Aug. 25, 1936. W. D. KIMBALL ET AL 2,052,513

CAN BOXING MACHINE

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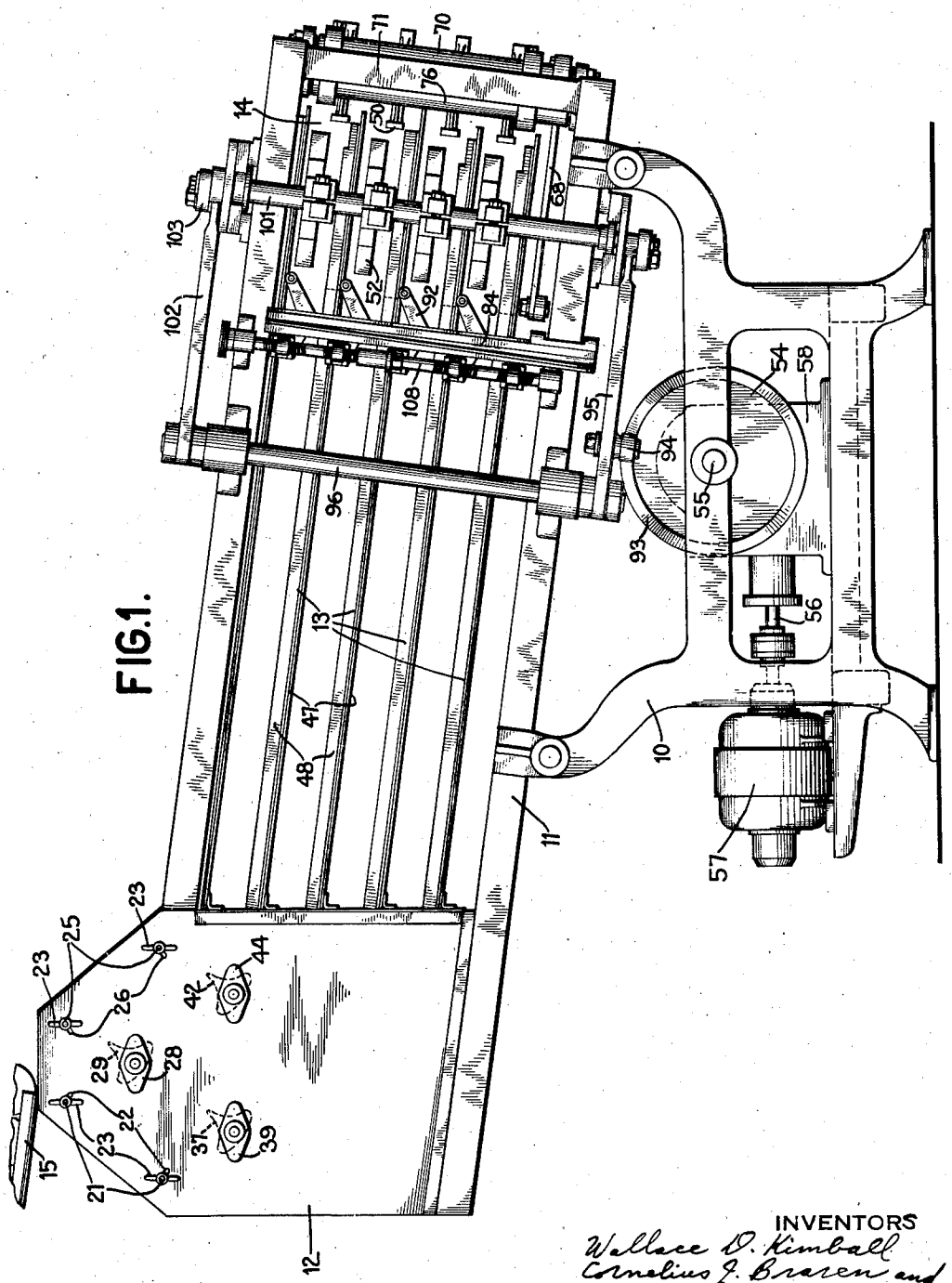


FIG. 1.

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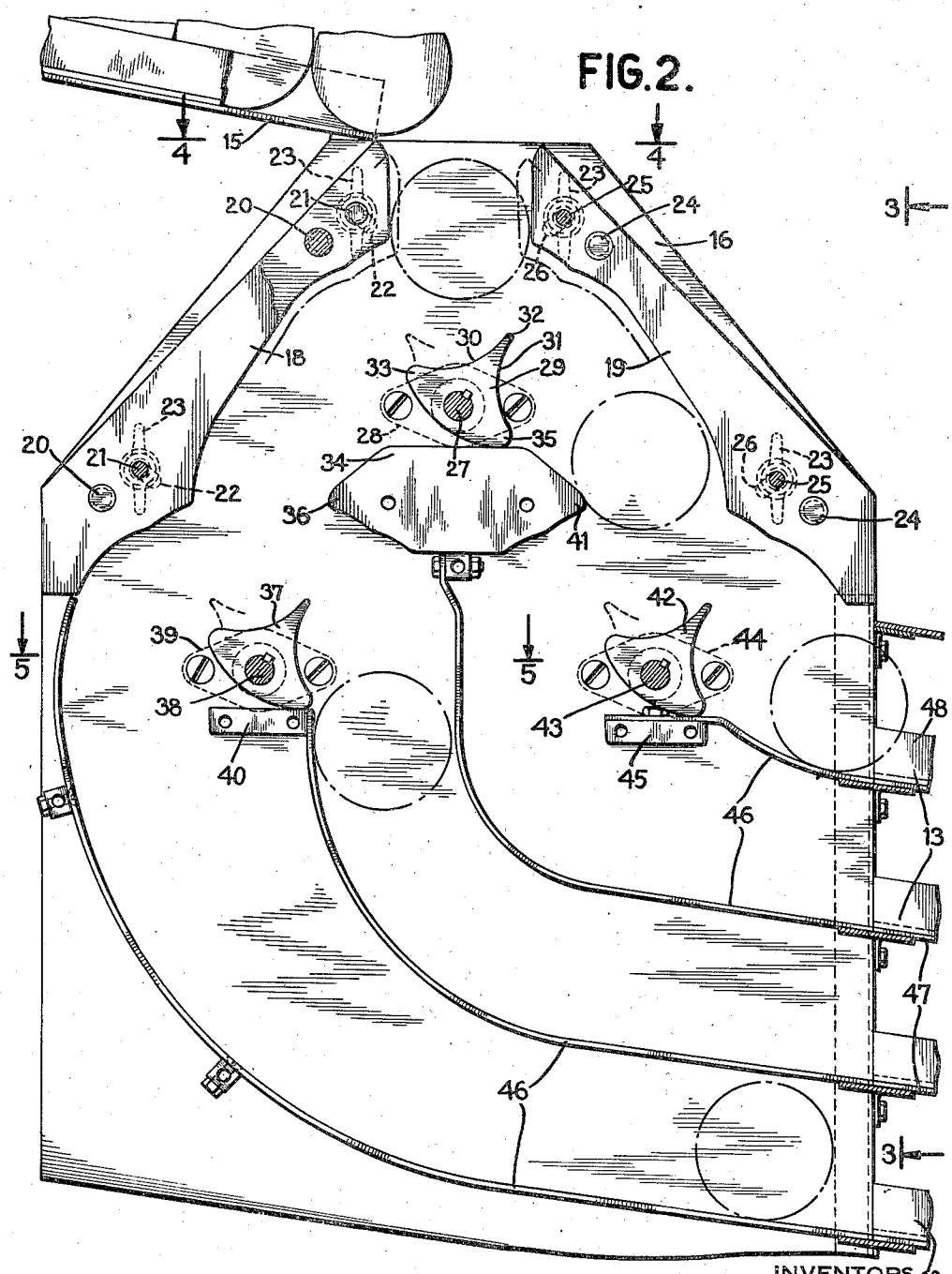
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CAN BOXING MACHINE

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FIG. 2.



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CAN BOXING MACHINE

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FIG. 3.

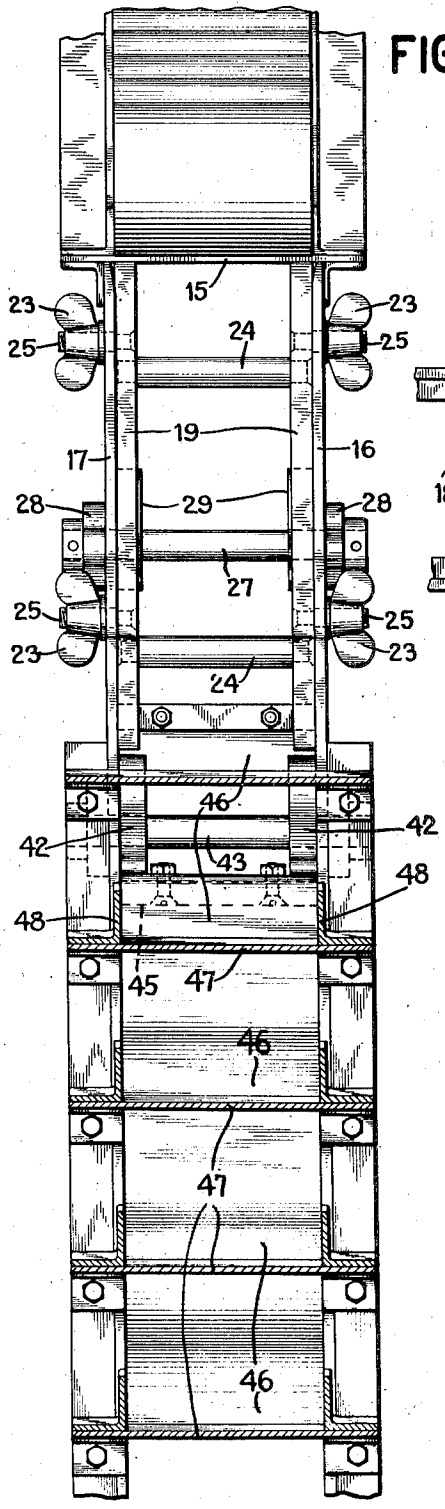


FIG. 4.

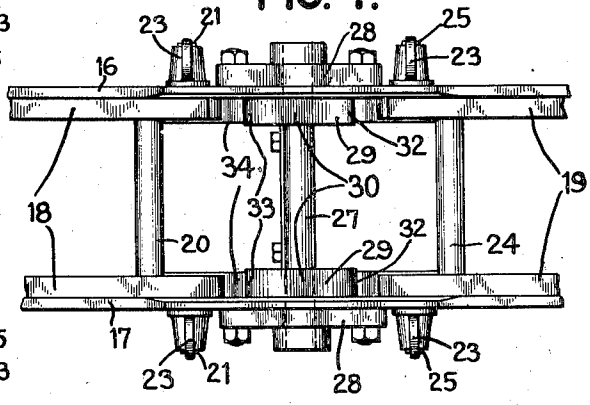
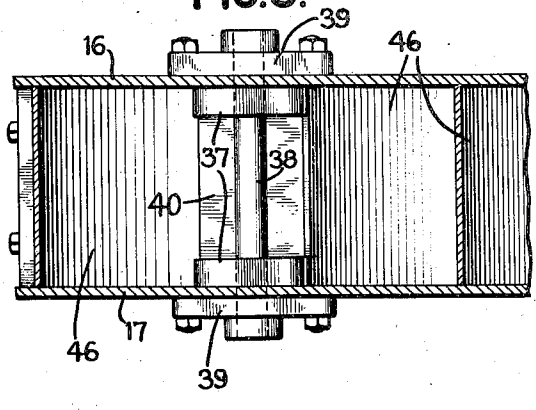


FIG. 5.



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CAN BOXING MACHINE

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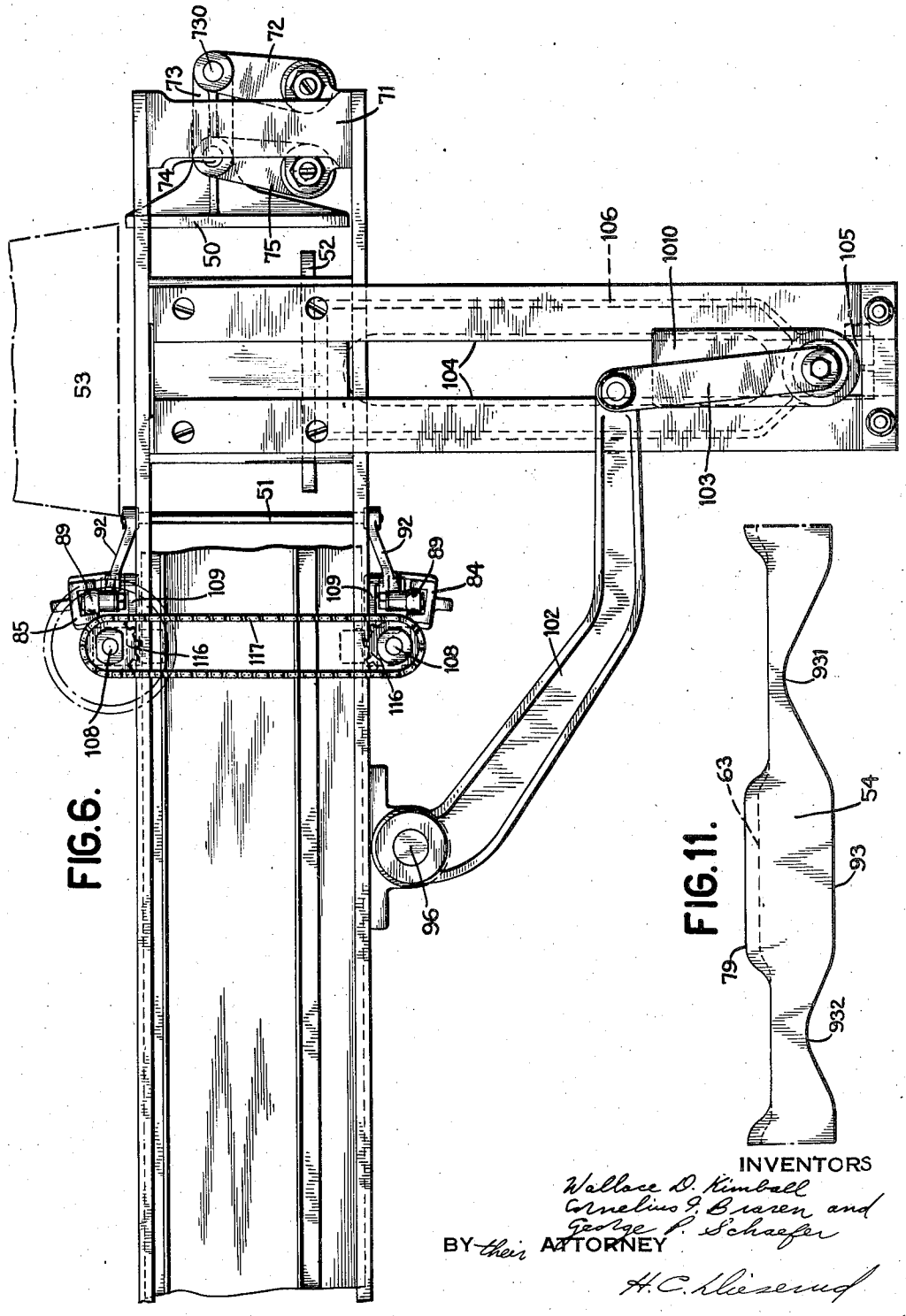


FIG. 6.

FIG. 11.

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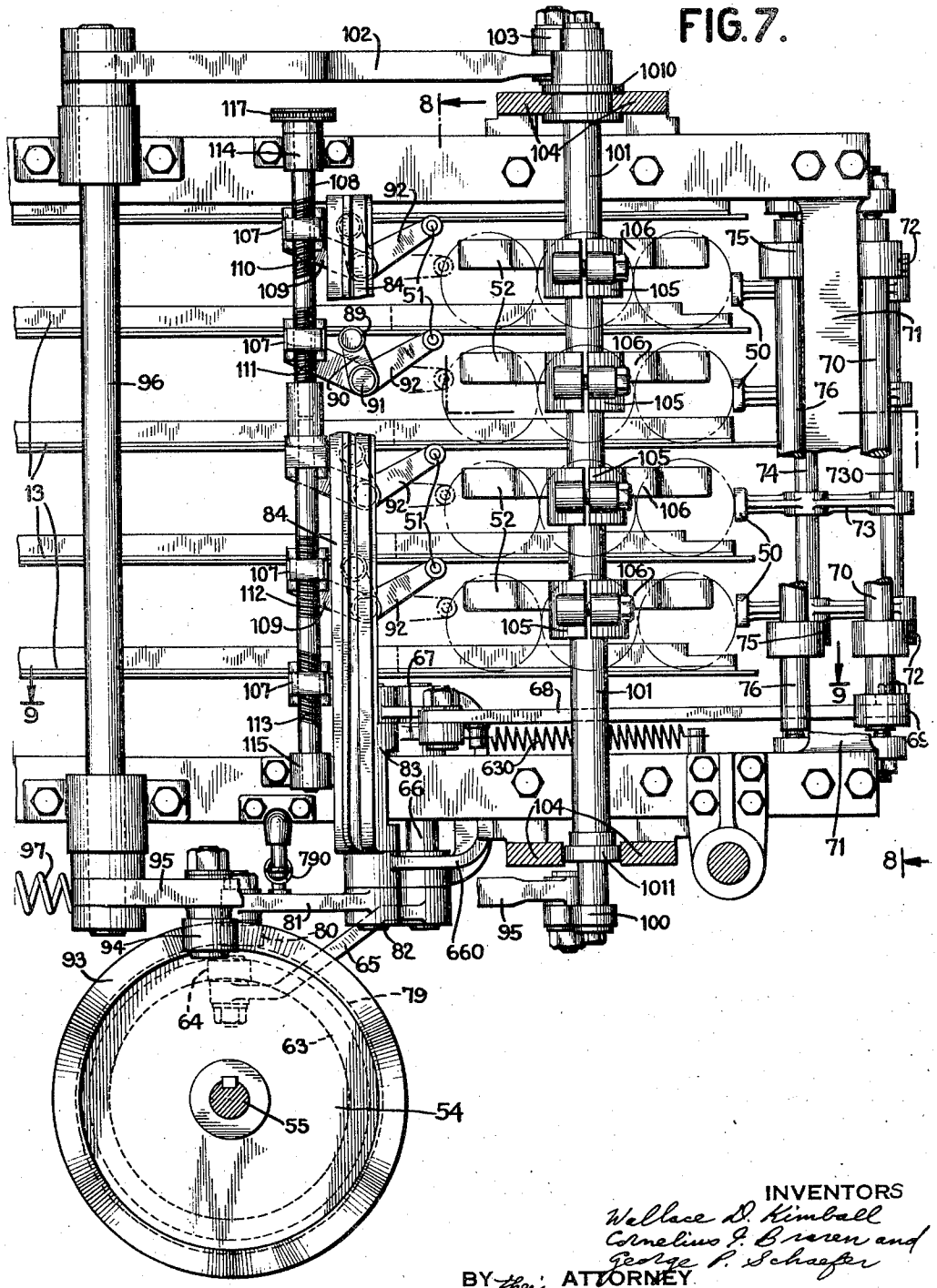
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CAN BOXING MACHINE

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FIG. 7.



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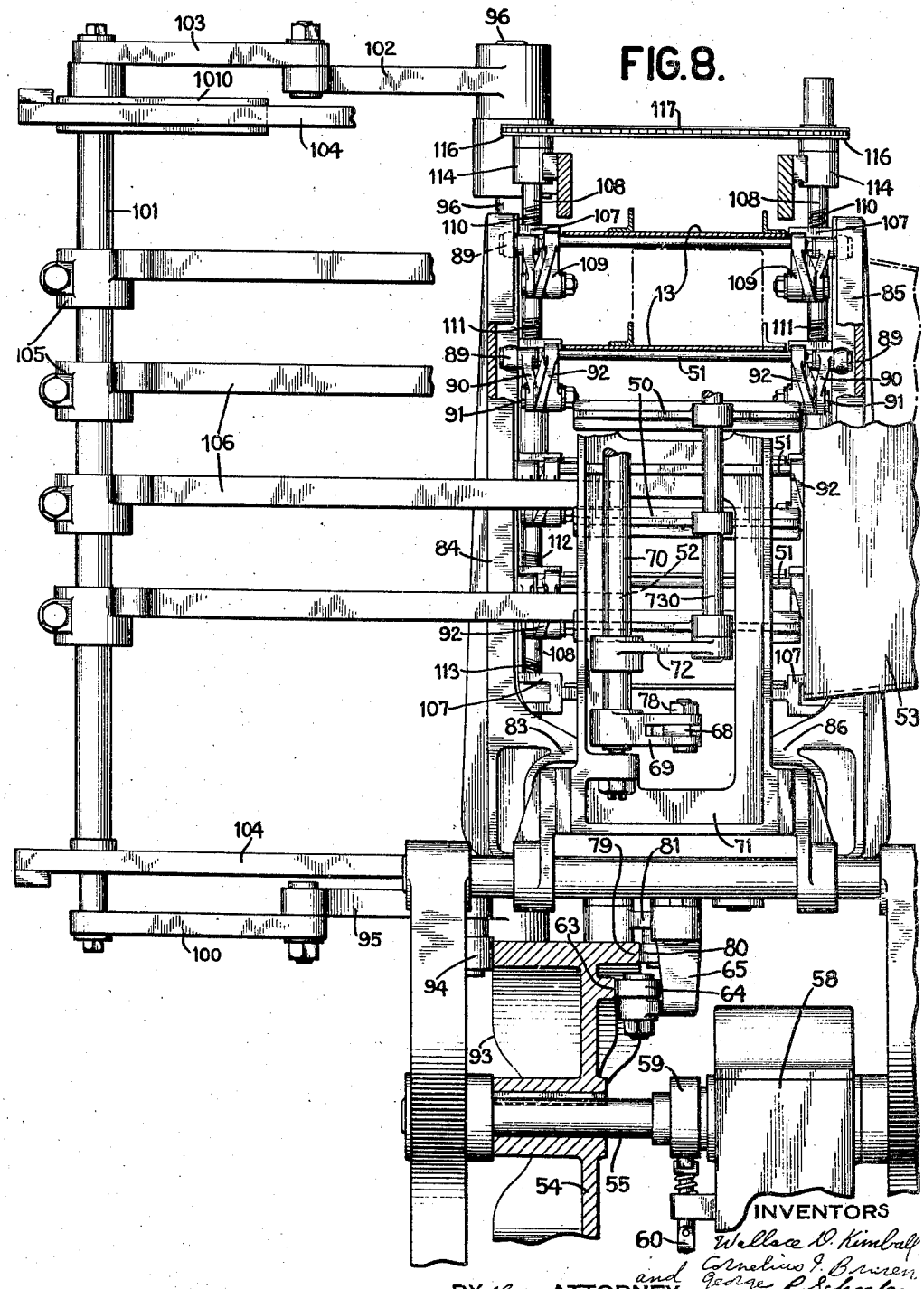
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CAN BOXING MACHINE

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FIG. 8.



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CAN BOXING MACHINE

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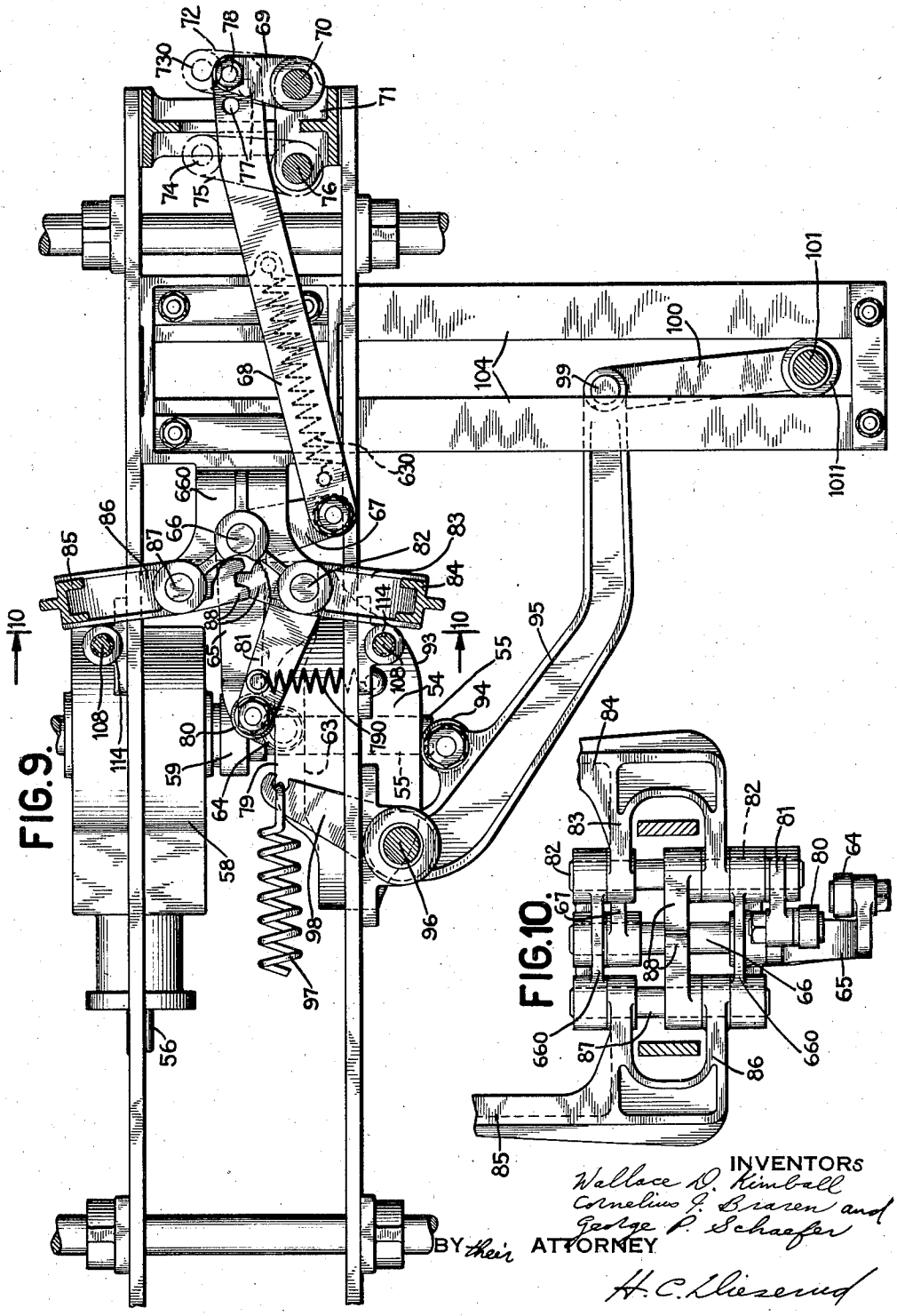


FIG. 9.

FIG. 10.

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Patented Aug. 25, 1936 2,052,513

UNITED STATES PATENT OFFICE

2,052,513

CAN BOXING MACHINE

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Application December 29, 1930, Serial No. 505,282

16 Claims. (Cl. 226—15)

This invention relates to machines capable of stacking canned goods or the like in suitable superposed rows or tiers and then forcing the cans into boxes or cartons of suitable size to receive a definite number of cans.

Machines of this general character constructed heretofore have been so designed that a number of cans in excess of that required for a single row have had to be introduced into the machine, before the cans for the next row above or below could be supplied. For example if it were desired to stack twelve cans in three rows of four cans each it would be necessary in the prior constructions to introduce a number of cans in excess of the twelve to be boxed in order to effect the desired stacking. Thus the first four cans of a batch fed into the machine would supply one of the rows, while the next group of between four and ten cans or more would not become a part of the stack then in the process of formation. The succeeding group of four cans would constitute a second row of the stack and there might be an additional group of cans entering the machine to fill up certain reserve storage spaces before the next series of four constituting the third row of the stack would be introduced. Thus the twelve cans, for example, which would be stacked for boxing would not be any twelve successive cans put into the machine but would be composed of groups of four cans separated by other groups of cans successively introduced into the machine. This is quite objectionable where the machine is used for the purpose of reboxing cans which have been stored away.

It is a common practice to store canned goods in unlabeled condition in cartons or boxes which are not sealed. When the goods are to be shipped for use they are passed through a labeling machine and then through a boxing machine again. Due to the different character of the goods stored in different lots it is highly desirable that the goods should be repacked in the same boxes or at least in the same order in which they are taken from the original boxes. This is not possible in the operation of can boxing machines heretofore known for the reasons already explained. Whenever a change in the character of the goods being boxed is met with it is necessary to remove the final cans of the preceding group and stack these by hand.

It has been an important object of the present invention to provide a can boxing machine which will stack the cans in the same order in which they are introduced into the machine. The arrangement is such, for example, that the first twelve cans put into the machine will be stacked in four rows of three cans each and introduced into the first box. Toward this end the machine includes the provision of means for separating or distributing the cans, as they are introduced, between a number of different channels corresponding with the rows to be formed. The means provided for this purpose is simple yet effective and completely reliable and is capable of performing its function at a speed greater than that at which the machine as a whole may be operated. This mechanism enables the efficient use of the machine in the reboxing of stored cans.

Another feature of the machine contemplated by the present invention is the provision of means permitting the use of the same distributing and stacking instrumentalities for the grouping of two stacks, of say twelve cans each, one in advance of the other and forcing these during one operation of the machine into a box of suitable dimensions. Heretofore in the boxing of cans in two layers it has been necessary to provide two separate stacking mechanisms placed side by side to form the two groups or stacks of cans or to operate the machine twice to separately introduce each layer into a box. The means provided in accordance with this invention for boxing two stacks of cans in a single operation is such that there is substantially no lost time due to the use of the same stacking devices and the operation is efficiently carried out.

Adjustability of the various portions of the machine to adapt it readily to the handling of cans of various diameters is another feature of the invention. The construction for this purpose is such that the opening through which the cans are introduced into the separating or distributing mechanism and the width of certain channels in this mechanism, may be varied to insure proper operation of this mechanism in the handling of different sized cans. Means are also provided for adjusting the runways which deliver the cans into the stacking chamber or portion of the machine and for adjusting certain detents and stops associated with this portion of the machine.

Other features and advantages of the construction contemplated by the present invention will appear from the detailed description of an illustrative form of the invention which will now be described in detail in conjunction with the accompanying drawings, in which:

Figure 1 is a side elevation of the complete machine.

Figure 2 is a vertical, longitudinal section taken

through the separating or distributing portion of the machine.

Figure 3 is a transverse, sectional view taken along the line 3—3 of Figure 2.

Figure 4 is a horizontal, sectional view of a detail taken along the line 4—4 of Figure 2.

Figure 5 is a horizontal, sectional view taken along the line 5—5 of Figure 2.

Figure 6 is a plan view partly in section of the stacking chamber or portion of the machine disclosing the runways leading thereto.

Figure 7 is a side elevational view of the stacking portion of the machine with certain parts broken away, illustrating certain detents and stops, as well as the pushing devices used in forcing the cans into the boxes.

Figure 8 is a vertical, sectional view on line 8—8 of Fig. 7 showing the construction at the stacking and boxing end of the machine.

Figure 9 is a horizontal, sectional view taken along the line 9—9 of Figure 7.

Figure 10 is a sectional view disclosing a detail and is taken along the lines 10—10 of Figure 9, and

Figure 11 is a diagram illustrating the development of certain cam faces.

Referring now to the drawings, the machine may comprise a suitable frame structure 10 adapted to support all of the various portions of the machine at a suitable height above the ground. This frame may be provided with upstanding arms having mounted thereon at an appropriate inclination to the horizontal a base or frame structure 11. At the high or left end of this structure, as shown in Figure 1, there is provided the distributing or separating mechanism designated generally by the reference character 12. Suitable inclined runways or tracks 13 leading from the discharge end of the distributing mechanism serve to convey the cans to the stacking chamber or portion of the machine, generally designated by the reference character 14. The cans to be stacked and boxed may be supplied to the machine in any suitable way, as by means of an inclined runway 15 above the distributing mechanism.

Figures 2 to 5 disclose the details of the construction of the separating or distributing mechanism. This mechanism may be suitably enclosed by a pair of side plates 16 and 17 which are joined by various cross rods and shafts, to be referred to hereinafter. Between these side plates, which are spaced a slightly greater distance than the normal height of the cans to be handled by the machine, are adjustably mounted pairs of guide elements 18 and 19. The guides 18, one of which is adjacent each of the side plates 16 and 17, may be joined and held suitably spaced by means of rods 20 riveted or otherwise secured to the guides. The spacing of the latter may be such as to place them in close proximity to the side plates or they may be separated slightly therefrom. In a machine intended to handle filled cans the guides are preferably held close to the side plates so that the beads of the cans will engage or roll upon the edges of the guides. On the other hand where the machine is intended to handle empty cans it is preferable to permit the bead at the bottom of the can to fit between the guide and the adjacent side plate. Guides 18 may be adjustably supported by the side plates through the use of bolts or studs 21 riveted or otherwise secured to one of the guides and adapted to extend through elongated openings 22 in the side plate 16. A wing nut 23 may be provided for each of the bolts 21 and will serve to hold the two ends of the guides in any desired position of adjustment. One extreme position of the guides is shown in full lines in Figure 2 and the other extreme position is shown in dotted lines in this figure. In a similar way the pair of guides 19 may be joined by a pair of rods 24 and may be adjustably supported by studs or bolts 25 riveted or otherwise secured to one of the guides and adapted to pass through elongated openings 26 in the side plate 16. Wing nuts 23 may be provided on the bolts 25 for clamping the guides in any adjusted position between the full and dotted lines indicated in Figure 2.

By proper adjustment of the pairs of guides the opening at the top of the distributing mechanism as well as the channel formed in part by the guides may be varied to a suitable extent to accommodate cans of various diameters. The adjustment of the guides should be effected in such a way that the opening will at all times be substantially centrally disposed. This opening, furthermore, should be of such size as to permit the cans to drop freely through it but should not be so large that any considerable lateral movement of the can within the opening is permitted, since such a movement would be apt to cause a binding of a pair of cans between certain devices below the opening and the walls of the opening.

Directly beneath the opening provided between the guides 18 and 19 there is mounted a shaft 27 which may be suitably supported by a pair of bearing elements 28 secured in any suitable way to the outer sides of the plates 16 and 17. The shaft 27 may have keyed or splined thereto a pair of elements 29 in the form of a portion of a star wheel, one of these elements being placed adjacent each of the side frames 16 and 17 and being either in contact therewith or spaced slightly therefrom depending upon whether the machine is intended to handle filled or empty cans. The elements 29 are provided with a pair of curved surfaces 30 and 31 which are suitably inclined toward the point 32 of a star wheel construction. When the elements 29 are in the position shown in Figure 2, a can dropping through the opening between the guides 18 and 19 will strike the surfaces 30 and due to the slope of these surfaces and the relation of the center of gravity of the can with respect to the shaft 27, the members will be rocked about their pivots until the extensions 33 engage the upper surfaces of plates 34 secured to the side plates 16 and 17. As a result of this operation the can in question will be directed into the channel formed in part by the guides 18. The succeeding can passing through the opening between the guides 18 and 19 will then strike the curved surfaces 31 of the elements 29 and will cause these elements to be rocked in a clockwise direction until the projections 35 strike the upper surfaces of the plates 34, being then again in the position shown in full lines in Figure 2. In the course of this rocking movement of the elements 29 the second can will be directed toward the guide 19. The elements 29 thus provide a means for dividing or distributing the cans, fed continuously through the opening, alternately into channels at the left and right of these elements.

The cans which are delivered to the left of the elements 29 slide over extensions 36 of the plates 34 and drop into contact with one or the other of a pair of curved surfaces on star wheel elements 37 which are similar in all respects to the elements 29. The elements 37 are carried by a

shaft 38 mounted in bearing members 39 secured to the side plates. The action of the elements 37 is precisely the same as that of the elements 29, they being rocked about their pivots until their lateral wings or extensions engage plates or brackets 40 secured to the side plates. It will be apparent that through the provision of the elements 37 a further separation of the cans between two additional channels is provided. In a similar way a further separation of the cans directed toward the right of the elements 29 is effected. These cans roll over the ends 41 of plates 34 and drop into engagement with one or the other of the pairs of curved surfaces carried by star wheel elements 42. These elements are keyed to a shaft 43 suitably mounted in bearings 44 secured to the side plates. The rocking movements of the elements 42 are limited in each direction by engagement of lateral wings or extensions thereof with plates or brackets 45 secured to the side plates.

Suitable channels to receive the cans as they are distributed or divided between the four lanes to the left and right of the shafts 38 and 43, respectively, are formed by guide strips or plates 46 secured in any suitable way to the side plates of the mechanism. The guide strips 46 terminate directly in line with the inclined runways 13 and serve to deliver the cans to these runways. It will be clear that through the provision of the three sets of star wheel or divider elements 29, 37 and 42, in the manner explained, each successive group of four cans will be distributed between the four separate runways 13. As illustrated in Figure 3, these runways may comprise a bottom plate 47 and side angle members 48 having their vertical legs suitably spaced a slight distance greater than the height of the cans handled by the machine.

As the cans are discharged to the runways 13, they are fed by gravity to the lower or right-hand end of the machine, as shown in Figure 1, which constitutes the stacking chamber and boxing portion of the machine. Here the cans are arrested by a series of stops 50, one of which is provided for each of the rows of cans. These stops, as will be presently explained, are only temporarily held in the position shown in Figure 1 and at the proper time are withdrawn to permit the cans to shift a slight distance further toward the end of the machine. At the same time a series of detents or divider bars 51, one related to each of the runways, will be rocked downwardly in synchronism with or preferably slightly in advance of the withdrawal of the stops 50 to engage the lowermost can on each runway and hold it back to produce a separation between the cans to be boxed and those remaining on the runways. This construction is for the purpose of avoiding the tearing of the labels on the cans, which would arise from the relative longitudinal movement between those being shifted and the adjacent stationary cans. At the appropriate time the cans which have been properly lined up for boxing are forced by means of a pusher 52 into a funnel 53 over or adjacent to which is placed the open end of the box or carton into which the cans are to be loaded.

The operating mechanism for causing the withdrawal of the stops 50, the operation of the detents 51 and the shifting of the pushers 52 will now be described. This mechanism, as will be pointed out, is so constructed and controlled that during a single cycle of operation of the machine the stops and detents are operated twice while the pusher is given two operations of different magnitude. The first operation of the pusher, following the release of the tripping mechanism provided, serves to force two stacks or groups of cans placed end for end into the box. In the machine illustrated this will mean the boxing of twenty-four cans stacked in two groups, end for end, of four rows of three cans each. For this purpose the pusher is given its full or long stroke. Subsequently after a new set of cans has been fed into the stacking chamber of the machine, the pusher is given its second or short stroke which serves merely to force the single stack of cans into the funnel. The parts are then restored to normal position so that a new stack of cans may be formed within the stacking portion of the machine and this new stack, together with the stack already in the funnel, will then be forced into another box at the beginning of the next operation.

Referring now to Figures 1 and 8, the means for operating the stops, detents and pushers comprises a large cam 54 having camming projections extending axially from its opposite faces. This cam is carried by a shaft 55 journalled in the side frames 10. The shaft 55 is in turn driven, through a suitable clutch connection, by a shaft 56, connected with an electric motor 57. The connection between the shafts 55 and 56 is made through suitable reduction gearing enclosed in a housing 58 and through a one-revolution clutch 59 of any suitable form, the construction being such that under the control of a foot pedal, or any other suitable form of control mechanism, the cam 54 may be given a single revolution at will. The foot pedal, or similar control device, not shown, is disposed conveniently beneath the funnel 53 where it may be tripped by the operator of the machine whenever he is ready to have the cans forced into a box, or the clutch may be tripped automatically upon application of a box to the funnel. The pedal may be connected by a link 60 to any suitable mechanism for tripping the clutch to permit the shaft 55 to be driven through one revolution at the end of which it will be automatically stopped until the clutch is again tripped.

For the purpose of operating the stops 50, the cam 54 is provided with an axially extending camming projection 63 adapted to cooperate with a roller 64 carried by an arm 65 secured to a shaft 66 suitably mounted in a bracket 660 supported by the framework of the machine. A spring 630 serves to rock shaft 66 and the arm 65 to maintain the roller 64 in engagement with the surface of the cam. Also secured to the shaft 66 is an arm 67 which is connected by link 68 to a shaft 70 mounted in a bracket 71 carried by the framework of the machine. A pair of arms 72, also secured to the shaft 70, carries a rod 730 which forms a pivotal connection between the arms and a rearward extension 73 of each of the stops 50. The extensions 73 are also pivotally connected by means of a rod 74 to a pair of arms 75 pivotally supported by means of a shaft 76 carried by the bracket 71. The shafts 70 and 76, as well as the rods 730 and 74 by which the arms 72 and 75 are connected to the stops 50, may extend vertically to a sufficient extent to carry and operate all of the detents simultaneously. Due to the parallel link construction provided the stops 50 will be moved in such a way as to maintain their forward faces in a plane constantly parallel to that shown.

In order to provide for adjustment of the po-

sition of the stops to maintain cans of different diameters in proper relation to the pushers, the link 68 may be provided with a series of holes 77, three being shown, any one of which may be used in pivotally connecting the link by means of a bolt 78 to the arm 69. In this way the normal position of the stops may be varied to suit the requirements. As already indicated, the cam 63 is of such form as to cause the stops to be withdrawn twice during each operation of the machine at the appropriate time prior to the operation of the pushers.

For the purpose of operating the detents or dividers 51, a second axially extending cam formation 79 is provided on the element 54. This cam formation is adapted to cooperate with a roller 80 carried by an arm 81 secured to a shaft 82 mounted in the bracket 660. A spring 790 serves to rock the arm to maintain the roller 80 in constant engagement with the surface of the cam 79. Mounted on the shaft 82 and adapted to rotate therewith is a yoke 83 having an upwardly extending bar 84 of channel form. A similarly formed bar 85 is vertically disposed at the opposite side of the machine and is provided with a yoke 86 secured to a shaft 87. The two shafts 82 and 87 are adapted to be oscillated in unison but in opposite directions, angularly, by virtue of the interengagement of segments 88, one of which is secured to each of the shafts. Cooperating with the channels of the bars 84 and 85 are a series of rollers 89 carried by arms 90 pivotally mounted on pins or studs 91. The arms 90 are portions of bell crank levers having arms 92 which are adapted to support the opposite ends of the series of detent rods 51, as best shown in Figure 8. A bell crank 90, 92 is provided at each end of the detents 51.

It will be apparent that as the channel bars 84, 85 are shifted toward the right in Figures 6 and 9, the bell cranks will be rocked in unison in a clockwise direction to lower the detents into the path of the cans on the runways 13. This downward movement of the detents will take place twice during each cycle of the machine, due to the form of the cam 79, and it will be so timed as to occur substantially in unison but preferably slightly in advance of the withdrawal of the stops 50. When the detents are lowered the cans to the left of the same, as viewed in Figure 7, will be held against further movement along the runways and may even be cammed slightly up the runways. As the withdrawal of the stops 50 is then continued, a separation will be effected between the three cans in each row which are in line with the pushers and the remaining cans on the runways.

The means for operating the pushers comprises a cam formation 93 extending axially from the opposite side of the element 54 from the cam formations 63 and 79. A roller 94 carried by an arm 95 secured to a shaft 96 is held in contact with the surface of the cam formation 93 by means of a spring 97 which is attached at one end to a fixed portion of the machine and at its opposite end to an arm 98 secured to the shaft 96. At its free end the arm 95 is connected to a bolt or stud 99 with an arm 100 pivotally connected with a vertically extending shaft or rod 101. This shaft at its upper end is connected by a similar system of links to the shaft 96. For this purpose an arm 102 is secured to the shaft 96 and is connected by a stud or bolt to an arm 103 pivotally connected to the upper end of the shaft 101. As the arms 95 and 102 are rocked about the axis of the shaft 96, the shaft or rod 101 is drawn bodily toward the stacking chamber of the machine and in its movements is guided by means of suitable guide elements 104 arranged adjacent both the top and bottom of the shaft. At its upper end the shaft 101 may have secured thereto a shoe 1010 which has grooves along its side edges adapted to engage and slide along the edges of the guides 104. This arrangement will prevent turning of the shaft as it is shifted by the arms 100 and 102. A similar construction may be provided at the lower end of the shaft 101, if desired, or a roller or collar 1011 may be provided at this end to ride between the guides 104. Secured to the shaft or rod 101, as by means of split collars 105, are a series of yokes 106 which carry at their forward ends the pushers 52. The yokes 106 are suitably spaced along the rod 101 to place the pushers 52 in line with the cans to be forced into the funnel 53 and into the box. They may be adjusted to any desired elevation by unclamping the split collars. As previously mentioned, the cam 93 is adapted to give to the arm 95 and to the pushers both a long or complete stroke and a short or half stroke during each operation of the machine. For this purpose the cam surface is provided with a deep depression or dwell 931 and a shallow dwell 932 appropriately situated with relation to the normal position of the cam. The relation of the various cam surfaces on the cam 54 is such that at the beginning of an operation of the machine the detents 51 are lowered and the stops 50 are withdrawn. The pushers 52 are then given their long or full stroke to force two stacks or groups of cans into a box. The detents and stops remain in their lowered and withdrawn positions throughout the operation of the pusher. During the continued operation of the machine, after the pusher has been restored to its normal position the detents and stops are also restored and a new stack of cans is formed in the stacking chamber. Subsequently the stops 50 and detents 51 are again operated and the pushers 52 again shifted to force the newly formed group or stack of cans into the funnel 53 in readiness for the next operation of the machine. By timing the operations in this way the attendant may trip the clutch mechanism whenever he has a box in readiness to receive the cans from the funnel 53. While he is then preparing for the application of a new box to the funnel, the machine will continue its operation to store the first stack or group of cans in the funnel. In order to facilitate the operation of the machine by a single attendant suitable means, forming no part of the present improvements, may be provided for holding the boxes in position during the loading operation and for lowering or discharging them after they have been loaded. This leaves the operator free to attend to the preparation and application of the boxes to the funnel.

In order to adapt the machine to more readily handle cans of different diameters, provision is made for varying the positions of the ends of the runways 13 which are located in and adjacent the stacking chamber of the machine. It is desirable to reduce as far as possible the amount of separation between the cans in the various rows as they stand in the stacking chamber. Any separation between the rows at this point must be eliminated as the cans are forced into the funnel 53 by the dropping of the upper rows of cans and it is desirable to reduce this movement to a minimum. In the adjustment of the runways 13, provision is made for raising the lower runways at the same

time that the upper runways are lowered so as to bring about a convergence between the upper and lowermost runways. To effect the adjustment, each runway, as well as the upper guide above the top row of cans, is supported adjacent the detents 51 by means of a bracket 107 which is carried by a rod 108. Each of these brackets has an arm 109 which carries the pivot 91 for the bell cranks 90, 92. The intermediate one of the five brackets 107 is supported by the rod 108 at a fixed elevation but the runways and guide above and below the central runway are adjustable toward and away from the latter. For this purpose the rod is provided with a series of threads 110, 111, 112 and 113. The threads 110 and 111 may be righthand threads, for example, while the threads 112 and 113 are lefthand or of opposite sense to the upper threads. Furthermore, the threads 110 and 113 are double or are of greater pitch than the threads 111 and 112; therefore, as the shaft or rod is rotated, the threaded engagement between the various series of threads and the brackets 107 will cause the two uppermost brackets to move downwardly and the two lowermost brackets to move upwardly and vice versa, depending upon the direction of rotation of the shaft 108. Furthermore, the rate of advance toward or recession from the central runway for the uppermost and lowermost brackets will be double, or at least materially greater than that for the two brackets adjacent the central bracket. At its upper and lower ends the shaft 108 is suitably supported by bearings 114 and 115, respectively. It will be understood that a rod 108 and a series of brackets 107 will be provided on each side of the runways and adjustment of the two sides should be effected in unison to maintain the runways in proper planes. To insure uniform adjustment of the two shafts, they may be provided with sprocket wheels 116 connected by a chain 117, and either shaft may have a handwheel at its upper end or be adapted to receive a wrench. The funnel 53 may be supported in any suitable way by the framework of the machine and may be replaced by funnels of different sizes when different sized cans and boxes are used.

The intended mode of operation of the machine has been sufficiently fully set forth in connection with the detailed description of the various portions of the same so that a general résumé of operation is believed to be unnecessary. While an illustrative form of the invention has been set forth in considerable detail, it is to be understood that various changes and modifications may be made in the construction of the parts and the arrangement disclosed without departing from the general spirit and scope of the invention as defined by the claims. Certain of the features of the invention may be adapted for use independently of other features. While the machine as disclosed herein is adapted to provide two operations of the pusher and other parts during a single operation of the machine so that two stacks or groups of cans will be simultaneously forced into a box, this construction may be varied whenever desired to provide for only a single, preferably long, operation of the pusher during each operation of the machine so that only a single group will be boxed at a time. Similarly, the number of rows of cans and the number of cans in each row to be forced into a box at one time may be varied to suit conditions.

What we claim is:

1. In a machine of the class described means for stacking cans in a plurality of rows arranged one above the other, means for shifting said cans in the direction of their axes, and an operating mechanism for said machine adapted to operate said shifting means twice and to different extents during a single cycle of operation.

2. In a machine of the class described means for stacking cans in a plurality of rows arranged one above the other, means for shifting said cans in the direction of their axes, and an operating mechanism for said machine adapted to operate said shifting means twice and to different extents during a single cycle of operation, said first mentioned means forming a stack of cans between each operation of said shifting means.

3. In a machine of the class described means for stacking cans in a plurality of rows arranged one above the other, means for shifting said cans in the direction of their axes, a main operating mechanism, and connections from said operating mechanism for giving a partial and a complete operation to said shifting means at different periods of a single operation of said mechanism.

4. In a machine of the class described means for stacking cans in a plurality of rows arranged one above the other, means for shifting said cans in the direction of their axes, a main operating mechanism, and connections from said operating mechanism for giving a partial and a complete operation to said shifting means at different periods of a single operation of said mechanism, the complete operation being given to said shifting means prior to the partial operation during a cycle of said operating mechanism.

5. In a machine of the class described means for stacking cans in a plurality of rows arranged one above the other, means for shifting said cans in the direction of their axes, means for storing a group of stacked cans, and means for operating said shifting means different extents to first shift a group of cans axially from said stacking means into said storing means and subsequently shifting said group together with another group into a box.

6. In a machine of the class described means for stacking cans in a plurality of rows arranged one above the other, means for shifting said cans in the direction of their axes, means for storing a group of stacked cans, and means for operating said shifting means to first shift a group of cans from said stacking means into said storing means and subsequently shifting said group into a box, said stacking means being operable to form a second group of cans in line with the stored group of cans between the operations of said shifting means, whereby two groups of cans will be simultaneously shifted into a box.

7. In a machine of the class described means for stacking cans in a plurality of rows arranged one above the other, means for shifting said cans in the direction of their axes, means for storing a group of stacked cans, an operating mechanism adapted to be released for a single cycle of operation, and connections from said mechanism for operating said shifting means near the end of one cycle of operation to shift a group of cans into said storing means, and for operating said shifting means during the next cycle of operation to shift said group of cans from said storing means into a box.

8. In a machine of the class described means for stacking cans in a plurality of rows arranged one above the other, means for shifting said cans in the direction of their axes, means for storing a group of stacked cans, an operating mechanism adapted to be released for a single

cycle of operation, and connections from said mechanism for operating said shifting means near the end of one cycle of operation to shift a group of cans into said storing means, and for operating said shifting means during the next cycle of operation to shift said group of cans from said storing means into a box, said stacking means being operable to form a second group of cans in line with the stored group of cans between the operations of said shifting means, whereby two groups of cans will be simultaneously shifted into a box.

9. In a machine of the class described a plurality of spaced superposed can supports and means for adjusting said supports to reduce or increase the spacing between the same at will, said means comprising devices for simultaneously raising certain of said supports and lowering others.

10. In a machine of the class described a plurality of spaced superposed can supports and means for adjusting said supports to reduce or increase the spacing between the same at will, said means serving to simultaneously shift the supports at opposite sides of a substantially horizontal median plane through the same in opposite directions.

11. In a machine of the class described a can stacking chamber, means for delivering cans in rows into said chamber, stops at the end of said chamber for arresting the cans delivered thereto, detents adapted to prevent the movement of cans into said chamber, means adjustably connected with said stops to withdraw the same, a main operating mechanism, and a cam for simultaneously operating said last mentioned means and controlling the movement of said detents twice upon each cycle of operation of said main operating mechanism.

12. In a machine of the class described a can stacking chamber, a plurality of superposed runways for delivering cans into said chamber, pivoted detents adjacent the ends of said runways for arresting the cans thereon, means for adjusting the elevation of said runways and the pivots of said detents, and means including a channel bar adapted to cooperate with all of said detents regardless of their elevational adjustment to simultaneously rock the same into and out of can arresting position.

13. In a machine of the class described a can stacking chamber, a plurality of superposed runways for delivering cans into said chamber, pivoted detents adjacent the ends of said runways for arresting the cans thereon, means including a channel bar adapted to cooperate with all of said detents to simultaneously rock the same into and out of can arresting position and means for varying the spacing between said runways to accommodate cans of different diameter, said last mentioned means serving also to shift the pivots of said detents.

14. In a machine of the class described a distributor having an adjustable opening for the reception of cans of different sizes, a plurality of spaced superposed runways adapted to receive the cans from said distributor, said runways delivering said cans into a stacking chamber, and means for varying the spacing between the delivery ends of said runways by simultaneously shifting certain of the same in opposite directions to accommodate cans of different sizes.

15. A machine of the character described comprising a can-holding rack adapted to receive and hold a plurality of cans for ejecting into a case, an ejector mounted for reciprocable movement in the rack for ejecting the cans, power means for operating said ejector, and controlling means for giving said ejector short and long strokes whereby a row of cans is moved forward in the rack upon a short stroke and ejected upon a long stroke.

16. In a machine of the class described a can stacking chamber, a plurality of superposed runways for delivering cans into said chamber, detents adjacent the ends of said runways for arresting the cans thereon, the said detents each having an actuating member movable longitudinally of said runways, an operating member extending vertically of said superposed runways and having a longitudinally extending channel, the said actuating members being disposed in said channel and engaging the walls thereof, and means for moving said operating member longitudinally of said runways to cause the simultaneous actuation of said detents.

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