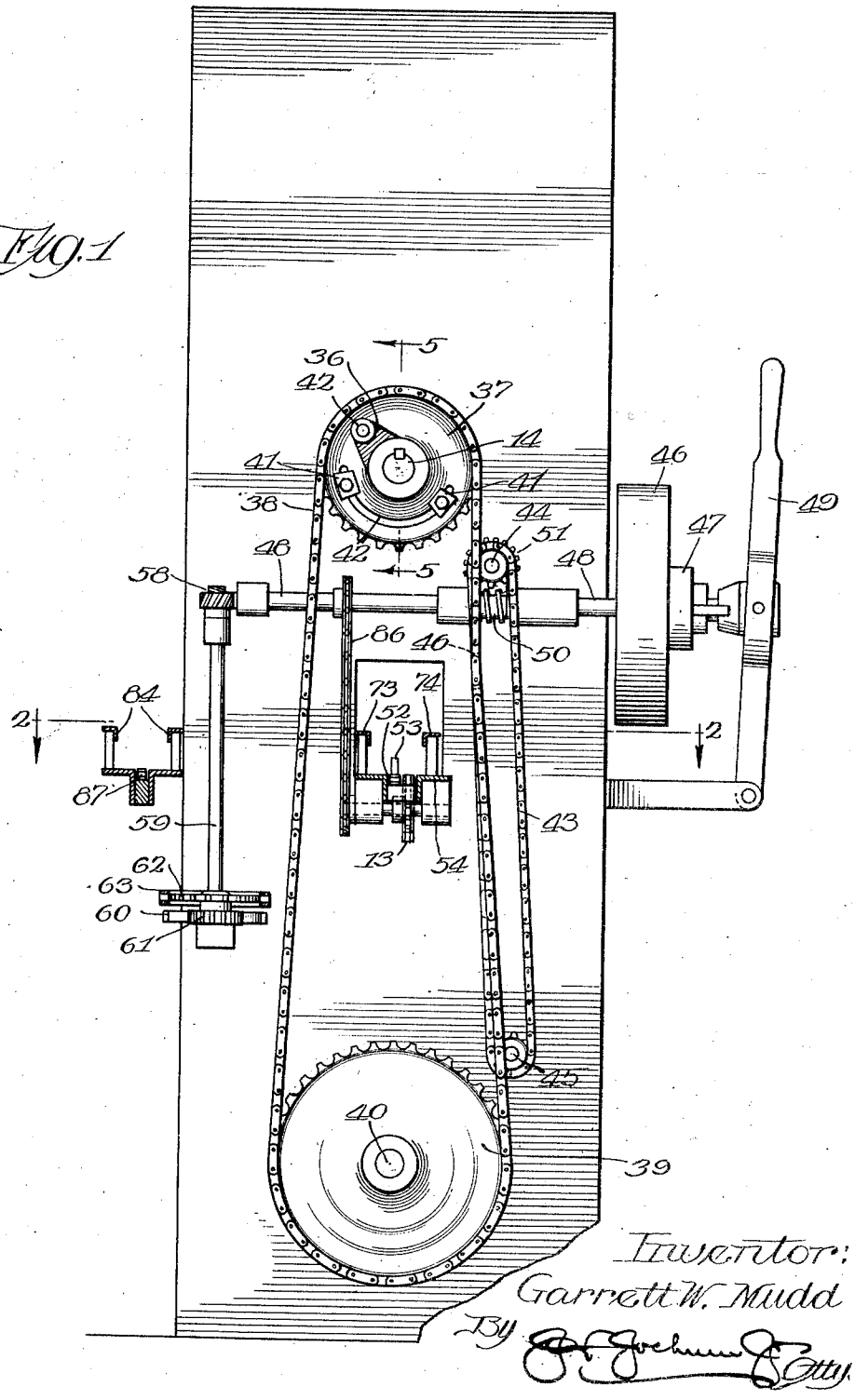
May 14, 1929. G. W. MUDD 1,712,775

FILLING MACHINE

Filed Sept. 30, 1925 5 Sheets-Sheet 1

Fig. 1



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May 14, 1929. G. W. MUDD 1,712,775

FILLING MACHINE

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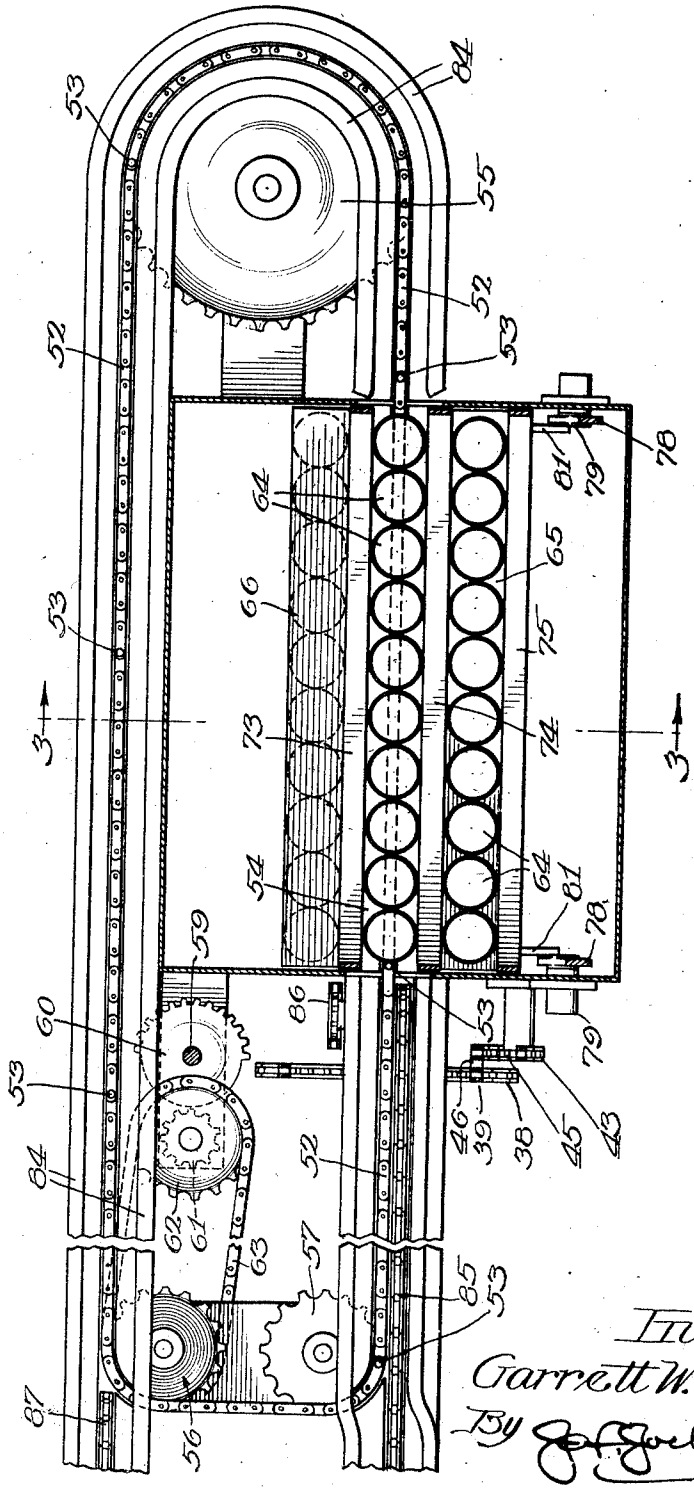


Fig. 2

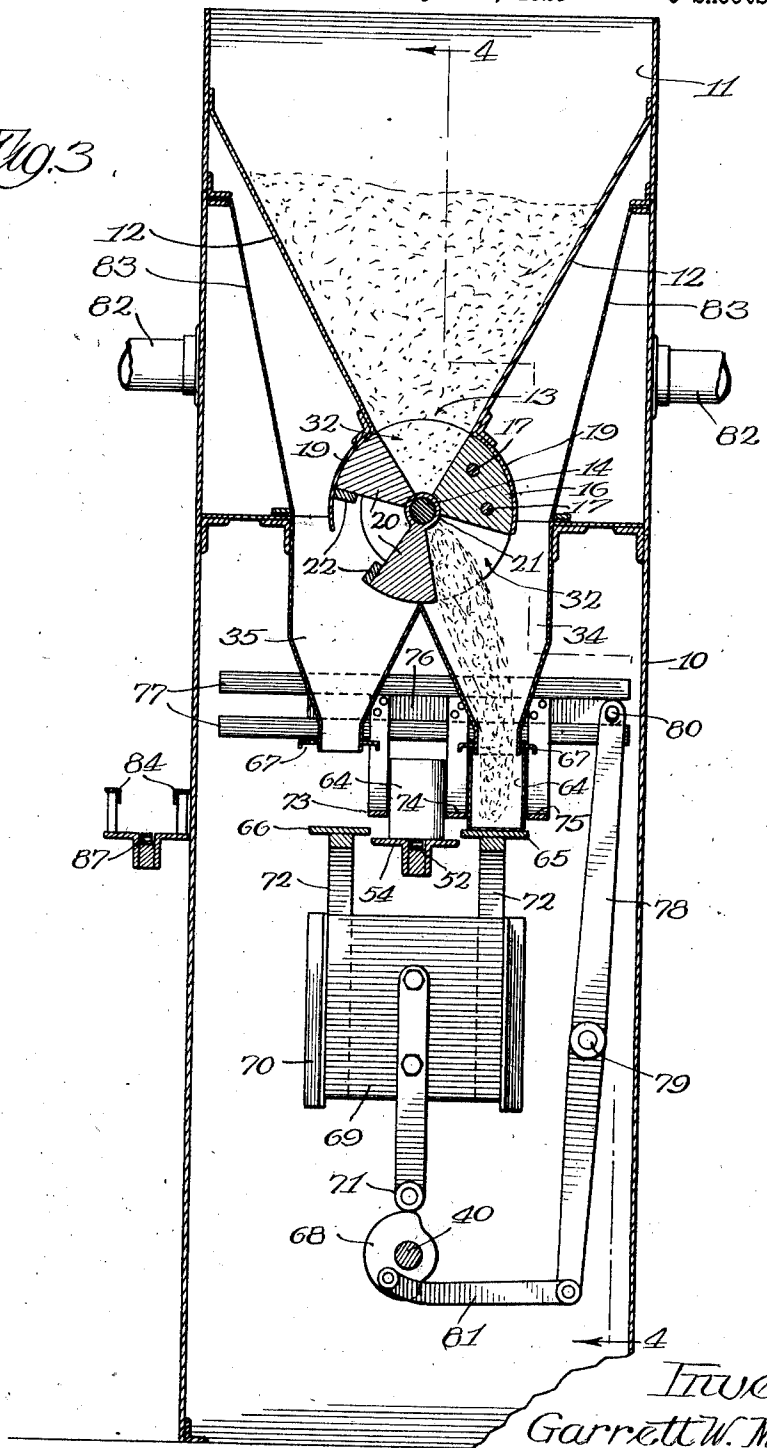
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May 14, 1929. G. W. MUDD 1,712,775

FILLING MACHINE

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Fig. 3.



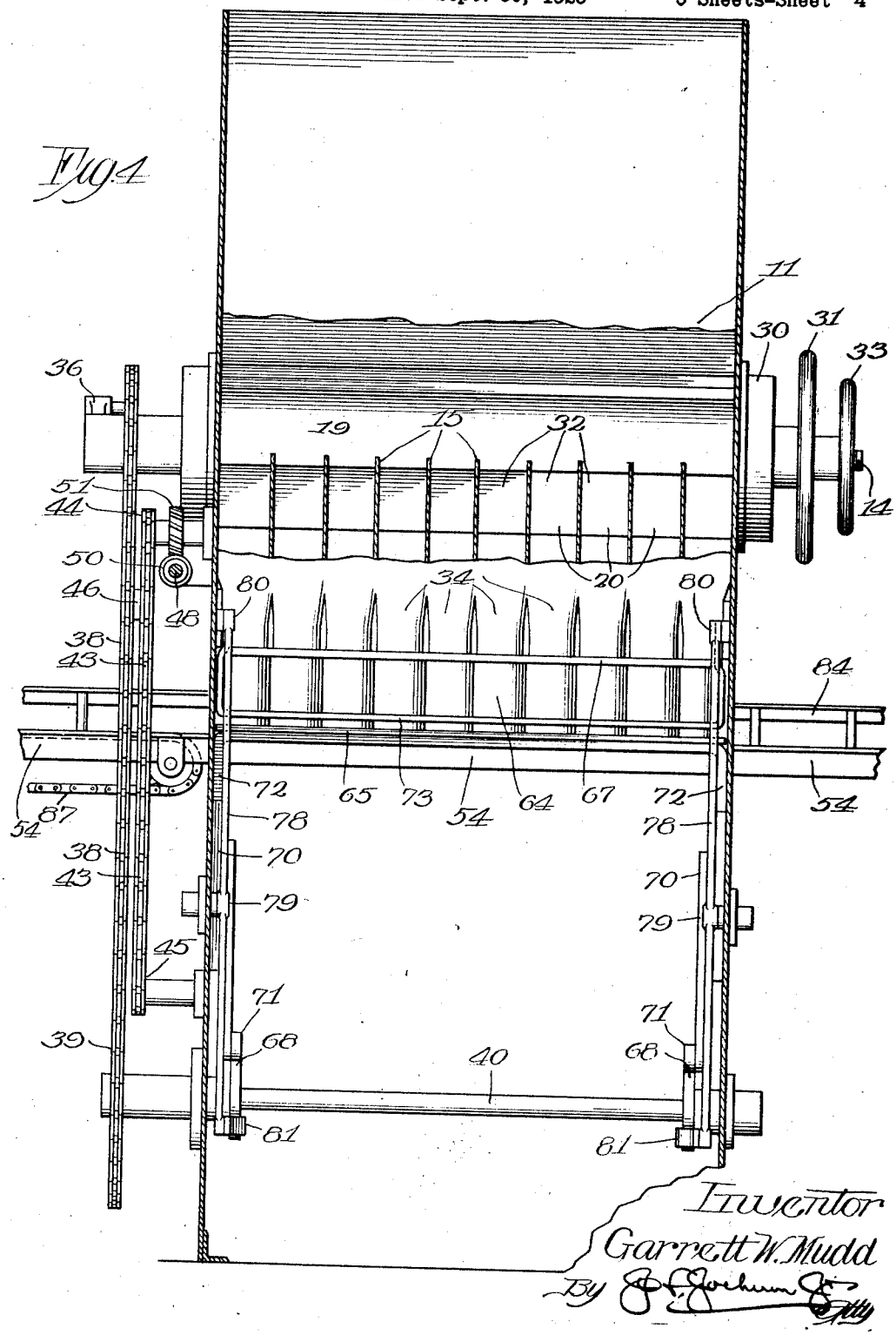
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May 14, 1929. G. W. MUDD 1,712,775

FILLING MACHINE

Filed Sept. 30, 1925 5 Sheets-Sheet 4

Fig. 4



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May 14, 1929. G. W. MUDD 1,712,775

FILLING MACHINE

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Fig. 5

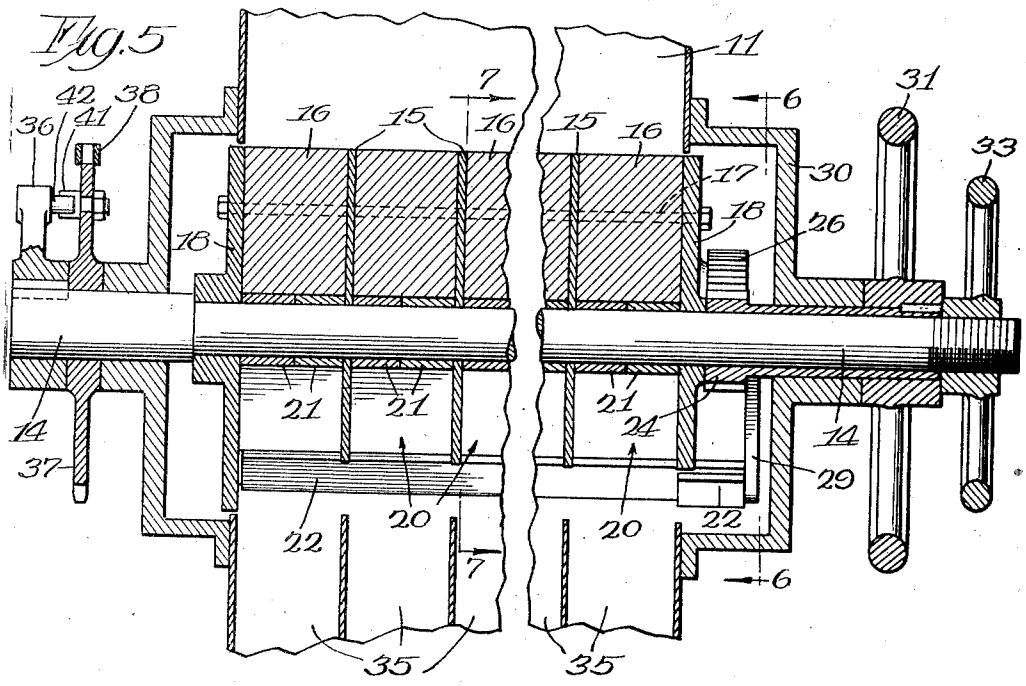


Fig. 6

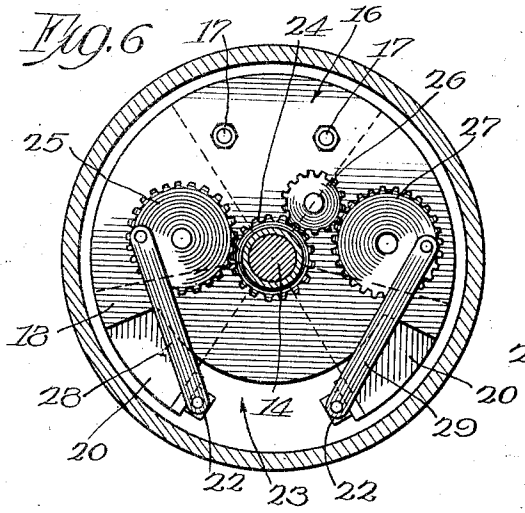


Fig. 7

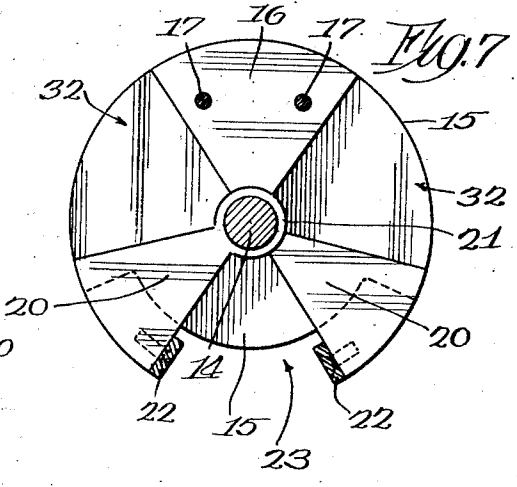
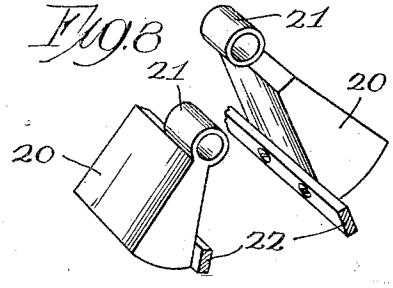


Fig. 8



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Patented May 14, 1929. 1,712,775

UNITED STATES PATENT OFFICE.

GARRETT W. MUDD, OF CHICAGO, ILLINOIS, ASSIGNOR TO MANUFACTURERS MACHINERY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FILLING MACHINE.

Application filed September 30, 1925. Serial No. 59,690.

This invention relates to improvements in filling machines, particularly adapted though not necessarily limited in its use for filling cans or similar receptacles with a powdered or granular material and one of the objects of the invention is to provide in a machine of this character improved means for simultaneously feeding a plurality of empty cans into the machine, simultaneously filling them and the removing and conveying away the filled cans.

A further object is to provide improved means whereby the quantity of material to be delivered to the cans may be varied to compensate varying sizes of cans.

A further object is to provide an improved machine of this character which will be of a comparatively simple and compact construction and effective, efficient and automatic in operation.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and as shown in the accompanying drawings illustrating the invention and in which drawings,

Figure 1, is an elevation of one end of the machine.

Figure 2, is a horizontal sectional view taken on line 2—2 Figure 1.

Figure 3, is a vertical sectional view taken on line 3—3 Figure 2.

Figure 4, is a vertical sectional view taken on line 4—4 Figure 3.

Figure 5, is an enlarged detail sectional view taken on line 5—5 Figure 1.

Figure 6, is a sectional view taken on line 6—6 Figure 5.

Figure 7, is a sectional view taken on line 7—7 Figure 5.

Figure 8, is a detail perspective view partly in section of some of the adjustable elements of the delivery drum and with the elements detached.

Referring more particularly to the drawings the numeral 10 designates a suitable structure for supporting a hopper 11 which has a bottom 12 that inclines downwardly from the walls to the center of the hopper and terminates in an outlet opening 13.

Journaled in suitable bearings and extending lengthwise of and at a suitable distance below the opening 13 is an oscillatory shaft 14 carrying a delivery drum for delivering the material from the hopper to the containers. The drum preferably consists of a series of disc like members 15 which are held laterally spaced from each other by means of blocks or members 16 preferably of a segmental construction and the disc and blocks are preferably secured to the drum and to each other by means of fastening bars or members 17 which pass therethrough and are connected with the ends or heads 18 of the drum so that the members 15 and blocks 16 will oscillate with the shaft 14.

The members 15 co-operate with each other and with the ends of the drum to form pockets which are on each side of the blocks or members 16 and are adapted to be alternately moved into and out of register with the opening 13 in the hopper as the shaft 14 is oscillated, and a casing 19 which partially surrounds the drum is provided to maintain the material against being accidentally discharged from the pockets.

Within each of the pockets are arranged two segment shaped members 20 each of which is preferably provided with a knuckle or eye 21 that are adapted to be alined and through which eyes or knuckles the shaft 14 passes so that the members 20 will be supported by the shaft for swinging movement with respect thereto.

One of the lateral faces of each of the members 20 co-operates with the adjacent lateral faces of the member 16 to form therewith pockets, the ends of these pockets being closed by the disc like members 15 and with respect to which latter the members 20 are adapted to swing about the shaft 14 to vary the size and capacity of the pockets and thereby regulate or guage the amount of material to be received and delivered by the pockets.

Any suitable means may be provided for adjusting the members 20 so that they will simultaneously move, such as bars or rods 22, one of these bars connecting each series of the members 20, the discs or members 15 being preferably cut away as at 23 (see Figure 7) to permit the bars 22 to extend across the members 20 and so as not to interfere with the rotative adjustment of the members 20.

Loosely mounted upon the shaft 14 is a gear 24 which meshes with a gear 25 preferably supported by one end of the drum.

The gear 24 also meshes with another gear 26 which in turn meshes with a gear 27. The gears 26 and 27 are also preferably carried by the end 18 of the drum. A link 28 is preferably connected by one end to one of the bars 22 and by its other end to the gear 25, and a similar link 29 is preferably connected by one end to the other bar 22 and by its other end to the gear 27.

The gears are preferably housed within a casing 30 and arranged on the outside of the casing and connected with the gear 24 is an operating handle or wheel 31 loosely supported by the shaft 14. By rotating the handle with respect to the shaft 14 the elements 20 will be caused to simultaneously move towards or away from the adjacent faces of the members 16 to increase or decrease the size of the material receiving pockets 32.

A clamping member 33 may be threaded upon the shaft 14 to lock or clamp the member 31 against rotation with respect to the shaft and thereby maintain the members 20 against adjustment and in fixed positions with respect to the member 16.

The shaft with all of the above described parts supported thereby is adapted for an oscillatory movement and such motion is imparted thereto in a manner to be later described.

Two series of delivery chutes 34—35 are arranged side by side beneath the drum and extend lengthwise of the machine. These chutes are so positioned that when the drum is rotated in one direction the contents of one series of pockets 32 will be delivered into the series 34 of the chutes and when the drum is rotated in the opposite direction the contents of the other series of pockets 32 will be delivered into the series 35 of the chutes. The two series of pockets 32 are so disposed with respect to each other that when one series is being emptied the other series is being filled by the material from the hopper 11.

The delivery drum is oscillated preferably by an arm 36 connected with one end of the shaft 14 to move therewith.

Loosely mounted upon the shaft 14 and in proximity to the arm 36 is a sprocket wheel 37 (see Figures 1 and 5) over which a sprocket chain 38 passes and which chain also passes over a sprocket wheel 39 carried by a shaft 40, and the sprocket chain 38 is somewhat loose to provide slack in the chain. Carried by the sprocket wheel 37 are spaced stops or projections 41 which are adjustable with respect to the sprocket and to each other through the medium of a slot 42 and the arm 36 operates between these stops or projections 41.

The sprocket 37 is oscillated by means of a chain or belt 43 which passes over sprocket wheels 44—45, and the chain 43 is secured to the chain 38 by means of a connection 46 (see Figure 4). As the chain 43 is given a constant direction of movement it will be seen that, as the length of travel is less than the length of travel of the chain 38, that is by reason of the chain 43 being shorter than the chain 38, an oscillatory movement will be given to the chain 38 and consequently to the sprocket 37.

Motion is imparted to the sprocket 44 and chain 43 preferably from a driving pulley 46 having a clutch connection 47 with a shaft 48 and the clutch may be controlled by a handle or lever 49 located in a convenient position for the operator.

Carried by the shaft 48 is a gear 50 preferably of the worm type which meshes with a gear 51 connected with the sprocket 44 for rotation therewith.

The cans or receptacles are fed into the machine preferably by means of an endless conveyor 52 one of the runs of which passes through the machine and is provided with flights or projections 53 arranged at suitable intervals and which engage behind one of the cans of a series to advance the cans.

The cans are moved along a suitable support 54 and the projections 53 on the conveyor 52 are so spaced that a predetermined number of cans will be advanced and positioned in the machine. The movement of the conveyor will then be arrested and there will be an interval of rest in the motion of the conveyor to permit of the proper filling operation.

The conveyor 52 passes over suitable sprockets 55, 56, and 57, and motion is imparted to the conveyor preferably from the shaft 48 through the medium of a gear on the shaft 48 which meshes with a gear 58 on a shaft 59 carrying a mutilated gear 60 (see Figure 2). The gear 60 meshes with a gear 61 that has connected with it to rotate therewith a gear 62 over which a chain 63 passes.

The chain 63 also passes over another gear (not shown) and which latter gear is connected with the gear 56 to rotate therewith and over which latter gear the conveyor 52 passes.

Motion being imparted to the mutilated gear 60 will cause an intermittent traveling movement to be imparted to the conveyor or carrier 52.

During the interval of rest of the conveyor 52 the cans or receptacles 64 which have been just advanced thereby, will be at rest between the outlet ends of the two series of chutes 34—35 and in position to be moved laterally from the conveyor to a position under one or the other of the series of discharge outlets 34—35, to be spaced considerably below the extremities of the respective chutes.

The entire series of cans just advanced by the conveyor will then be shifted laterally directly beneath one or the other of the series

of chutes and at the same time the series of cans that have just been filled by the other series of chutes, will be shifted laterally to a position to be engaged by the pins or projections 53 on the conveyor 52 and moved out of the machine.

This may be accomplished in any suitable manner but preferably as follows.

The support 54 and the co-operating run of the conveyor 52 are disposed intermediate the two series of chutes 34—35 so that the cans just advanced by the conveyor will when they are at rest be disposed intermediate the series of chutes.

Arranged on opposite sides of the conveyor 52 and beneath each of the series of chutes are platforms 65—66 which are normally flush with the top of the support 54 and are adapted to respectively receive the series of cans 64 when they are bodily and laterally shifted to one side or the other off of the support 54 and the platforms 65—66 are adapted to be raised and lowered during the interval of rest of the conveyor 52, to cause the ends of the respective chutes to enter into the respective cans and deliver the material into the cans and which material is supplied to the chutes from the pockets 32 in the drum as the latter is oscillated.

Stops 67 may be provided to be engaged by the ends of the cans when they are raised and these stops serve to form temporary closures for the cans while they are being filled.

The filled cans are also lowered during the interval of rest of the conveyor 52, to a position to be again moved on to the support 54 to be advanced and moved out of the machine by the conveyor 52.

This raising and lowering movement of the platforms 65—66 is preferably accomplished by means of a cam 68 (see Figure 3) on the shaft 40. A slide 69 movable in guides 70 has connected with it a roller 71 operating on the cam 68 and uprights 72 form connections between the slide 69 and the platforms 65—66.

Spaced parallel guideways are formed by laterally spaced members 73, 74, and 75, extending lengthwise of and adjacent the support 54 and these members are supported by a slide 76 movable in guideways 77 that extend transversely of the support 54 and conveyor 52. A lever 78 is pivotally supported intermediate its ends as at 79 and is connected by one end by means of a suitable connection embodying a pivot 80 with the slide 76. The other end of the lever is connected by means of a link 81 with the cam 68 so that the rotation of the cam will rock the lever 78 about its pivot 79 and cause the slide 76 to be moved forwardly and backwardly in its guide 77.

This movement will laterally shift the spaced members 73, 74, and 75, to move the series of cans off of the support 54 and alternately one series to one side and the next series to the other side of the support 54, the respective series of cans being moved first to one side off of the support 54 and then back again onto the support 54.

The members 73, 74, and 75, are so arranged and so operate that a guide way between adjacent members will always be in position to receive empty cans being advanced by the conveyor 52 and at the same time others of the members will hold one series of cans under one or the other of the series of chutes 34—35, and the members 73, 74, and 75, are so spaced that the cans will have a free vertical movement therebetween.

During the interval of time that the platforms 65—66 are being raised and lowered the conveyor 52 will be traveling to move the filled cans out of the machine and to supply a series of empty cans to be filled and when the platforms 65—66 are in their lowermost positions or flush with the top of the support 54, the conveyor 52 will be at rest to permit empty cans to be moved therefrom and filled cans to be placed upon the support 54 to be removed from the machine by the conveyor 52.

This placing and removing of the empty and the filled cans with respect to the conveyor 52 and support 54 is accomplished by the intermittent lateral shifting movement of the can guide members 73, 74, and 75.

Any dust that may be created within the machine from the handling of the material may, if desired, be removed by means of pipes 82 in which suitable suction may be maintained in any suitable manner (not shown).

A strainer or filter member 83 may, if desired, be provided over the end of the pipes 82.

A guide way 84 may be provided and along which the filled cans may be moved by the conveyor 52.

A conveyor 85 may also be provided for conveying the empty cans into a position that they may be placed upon the conveyor 52 (see Figures 1 and 2) and may be driven from the shaft 48, through the medium of a chain or belt 86. A conveyor 87 suitably driven may also be provided for conveying away the filled cans from the conveyor 52.

While the preferred form of the invention has been herein described and shown, it is to be understood that many changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:

1. A filling machine including a plurality of discharge chutes, means for simultaneously conveying a plurality of receptacles to the chutes, means common to all of said receptacles for simultaneously raising and

lowering them with respect to the said conveying means and the chutes, and means operating intermittently to simultaneously remove the receptacles from and also simultaneously return them directly to the first recited means.

2. A filling machine including a plurality of discharge chutes, means for simultaneously conveying a plurality of receptacles to the chutes, means common to all of said receptacles for simultaneously raising and lowering them with respect to the said conveying means and the chutes, and means operating intermittently to simultaneously remove the receptacles from and also simultaneously return them directly to the first recited means, the first recited means also operating to convey away the filled receptacles.

3. A filling machine including a plurality of discharge chutes, intermittently operating means for simultaneously conveying a plurality of receptacles into the machine, means common to the receptacles and operating to simultaneously remove them from the first recited means and to return them directly thereto, and means for simultaneously raising and lowering the receptacles with respect to the said chutes and while the receptacles are removed from the first said means.

4. A filling machine including a plurality of discharge chutes, intermittently operating means for simultaneously conveying a plurality of receptacles into the machine, means operating to simultaneously remove the receptacles from the first recited means and to also simultaneously return them directly thereto, means for intermittently actuating the second recited means, and means for simultaneously raising the series of receptacles with respect to the said chutes and while the receptacles are removed with respect to the first recited means.

5. A filling machine including a plurality of discharge chutes, means for simultaneously conveying a plurality of receptacles to the chutes, means for simultaneously raising and lowering the receptacles with respect to the chutes, means operating to intermittently deliver a supply of material to the chutes, and means operating intermittently to simultaneously remove the receptacles from and also simultaneously return them directly to the first recited means.

6. A filling machine including two series of discharge chutes, means for simultaneously conveying a plurality of receptacles to a position adjacent the chutes, means for simultaneously removing the receptacles from the conveying means, and means for raising and lowering the receptacles with respect to the chutes, the first recited means also operating to feed an additional series of receptacles to a position adjacent the chutes during the raising and lowering movements of the first recited series of receptacles, the second recited means also operating to remove the said additional series of receptacles from the first recited means and return the filled receptacles thereto, the third recited means operating to return the filled receptacles simultaneously with the removal of the additional and empty series of receptacles.

7. A filling machine including two series of discharge chutes, means for simultaneously conveying a plurality of receptacles to a position adjacent the chutes, means for simultaneously removing the receptacles from the conveying means, means for raising and lowering the receptacles with respect to the chutes, the first recited means also operating to feed an additional series of receptacles to a position adjacent the chutes during the raising and lowering movements of the first recited series of receptacles, the second recited means also operating to remove the said additional series of receptacles from the first recited means and return the filled receptacles thereto, the third recited means operating to return the filled receptacles simultaneously with the removal of the additional and empty series of receptacles, and means operating to alternately deliver supplies of the material to the respective series of chutes.

8. A filling machine including two series of discharge chutes, means for simultaneously conveying a plurality of receptacles to a position adjacent the chutes, means for removing the receptacles from the conveying means, means for raising and lowering the receptacles with respect to the chutes, the first recited means also operating to feed an additional series of receptacles to a position adjacent the chutes during the raising and lowering movements of the first recited series of receptacles, the second recited means also operating to remove the said additional series of receptacles from the first recited means and return the filled receptacles thereto, the third recited means operating to return the filled receptacles simultaneously with the removal of the additional and empty series of receptacles, and means operating to alternately deliver supplies of material to the respective series of chutes, the last recited means including means whereby the quantities of material delivered to the chutes may be varied at will.

9. A filling machine including two series of discharge chutes arranged adjacent each other, conveying means intermediate the two series for feeding an empty series of receptacles between the said series of chutes, means for simultaneously removing the empty receptacles from the conveying means and for placing them under one of the series of chutes, and means for raising and lowering the receptacles with respect to the chutes and while they are removed from the conveying means, the said conveying means also operating to position another series of empty receptacles intermediate the chutes while the first recited

series of receptacles are being filled, the second recited means operating to return the filled receptacles to the conveying means and to interchange the filled receptacles with the said series of empty receptacles upon the said conveying means.

10. A filling machine including a plurality of discharge chutes, a conveyor for simultaneously conveying a plurality of receptacles to a position adjacent the chutes, means for raising and lowering the receptacles with respect to the chutes, means operating to simultaneously and laterally remove the receptacles from and also simultaneously return them to the conveyor, the last recited means including spaced guides between which the receptacles are positioned, and means for intermittently actuating the guides, the said guides permitting a raising and lowering movement of the receptacles with respect thereto.

11. A filling machine including a plurality of discharge chutes, a conveyor for simultaneously conveying a plurality of receptacles to a position adjacent the chutes, means for raising and lowering the receptacles with respect to the chutes, means operating to simultaneously and laterally move the receptacles from and also simultaneously return them to the conveyor, the last recited means including spaced guides between which the receptacles are positioned, means for intermittently actuating the guides, the said guides permitting a raising and lowering movement of the receptacles with respect thereto, and means carried by the chutes and serving as temporary closures for the receptacles during the filling operation.

12. A filling machine including a plurality of discharge chutes, a conveyor for simultaneously conveying a plurality of receptacles to the chutes, means common to the receptacles for simultaneously raising and lowering them with respect to the chutes, means carried by the chutes and serving as temporary closures for the receptacles, and means operating to simultaneously remove the receptacles from and also simultaneously return them directly to the conveyor.

13. A filling machine including two delivery chutes, an oscillatable element intermediate the chutes and provided with pockets individual to the chutes, means adapted to be adjusted about the pivot of said element and maintained in fixed adjusted position for varying the size of the pockets, and means for oscillating the element to cause the pockets to alternately discharge into the chutes.

14. A filling machine including two delivery chutes, an element intermediate the chutes and provided with pockets individual to the chutes, means for varying the size of the pockets, means for oscillating the said element to cause the pockets to alternately discharge into the chutes, the said pockets embodying end members, a fixed member therebetween, and pivotally mounted elements intermediate the end members, the respective proximate faces of the said elements and the said fixed member co-operating to form the sides of the respective pockets, and means for adjusting the said elements with respect to each other and the said fixed member to vary at will the size of the pockets.

15. A filling machine including a delivery element, said element embodying pockets comprising spaced members and a fixed partition occupying a portion of the space between the members, pivotally mounted elements disposed in the space between the said spaced members and movable towards and away from each other, the respective adjacent faces of the last said elements and the said partition co-operating to form the side walls of the pockets, and means for simultaneously adjusting the said pivotally mounted elements to vary the size of the respective pockets.

16. A filling machine including a delivery element, said element embodying pockets comprising spaced members and a fixed partition occupying a portion of the space between the members, pivotally mounted elements disposed in the space between the said spaced members and movable towards and away from each other, the respective adjacent faces of the said pivotally mounted elements and the said partition co-operating to form the side walls of the pockets, gears rotatably supported adjacent the end of the said delivery element, links, one end of each of the links being connected with one of the said pivotally mounted elements and by the other end to one of the said gears, an operating handle, and a gear connection between the handle and the first recited gears for causing the said elements to be moved towards or away from the said partition.

17. A filling machine including a delivery element, said element embodying pockets comprising spaced members and a fixed partition occupying a portion of the space between the members, pivotally mounted elements disposed in the space between the said spaced members and movable towards and away from each other, the respective adjacent faces of the said pivotally mounted elements and the said partition co-operating to form the side walls of the pockets, gears rotatably supported adjacent the end of the said delivery element, links, one end of each of the links being connected with one of the said pivotally mounted elements and by the other end to one of the said gears, an operating handle, a gear connection between the handle and the first recited gears for causing the said pivotally mounted elements to be moved towards or way from the said partition, and means for locking the said handle and gears against operation.

18. A filling machine including an oscilla-

tory delivery element, and means for imparting an oscillatory movement thereto, the said means including an endless driving element having a constant direction of movement, a second endless driving element connected with the said delivery element, and a connection between one of the runs of the two endless driving elements, the second recited endless driving element being of a greater length than the first recited endless element whereby a forward and backward movement will be imparted to the second recited endless element while the direction of movement of the first recited driving element remains constant.

19. A filling machine including an oscillatory delivery member, a projection carried by one end of the member, an oscillatary member, adjustable elements carried by the last said member and between which elements the said projection is disposed to be alternately engaged by the said elements, and means for oscillating the said oscillatory member.

20. A filling machine including an oscillatory delivery member, a projection carried by one end of the member, an oscillatory member, adjustable elements carried by the last said member and between which elements the said projection is disposed to be alternately engaged by the said elements, and means for oscillating the said oscillatory member, the last said means including an endless flexible element engaging over the said oscillatory member.

In testimony whereof I have signed my name to this specification, on this 16th day of September, A. D. 1925.

GARRETT W. MUDD.