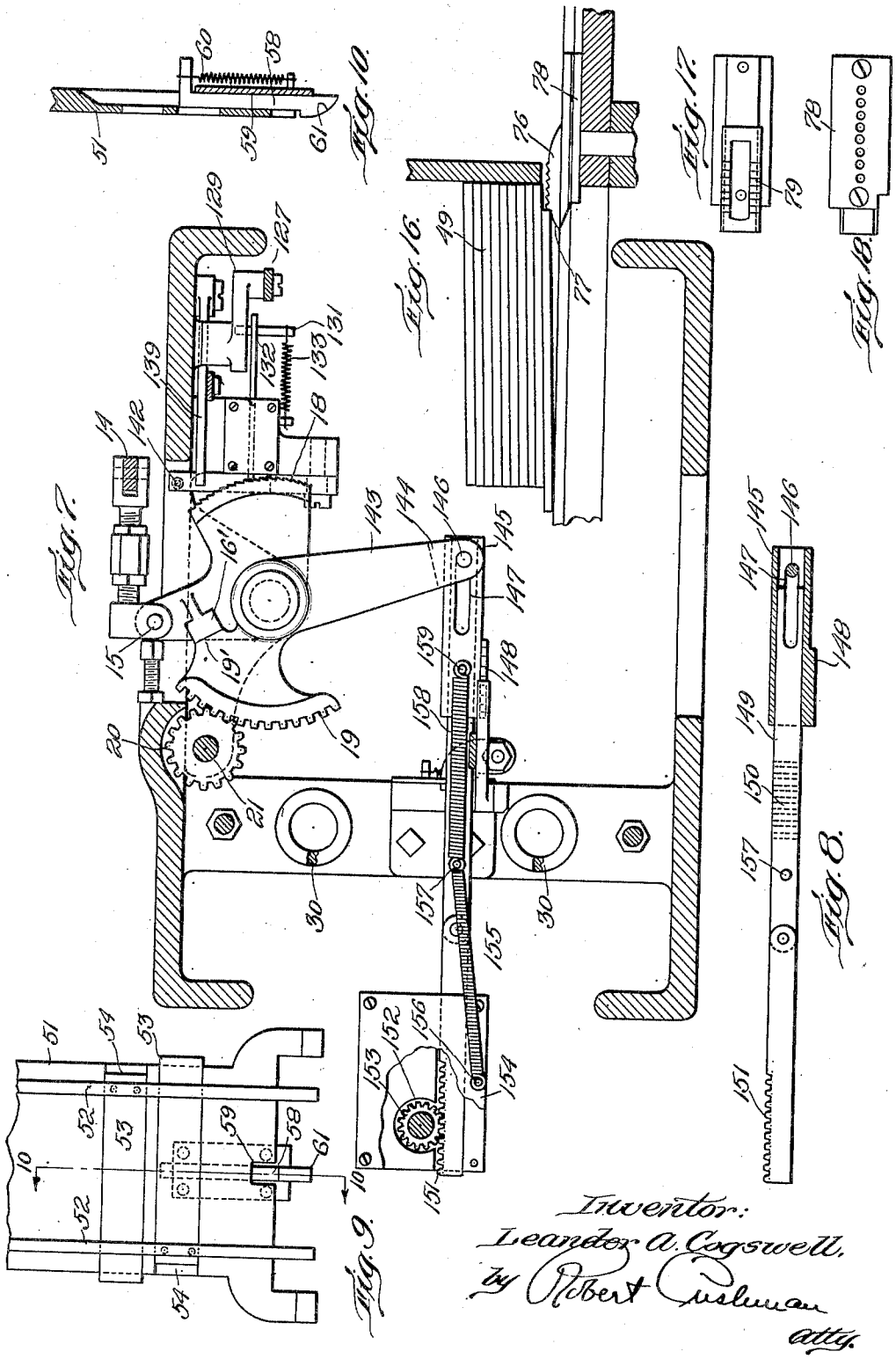
Fig. 5.

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AUTOMATIC TOP LIFT GRADING AND DISTRIBUTING MACHINE

Filed July 31, 1922 5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE.

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AUTOMATIC TOP-LIFT GRADING AND DISTRIBUTING MACHINE.

Original application filed August 20, 1921, Serial No. 494,009. Divided and this application filed July 31, 1922. Serial No. 578,639.

This application is a division of an application filed by me for an automatic top-lift grading and distributing machine, August 20, 1921, Serial No. 494,009, to which reference is made for a full description of the objects and principles of the machine as a whole. The present application has to do primarily with those features of the invention which include, in the combination, skiving, splitting or evening devices.

Referring to the drawings illustrating a preferred embodiment of the invention,—

Fig. 1 is a plan view of my machine;

Fig. 2 is a side view on a reduced scale, partially in cross section;

Fig. 3 is a longitudinal cross-sectional view on the line 3—3, Fig. 1;

Fig. 4 is a cross-sectional view on the line 4—4 of Fig. 1;

Fig. 5 is a front view partly in section on the line 5—5 of Fig. 1;

Fig. 6 is a fragmentary view, partly in cross-section taken just back of the ratchet plate and looking to the right (Fig. 3) of the pawl and ratchet mechanism;

Fig. 7 is a horizontal fragmentary view illustrating the mechanism for actuating the distributing chute;

Fig. 8 being a detailed view of the rack bar and sleeve shown in Fig. 7;

Fig. 9 is a fragmentary plan view of the feed hopper devices;

Fig. 10 being a view, partly in cross-section, on the line 10—10 of Fig. 9;

Figs. 11 and 12 are views similar respectively to Figs. 9 and 10 but of a modified construction;

Figs. 11, 12 and 13 also show the blank guides and accompanying mechanism, Fig. 13 being a horizontal cross-sectional view taken at about the point of the broken top of the hopper, Fig. 2;

Fig. 14 is a fragmentary cross-sectional view of the lever and cam construction acting to separate the feeding and gaging rolls;

Fig. 15 is a detailed view, partly in cross-section, showing the tripping mechanism;

Figs. 16 and 17 and 18 are details of a modified form of blank separating and feeding device, Fig. 16 being a central vertical section of a fragmentary portion thereof, Fig. 17 being a top plan view of the blank engaging reciprocator and Fig. 18 being a bottom plan view thereof;

Fig. 19 is a fragmentary view and side elevation of a portion of the gate opening means; and

Fig. 20 is a fragmentary view in section showing, in side elevation, the distributor unlocking trip.

In the more complete embodiment of my invention as herein shown there are six principal elements or groups, viz, a hopper or blank supplying mechanism for supplying and feeding the blanks one by one to the feeling or detecting mechanism, said feeling or detecting mechanism which transmits its determinations to a distributor, a setter or setting mechanism which adjusts the distributor as well as the skiving means, the blank being passed along to an evening or skiving mechanism from which it is taken by a delivering mechanism and delivered to the distributor, said distributor having meanwhile been adjusted and set by the distributor adjusting and setting mechanism. In carrying out my invention I have availed myself of the principal parts of one type of the Nichols evening and grading machine, although it will be understood that I am not limited to this mechanism and that for instance the stack feature may be omitted and that my invention in its principal objects may be carried out in connection with various other grading mechanisms or splitting and grading mechanisms. The feed roll 1 and chain 2, detector or feeler plate 3 (and a detector or feeler roll 4 in connection therewith the facilitate the movement of the blanks) above which is a yoke 5 engaged adjacent its opposite ends by bell crank levers 6 and 7 held under tension at their upper ends by an equalizer spring 8, and said yoke carrying vertical feelers or feeler posts or detectors 9 and 10 connected at 11 to arms 12 extending from a rock shaft 13, may be and are in general type the same as in the Nichols Patent, 1,046.213, dated Dec. 3, 1912. The feeling or detecting and transmitting and adjusting mechanisms of my present machine are substantially the same, at least in general type, as in said patent and accordingly I have not undertaken herein to show all the details thereof. As herein shown a crank 14 is on the right hand end,

Fig. 5, of rock shaft 13 and connects pivotally at 15, Fig. 7, to a pivotally mounted sector 16, having on its under side teeth 17 (corresponding to the teeth 34 of said patent). A second sector, provided with a segmental rack 19, is pivotally mounted on the same axis on which sector 16 is pivoted, and on the opposite side of such axis. An abutment 16′ on sector 16 engages a corresponding abutment 19′ on the other sector, so that when sector 16 is turned on its axis contra-clockwise the segmental rack 19 and sector 16 will move together as one piece; but the sector 16 is free to turn in a clockwise direction independently of rack 19. The segmental rack 19 meshes with pinion 20, whose shaft 21 carries at its upper end a similar pinion 22 in engagement with a sliding rack bar 23 mounted in the cross head 24, see Fig. 3, and provided on its under side and opposite ends with depending inclines or cam stops 25 to cooperate with reverse inclines 26 fixed on the journal boxes or bearings 27 which carry the opposite ends of the pressure gage roll 28, all operating to control the splitting as adjusted in response to the adjusting mechanism as in said Patent 1,046,213. The sliding bar 23 carrying the stepped inclines or wedges 25 is normally urged by spring 23′ (Fig. 1) toward the front of Fig. 1, that is, in the direction to cause the stepped inclines 25 to separate from the stepped inclines 26 and to cause the segmenal rack 19 to swing in a clockwise direction as viewed in Fig. 7. Therefore if the stepped inclines 25, 26 are out of engagement and the bar 23 is free to shift under the influence of spring 23′, the abutment 19′ will follow the abutment 16′ and remain in engagement therewith as the sector 16 swings in a clockwise direction. If however a piece of stock is between rolls 28 and 29 the lower stepped wedges 26 will be firmly clamped against the upper stepped wedges 25 thereby rigidly holding the slide bar 23 immovable. If now the sector 16 should be actuated in a clockwise direction by a succeeding blank, while the preceding blank is still between rolls 28 and 29, the sector 16 is free to swing in a clockwise direction independently of rack 19. Ordinarily the blanks will be of such dimensions and the machine will be so timed that this independent movement of sector 16 will be unnecessary, and all practical requirements will generally be served if 16 and 19 are united in fixed relation to each other or made in one solid piece. But under certain circumstances it might be advantageous to provide for such independent movement of sector 16. Beneath the upper gage or feed roll 28 is a lower feed roll 29 held yieldingly upward by springs 30 to cooperate with the skiving or splitting knife 31 (shown as the knife construction of Patent 1,205,104 to Nichols). The work travels over a bed 32 beneath a shoe or presser plate 33 pivotally supported yieldingly at 34 from a bracket 35. The drive shaft 36, Fig. 2, drives a sprocket chain 37 and sprocket wheel 38 on whose shaft 39 is a pinion 40 meshing with a gear 41 whose shaft 42 carries the sprocket wheel 43, Fig. 3, which drives the sprocket chain 2 which in turn drives the front feed roll 1. The shaft 36 also carries a gear 44 in mesh with a pinion 45 which engages a gear 46 on the near end, Figs. 1 and 2, of the upper out-feed roll or pressure roll 28. On its farther end, Figs. 1 and 2, the main shaft 36 has a pinion 47 which drives the gear 48 of the lower out-feed roll 29.

I have illustrated my invention in connection with the foregoing mechanism which is or may be in general type substantially the same as in the Nichols Patent No. 1,046,213 before mentioned, but it will be understood that although I have utilized much of this old mechanism, the relations and combinations in which it is used are new and enable me to produce the automatic feeding, gaging, evening and distributing as will be understood in the course of the following description, and enable me to accomplish the final result with speed and accuracy.

For convenience, and preferably, the feeding is accomplished from a stack, the blanks 49 being herein shown as deposited between a stationary but adjustable front wall 50 and a fixed rear wall 51. The latter is shown in detail in Figs. 1, 2, 9–13. This wall 51 carries lateral vertical guides 52 held in true vertical parallelism by lateral members 53 fitting transverse grooves 54 in the front of the upright 51, and they are simultaneously moved toward or from each other by a right and left hand screw 55 mounted to turn in a fixed bracket 56 and carrying opposite nuts or arms 57 extending thereto from the respective guide uprights 52, so that when the guide screw 55 is turned over to the left, Fig. 2 and Fig. 13, the guides 52 will be separated to fit wider stock than previously might have been in the hopper. My machine is especially constructed to handle thin and difficult work. One difficulty with the previous machine (Patent No. 1,281,639) was that it might feed two pieces of work at the same time, particularly such as thin top-lifts, and accordingly to prevent this I have mounted on the lower end of the rear of the hopper blank retarders, one form being shown in Figs. 9 and 10 and another form in Figs. 11 and 12. Referring to Figs. 9 and 10 it will be seen that a bar 58 is mounted to move up and down in a way 59 provided at the rear of the wall 51, said bar being held down yieldingly by a spring 60 and provided with a beveled foot 61 in position to be engaged by the lower pieces of work, such as top-lifts. Thus when a top-lift is moved rearward in the machine by the feeding mechanism it moves against the foot 61 with only slight resistance at the

very bottom edge of said foot but if a second or third top-lift should be accidentally moved along frictionally by and with the bottommost top-lift said upper lifts will engage forcibly against the upper portion of the foot and will thereby be held back as the only way the said upper top lifts can get through is against the frictional resistance of the foot 61 and the resistance of the spring 60. This form of retarder is especially adapted to very small and thin top lifts. The form shown in Figs. 11 and 12 consists of two depending deflectors 62 pivoted at 63 in the lower ends of the guides 52 and normally held downward by springs 64 but otherwise acting very much the same as the foot 61. Opposite these deflectors or at the rear side of the front wall 50 I cut away said wall to provide a beveled recess 65 which enables the lower top lifts to drop down more readily to position for being fed into the machine when the reciprocating device returns after having fed forward the bottommost blank. If this wall were straight without said recess there would be a frictional resistance which might result in the next blank remaining stuck or not dropping into feeding position. In Figs. 1 and 3 I have shown a feed hook or work projector in the form of a hook 66 held under upward tendency by a spring 67 and pivoted at 68 to an adjustable plate 69 engaged by a yielding stud 70 held in a carrier 71 at the upper end of a reciprocating post 72, said carrier being mounted to reciprocate in ways 73 in the top of the table 74 which carries the hopper and blank engaging mechanism thus far described. As my machine is especially arranged to handle very small piece of stock such as small sizes of heel lifts for instance, it is necessary that the reciprocator or work projector 66 shall move very close to the rolls 1 and 4, so that the bevel or inclination of said projector between its pivot and the engaging shoulder or hook has to be quite steep. In view of this fact, together with the necessity for handling curled and often very thin pieces of stock I have provided at each side of the raceway 73 stationary inclines 75 which serve to hold the rear edge of even badly curled pieces of stock in such a position that the hook is sure to engage said pieces sufficiently to project them. In Figs. 16–18 I have shown a form of projector which can handle still smaller pieces of stock (because it can go closer to the feed and detecting rolls). This form consists of a projector plate 76 having a short bevel 77 and mounted on an adjacent plate 78 substantially the same as plate 69. Preferably this plate 76 is roughened or knurled at its top 79 to aid in bringing back the next or second top lift when the first has just been fed or projected. The projector 66 and connected parts are actuated by a rotary shaft 80 whose crank 81 is connected by a link 82 to the reciprocating post 72, said rotary shaft being actuated by a gear 83 on its outer end, see Figs. 1 and 2, meshing with an idler 84 in engagement with a clutch gear 85 normally idle but actuated at the proper moment to engage a continuously rotating clutch part 86 fast on the outer end of the feed roll shaft which carries the roll 1.

As before emphasized, my invention is specially adapted to handle difficult stock (such as curled and thin and small pieces) and accordingly one of the features on which I place special emphasis is the provision of means for separating the ingoing rolls 1 and 4 of the detecting mechanism and raising the gate 87 (which, however, in my machine performs more the function of a trip than of a gate proper), so that even the thinnest or most refractory stock is sure to get in place between the detector rolls. Without this feature such stock would be apt to turn up against the gate or wedge or crumple against the rolls, but by this provision the gate is raised just before the blank reaches it and then the blank is fed onward into position beneath the then separated rolls which immediately come down on it in the performance of their feeling or detecting operation and at the same time the gate or trip 87 falls on the top surface of the stock where it rests until the stock passes out from under it. The gate is lifted by a cam lever 88 whose free end 89 loosely engages the arm 90 of the gate, said cam lever being pivotally connected at 91 to the under side of the table and having its cam portion in position to be engaged by the swinging end 92 of the crank 81 fast on the inner end of the shaft 80, see Figs. 2 and 19 as before described. The upper roll 4 is lifted by the engagement of a cam 93 mounted on the shaft 80, with a tripping shoulder 94 of a yoke 95, see Figs. 3, 5 and 14, pivoted to the frame at 96 and whose opposite ends 97 project under the opposite ends of the upper roll 4 in position to lift said roll under the actuation of the cam 93. The top lift or piece of stock is carried along from the feeler or detecting mechanism by the chain 2 to the outgoing rolls 28, 29 where it is evened by the skiving knife 31 in accordance with the thinness measurement or detection to which said rolls have been set, and the evened or skived blank is then instantly grabbed by two delivery rolls 98 and 99, Figs. 1, 2 and 3, the former being driven by a pinion 100, Fig. 2, and idler 101 which is in turn driven by the pinion 41.

These rolls 98, 99, have several important and striking functions but their main purpose is to insure delivery of the blank and also to make sure of a quick delivery. The main purpose of an automatic feeding and distributing machine is to save labor, and therefore such a machine, to be successful, must do the work quicker than skilled hand labor. Hence the parts of my machine are so coordinated that they hurry the blank into the

machine and hurry it out of the machine with no liability of the blanks sticking or pausing or being delayed at any point. Therefore the rolls 98, 99 are provided to seize the blank and propel it rapidly forward into a chute 102 provided for it for distributing the successive blanks to different receptacles according to their grade. A second function of these rolls which also conduces to speed is due to the arrangement by means of which they positively and instantly start the blank feeding mechanism and means for raising the gate and separating the ingoing rolls the instant that the outgoing blank has proceeded far enough to be sure of being distributed before the chute 102 changes to the next position. As herein shown this is accomplished by providing a cam 103, see Fig. 3, on or as a part of the roll 99 to engage an arm 104 on a rock shaft 105 provided at its outer end, Fig. 2, with a rocker arm 106 connected by a link 107 to a trigger or actuator 108 pivoted at 109 on an adjacent stationary part of the machine and depending to engage and actuate the free end 110 of a cam carrier bar 111 pivoted at 112 to the frame of the machine whose cam or cam plate 113 is best shown in Fig. 1 in position to engage a pin 114 projecting into its path from the loose clutch member 85, and springs 115, 116 being preferably provided to insure quick and proper positioning of the parts. Thus as soon as the roll 99 has rotated sufficiently in its work of delivering or ejecting the skived blank to swing the arm 104 rearward the clutch is thereby connected so as instantly to start the feeding of the next blank and the raising of the gate 87 and the separation of the rolls 1, 4 to receive said blank. In view of the difference in lengths of different blanks and other technical requirements of the stock, I have made the free end of the arm 104 adjustable by means of a slot 117 and wing nut 118. If desired also this free end of the arm may depend as shown at 119 in the path of the blank so that if the cam 103 is not used the blank itself will hit the arm or this depending portion 119 thereof and accomplish the tripping of the clutch. The roll 98 is positively driven but as herein shown the roll 99 is driven by the engagement therewith of the stock, and is returned to its original position by a spring 120 wound around its farther end, Fig. 1, and secured at one end to the bracket or journal and at the other end to the roll. To insure that the rolls 98, 99 shall invariably grip the work, and bearing in mind that sometimes the front edge of a piece of stock may be slightly thinner than the body of the stock, I have mounted the roll 99 for movement slightly independent of the outgoing pressure gage roll 28. To this end the journal box 121 of the roll 99, see Fig. 3, is mounted for vertical adjustment on the box 27, of the roll 28, being carried in a raceway 122 therein and provided with a stud 123 extending up from the box 121 and limited by a nut 124 in its downward movement and held against said nut yieldingly by a spring 125 within the raceway. This gives a capacity for regulating the tension of the roll 99 and permitting it to be normally slightly nearer the roll 98 than the adjustment of the roll 28 from the skiving knife 31. This construction also gives a capacity for compressing the stock when desirable for certain qualities of blanks. The gate constitutes governing means to control the admission of blanks to the grade detector means and is itself under the control of the above-described actuating means.

I will now describe the mechanism which adjusts and sets the blank distributor. Pivoted at 126 on the gate is a depending link 127 best shown in Figs. 3 and 15. This link 127 is pivotally connected at 128 to the free end of a bell crank 129 whose lower end 130 engages a pin 131, see Fig. 7, of the detent 132 to hold the same back to the right, Figs. 7 and 15, a spring 133 moving said detent in the opposite direction to engage the locking teeth 18 of the segmental ratchet 16. As the blank gets in position between the feeler or detecting rolls and the latter begin their feeling or thinness-detecting operation the front edge of the blank strikes the upper end of a trip 134, see Figs. 3 and 15 (and corresponding substantially to the finger 46 or to the roll trip 43 of Patent 1,046,213), carried by shaft 135 and normally held towards said rolls by a spring 136, said shaft having an arm 137 connected by a link 138 to lift a depressing arm 139 which is pivoted at 140 to the frame of the machine and normally depresses or holds out of engagement with the teeth 17 the pawl 141, see Fig. 6, said pawl being normally under tendency to move upward by a spring 142. As the work is fed between the detecting rolls 1, 4 and said rolls approach each other in engagement with said work the sector 16 is swung around to the left, Fig. 6 and right or contra-clockwise, Fig. 7 (it being understood that the sector has been moved to the right, Fig. 6, or left or clockwise Fig. 7 prior to this time when the rolls 1 and 4 were separated) and the successive increments of thinness measurement are preserved by the engagement of the pawl 141 with the teeth 17. Rigid with the sector 19 is an arm 143 bifurcated at its free end 144, Fig. 3, to embrace a sleeve 145 and provided with a vertical pin 146 passing through the upper and lower slots 147 in said sleeve. This sleeve at its left has a ratchet 148. A rod 149 reciprocates in said sleeve and is provided on its under side with a notched lock plate 150, see also Fig. 8, whose right hand end, Fig. 3, constitutes a stop to abut against sleeve 145 and at its rear end said rod 149 has a rack 151 in engagement with a pinion 152 fast on a post 153 to whose upper end is secured (preferably removably) the chute

102. The pinion 152 and shaft 153 are carried by a housing and bracket 154, see Figs. 2, 3 and 7. A relatively light spring 155 is fastened at one end to a stud 156 on this bracket and at its opposite end to a pin 157 projecting from the rack bar 149. A relatively heavy spring 158 is secured at one end to said pin 157 and at its opposite end to a pin 159 on the sleeve 145. Cooperating with the lock plate 150 is a dog 160 mounted on a rod 161 and under normal upward impulse by a spring 162, said rod being given vertical movement by a trip bar or unlocking shoe 163, see Figs. 1, 3, 4 and 20, said shoe being mounted at its pivotal end on any convenient member herein shown as loosely mounted on the shaft 135. The trip bar 163 is actuated by the blank passing through the machine. On the rod 161 is secured a block 164 and here also is preferably a spring 165 for giving further upward impulse or tendency to the rod and all connected parts, said block 164 being engaged on its upper side by the upper end of a hook 166 secured at its lower end to a dog or latch 167 in position to engage the ratchet 148. Thus while the top lift or piece of work is being felt of and its determinations transmitted to the sector 16 and adjacent setting mechanism and therefrom to the rack and wedge bar 23, 25, the pin 146 of the arm 143 is being simultaneously and similarly adjusted and when finally the gate 87 falls and brings the feeler transmissions to a halt by locking said sector by means of its detent 132, said pin 146 likewise comes to a halt, thereby preserving the same final thinness measurement that corresponds to the adjustment of the sector 16. As the latch 167 has been in a raised position out of engagement with the ratchet 148 during this adjustment of said pin 146 it follows that the sleeve 145 has been free to be moved by said pin in case the position in which it was left when the preceding blank was being detected requires said movement. Usually this is the case. The spring 158 always holds the sleeve as far as it can to the left, Figs. 3, 7, and 8. All the adjustment just secured takes place without disturbing the chute 102. When roll 4 is raised, sector 16 is thereby usually swung forward or around to the left, clockwise, Fig. 7 the extent depending upon the grade of blank to which the parts were previously set. As previously set, the sleeve 145 is against the stop or right hand end, Fig. 3, of lock plate 150 and the pin 146 is against the right hand end of slot 147. If chute 102 is then at the near side Fig. 1, to deliver a blank into the receptacle 168 for the thinnest blank being handled, say 3-iron, and the succeeding blank proves to be a 3-iron blank the parts will remain unchanged, excepting that the pin 146 will move out to the left in the slot as the roll 4 is raised and will then go back again to its original position. But if the succeeding blank proves to be a thicker blank, say 4-iron, 5-iron, or 6-iron (the latter calling for a final positioning of the chute 102 as shown in the drawings) the arm 143 and its pin 146 will be adjusted in the slot 147 to the left Figs. 3 and 7, and then when the detent 160 is unlocked from the lock plate 150 the spring 155 will pull the parts to the left until the right hand end of slot 147 strikes against the pin 146 and is stopped thereby. If however the chute 102 is not set for a thin blank but is set for a thick blank, say 9-iron, to deliver into the receptacle 168 at the extreme rear of Fig. 1, and the next blank being detected proves to be a thinner blank, say 6, 7, or 8-iron, the adjusting movement of the arm 143 and pin 146 in response to the detection of the feeler mechanism will be to the right Figs. 3 and 7, thereby separating the sleeve from its stop, the pin 146 maintaining continuous engagement with the right hand end of slot 147 and when the detection of said succeeding blank is completed and the arm 143 locked in its adjustment, the unlocking of the detent 160 permits the heavy spring 158 instantly to bring together the sleeve against the stop 150 thereby pulling around to the right the parts 149, 152, 153 and 102 and against the resistance of spring 155. After the preceding blank has been delivered by the chute to the receptacle for which the chute was set, the lock plate 150 is disengaged by the next succeeding blank, which presses down the shoe 163 and unlocks the detent 160, and thereupon the sleeve and stop or right hand end of said lock plate are brought together by the spring 158, if not already together, and all the connected parts are moved so far as may be required by the new adjustment of the setting mechanism due to the succeeding blank which has meanwhile been felt of, said movement being accomplished by either the spring 158 or the spring 155 as just explained, leaving the parts with the pin 146 hard against the right hand end of the slot 147 and the sleeve and stop together. As soon as said next succeeding blank passes clear of the shoe 163 the rod 149 is again locked by detent 160 and so remains until the said succeeding blank for which it has just been set has passed through the evening mechanism and been delivered into its proper receptacle 168. In other words the mechanism is so arranged that said chute is left undisturbed and locked as long as possible so as to be sure to receive and distribute the blank discharged from the rolls 98, 99 before the adjusting operation begins on said chute for the next blank. This construction, therefore, tends to increase the speed that is possible in handling blanks. In other words the succeeding blank is being fed into the machine and its thinness determined and said determination transmitted and the distribu-

tor adjusted in accordance therewith, all excepting the chute, while the preceding blank is being fed out of the machine, discharged, and distributed by the chute. Said chute is under control from said grade determining means but adjusted or set out of time with the latter's adjusting control of the evening mechanism or splitter. Instantly upon the discharge and distribution of the blank by the chute, the succeeding blank comes into contact with the unlocking shoe 163 which through the parts 161 and 160 unlocks the lock plate 150, whereupon the spring 155 or 158 instantly actuates said rack bar and causes the same to rock or rotate the chute in accordance with the position of the pin 146. At the same moment that the dog 160 was moved to unlock said rack bar, the latch 167 was caused to hold the sleeve 145 against movement to the right, although it may move to the left by either the spring 155 or spring 158 as may be required to bring the right hand end of the slot 147 against the pin 146 now stationary in its new adjustment or to cause the sleeve 145 and the lock plate 150 to abut so that by the time the chute 102 has swung to its new position under the influence of one or the other of said springs the parts are practically locked so as to resist the rebound of said chute and hold the same steady in the new adjustment. As soon as the blank which has caused this operation by depressing the shoe 163 passes from said shoe between the rolls 28, 29, the shoe springs up and thereby causes the detent 160 to lock into the lock plate 150 and thereby hold the chute 102 immovable in its new adjustment while at the same time releasing the sleeve 145 and right hand end of the setting or adjusting mechanism of the distributor so that said mechanism is now free to be adjusted and set again by the next blank to be fed. The feeding of said next blank takes place at about the same instant under the tripping action resulting from the cam 103 of the roll 99 acting through the parts which connect therefrom to the feeding mechanism at the front of the machine. In the Nichols machines the mechanism was required to move back to a given starting point always from whatever adjusted position to which it might previously have been set, whereas here the movement is minimized and is usually simply from one receptacle 168 to the next selected one, and the chute and connected parts do not always have to move back to the front position Fig. 1, and thence swing around each time through a relatively large circuit. In other words, I have provided mechanism which goes from one adjustment to the next and does not have to swing back to a given starting point and then swing from that starting point through the whole range to the next adjustment. This tends materially to aid in increasing the speed or output of the machine. Thus the chute 102 delivers the blank into the selected receptacle 168, Fig. 1, and as the blanks are ejected positively I provide a guard or deflector 169 to prevent their jumping beyond or away from the chute. In some cases, as for chrome leather, it is sometimes desirable that the roll 99 be heated, as by a gas jet 170.

In operation, let it be supposed that the hopper is filled with top lifts 49, it will be seen that the bottom lift will be held at its opposite sides or edges slightly raised at its rear by the stubby inclines 75 and the rear ends of this lift and adjacent lifts will be out of frictional engagement with the front wall 50 because of the recess 65, so that the projector hook 66 or plate 76 will be sure to engage positively the rear end of the small, thin top lift as it reciprocates forward under the action of its slide 71 and the connected parts 72, 82, 80, 83, 84 etc. Just as the forward end of this top lift nearly reaches the gate 87 the same rotary movement of the shaft 80 which moves the blank projector causes the arm 81 to engage the cam 88, Fig. 2, and Fig. 19 and thereby lift the gate out of the path of the inwardly moving blank. Likewise the top roll 4 is moved upwardly out of the way of the blank, this movement being accomplished through the rotation of the same shaft 80 and the action of its cam 93, see Fig. 14, on the parts 94, 95, 97, and as soon as the leading end of the blank gets just between the rolls 1, 4, the roll 4 closes down tight upon it in feeling position, whereupon, the trip 134 having been actuated, the feeling or detecting operation takes plate as in Patent No. 1,046,213, and is transmitted to the central adjusting or setting mechanism 16, 17, 19 and 141 by the connections 10, 11, 12, 13, 14, 15, Figs. 1, 3, 6, 7 and as the blank moves from under the gate 87 the latter drops and through the parts 127, 129, 131, 132 and 18, locks the said portion of the setting mechanism in its then adjustment. This adjusting and setting mechanism has set the cam stops 25 thereby controlling the gage roll 28 and hence the splitting operation, and has also by reason of the rigid arm 143 adjusted the pin 146 (and usually the sleeve 145) into proper position for the subsequent movement of the distributing chute 102 in accordance with the position of adjustment of the detecting mechanism as thus determined by the feeling or detecting operation on the blank. As the rolls 1 and 4 and the chain 2 feed the blank onward the front end of the blank engages the unlocking shoe 163, Figs. 1, 3 and 20, thereby depressing said shoe and through the parts 161, 164, 166, 167 and 148 unlocking the rack bar 149 (by the disengagement of its lock plate 150 and dog 160) and engaging the sleeve 145 so that the spring 155 or 158 instantly swings the chute 102 around to the blank delivering position which corresponds to the thinness determination

and setting of the parts thus far explained. The tendency to rebound is prevented by the spring 158 and the ratchet members 148, 167. As the blank continues onward it is engaged between the rolls 28, 29 and skived by the knife 31 being then grabbed by the positively driven roll 98 and the frictionally driven roll 99 and forcibly and positively ejected into the chute 102 to fall into the proper can, bag, or other receptacle 168. While the blank is being ejected the next blank is being fed in and while the first blank is falling and getting into its receptacle the fed-in blank is being detected and the detections are being transmitted to the setting mechanism, so that the latter has adjusted the right hand end of the adjusting and controlling mechanism of the distributor by the time it is practicable to adjust the distributor, and then this right hand end of the mechanism which has just been adjusted is locked and the left hand end thereof unlocked so that the two can be brought into complete adjustment by means of the springs 155, 158 and connections. In other words the parts are so coordinated that a maximum economy of time is made possible and therefore a high rate of speed in handling the small pieces of stock results. As the frictionally driven roll 99 is rotated by engagement with the blank being ejected its cam 103, Figs. 1–3, is thereby turned to swing the arm 104 outward and thereby through the connections 105, 106, 107, 108, 111, 113, and 114 release the movable clutch member 85, Figs. 1 and 5, to engage the constantly rotating member 86 and thereby through the parts 84, 85, 81, 82, 72, etc. start the blank feeding mechanism to repeat the cycle of movements already described.

While I have shown my invention applied to a machine especially designed for handling small pieces such as top-lifts, heel-lifts, taps, half-soles and the like, it is not limited thereto as it will be understood that it may readily be changed in dimensions to accommodate soles and other relatively long and large dried-out pieces. The inclusion of a splitting knife or means does not restrict certain of the claims to blank-evening, but is intended to include, for instance, such a splitter as in my application Ser. No. 577,700 filed July 26, 1922. Although the specific skiving means herein illustrated are blank evening means, the expressions skiving or splitting means, as used throughout the specification and claims, are used generically unless otherwise required by the context. Also I wish it understood that many of the separate mechanisms and various sub-combinations and rearrangements of parts as pointed out in the claims are separately within the spirit and scope of my invention and that I am not limited otherwise than defined in the following claims.

What I claim is:

1. A machine of the kind described, comprising means for automatically feeding successive blanks of uneven thicknesses, means for detecting the grade of said blanks according to their thickness, governing means to control the admission of blanks to the detecting means, skiving means to split the blanks in accordance with their respective thickness grades, means for sorting and distributing the split blanks in accordance with their respective thickness grades, and actuating means to actuate said governing means to admit a succeeding blank before a preceding blank has been distributed.

2. A machine of the kind described, having means for detecting successive blanks according to their thickness and setting means adjustable in accordance with the grade detection, combined with automatic operating mechanism responsive to the setting means to operate on the blanks as detected, including skiving means and distributing mechanism, a gate controlled by the position of a blank for locking said setting means against further detecting adjustment, and independent tripping means also controlled by the position of a blank for locking and unlocking said distributing mechanism.

3. In a machine of the kind described, grade determining mechanism for determining the thin spot among a plurality of spots of varying thickness in each of a plurality of uneven leather pieces, and evening mechanism to even the piece in accordance with the grade thus determined and adjustable in response to said grade determining mechanism, combined with a swinging, blank distributing, gravity chute automatically rotatable to predetermined delivering positions according to their thus determined grades, said distributing chute being controlled by said grade determining means and means actuated by the blank to cause the chute to swing to its delivery position out of time with the adjusting control of said evening mechanism.

4. A machine of the kind described, having, in combination, grade determining mechanism for determining the thickness to which a blank shall be split, an automatic feed for feeding successive blanks to said mechanism, splitting means, and sorting mechanism for receiving the successive blanks in accordance with the thickness thus determined and to which they have been split, said feeding mechanism being operable to feed in a blank while a preceding blank is being sorted.

5. In a machine of the kind described, grade determining mechanism for determining the thin spot among a plurality of spots of varying thickness in each of a plurality of uneven blanks, a splitting knife, and mechanism co-operating with said knife adjustable in response to said grade determining mech-

anism, combined with distributing mechanism for thereafter sorting the split blanks according to their said grades, said distributing mechanism including delivering means under control from said grade determining means but operated by the blank out of time with the adjusting control of said adjustable mechanism.

6. In a machine of the kind described, automatic skiving mechanism and automatic distributing mechanism actuated in accordance with the thickness of each blank, including a swinging blank distributing gravity chute automatically rotatable to definite predetermined delivering positions for the blanks, and automatic locking mechanism for locking said two mechanisms before and during the skiving of a blank and the distributing of a blank respectively.

7. A machine of the kind described, having means for detecting the grade of successive blanks according to their thickness, governing means to control the admission of blanks to the detecting means, skiving means to split the blanks in accordance with their grades as determined by the detecting means, a blank distributing chute adapted to deliver the skived blanks in accordance with their grades, and means operated by the blanks passing through the machine for actuating said governing means to admit a succeeding blank to the detecting means before a preceding blank has left the distributing chute.

8. A machine of the kind described, having means for detecting the grade of successive blanks according to their thickness, governing means to control the admission of blanks to the detecting means, skiving means to split the blanks in accordance with their grades as determined by the detecting means, a blank distributing chute adapted to deliver the skived blanks in accordance with their grades, and means located between the skiving means and the distributing chute and operated by the blanks passing through the machine for actuating said governing means to admit a succeeding blank to the detecting means before a preceding blank has left the distributing chute.

9. A machine of the kind described having, in combination, splitting means for splitting a series of blanks to different thicknesses, automatic means operated by each blank to govern the thickness to which it shall be split, and distributing mechanism arranged to cooperate with said splitting means to distribute the blanks and adjustable in response to said automatic means, and means actuated by the blank to cause the distributing means to move to its position of adjustment dissimultaneously with the adjustment of the splitting means.

Signed by me at Manchester, New Hampshire, this 27th day of July, 1922.

LEANDER A. COGSWELL.