Sept. 19, 1933. J. A. McENTEE ET AL 1,927,318

MACHINE FOR PACKAGING ARTICLES

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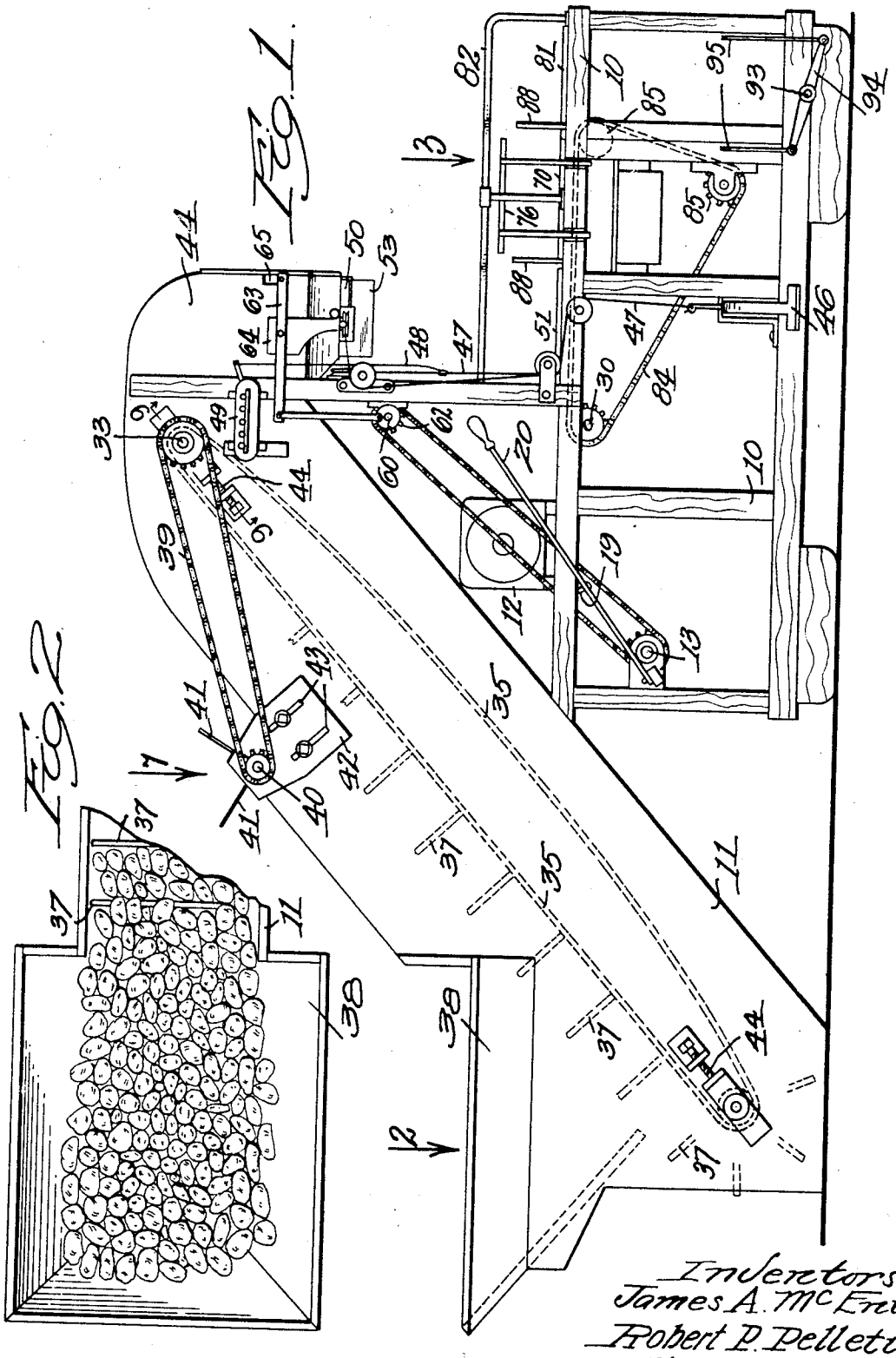


Fig. 1

Fig. 2

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MACHINE FOR PACKAGING ARTICLES

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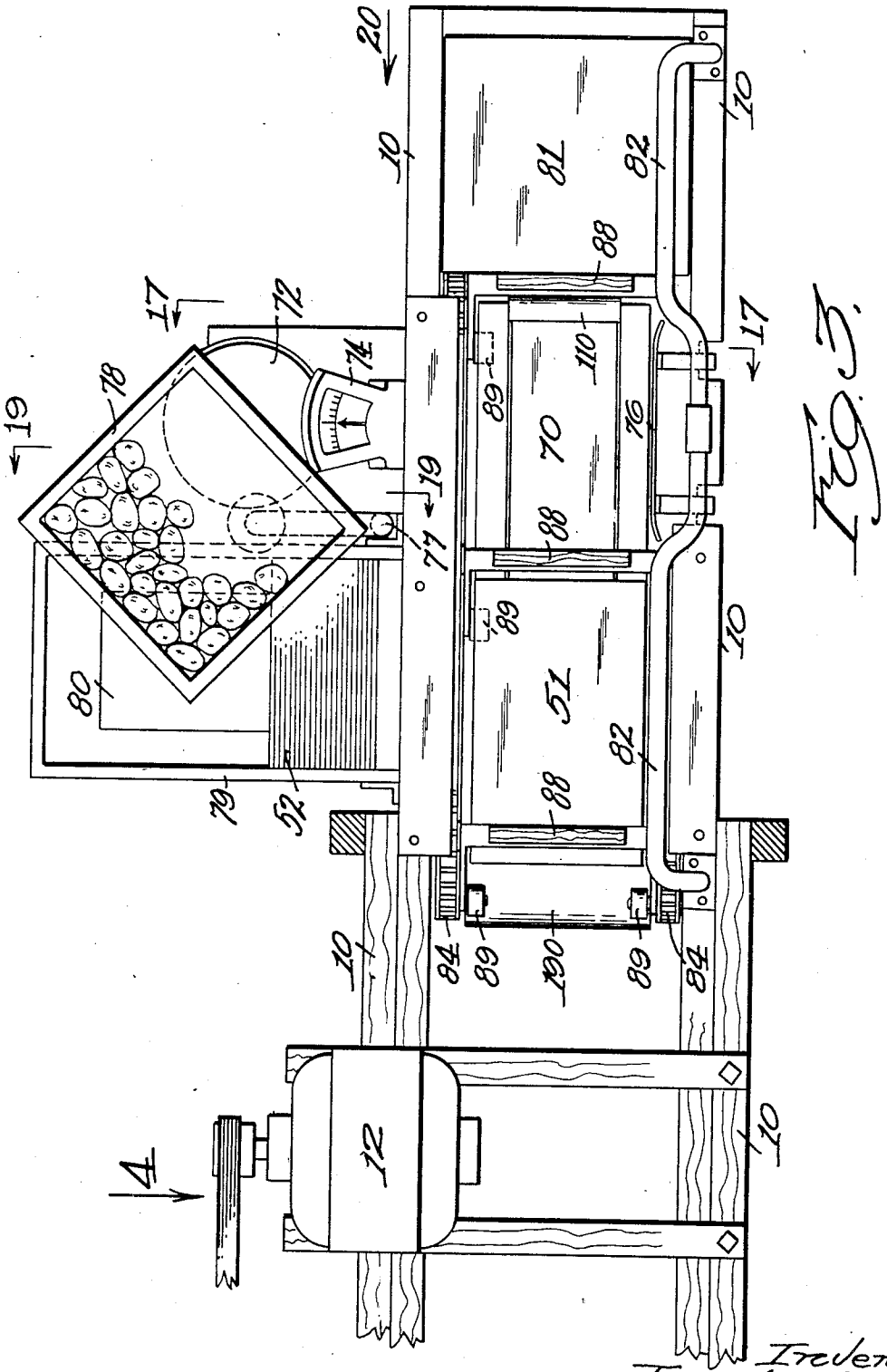


Fig. 3.

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MACHINE FOR PACKAGING ARTICLES

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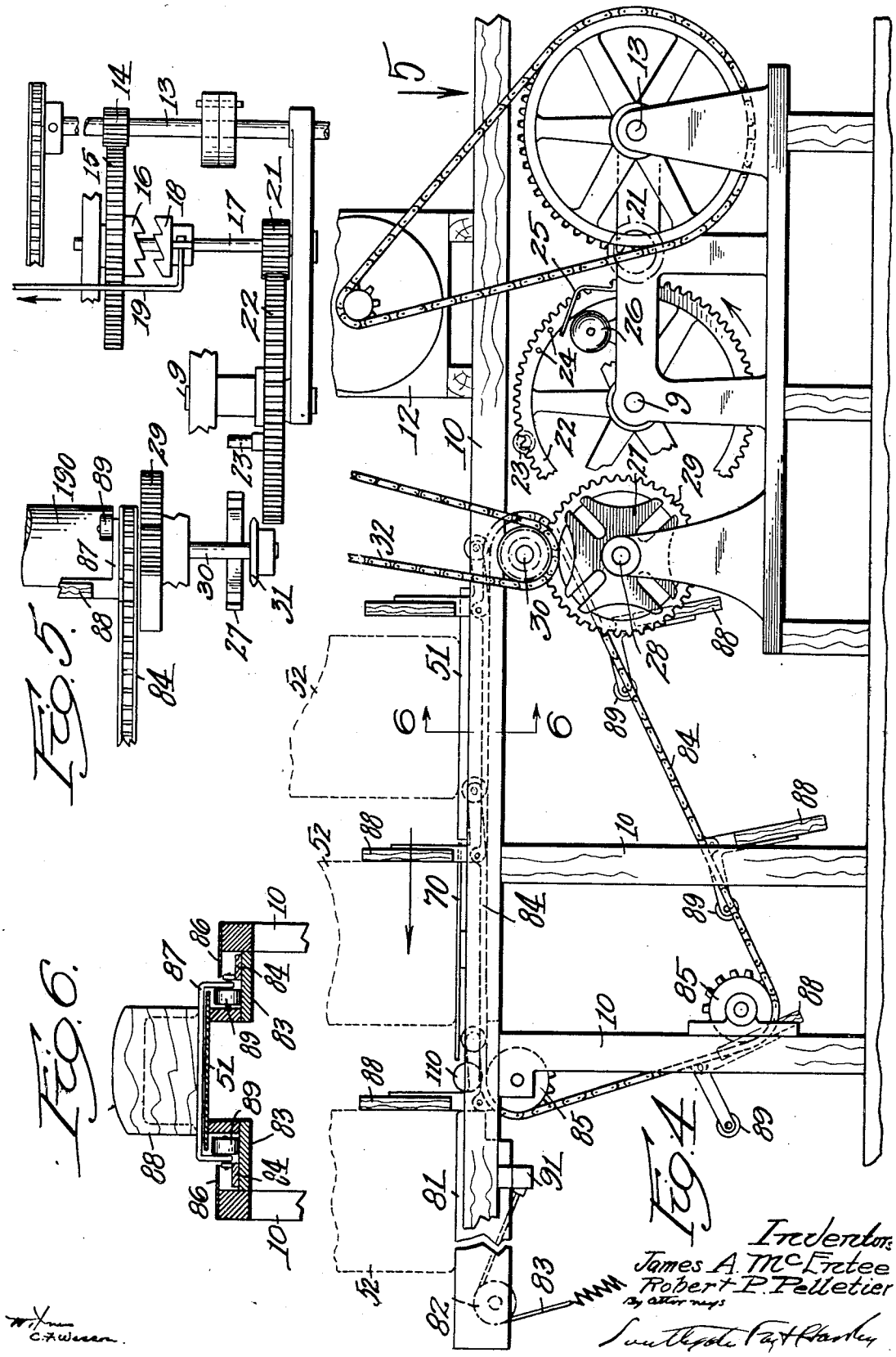


Fig. 5.

Fig. 6.

Fig. 4.

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MACHINE FOR PACKAGING ARTICLES

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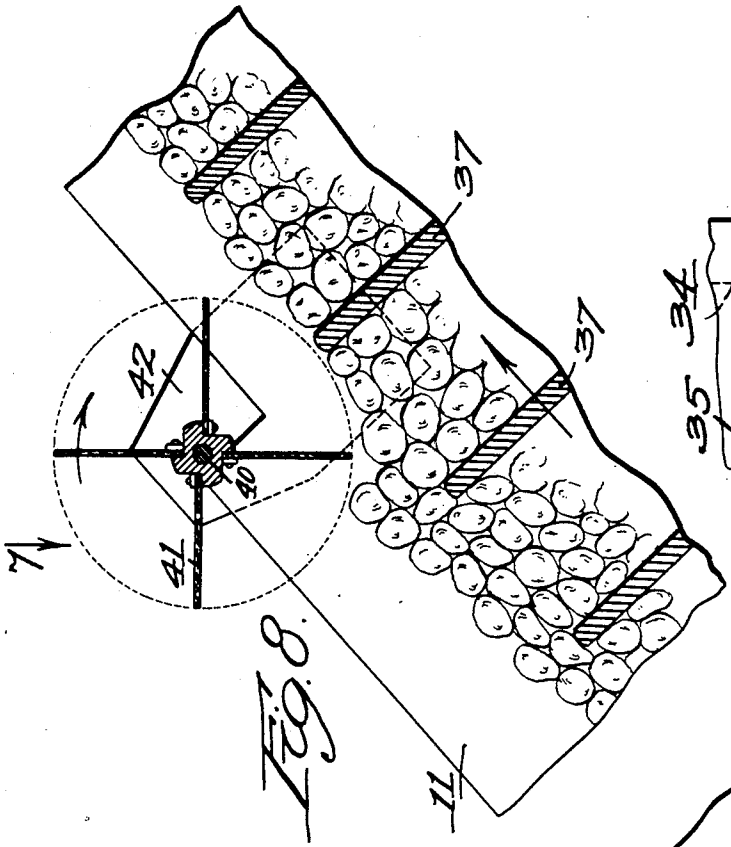


Fig. 8.

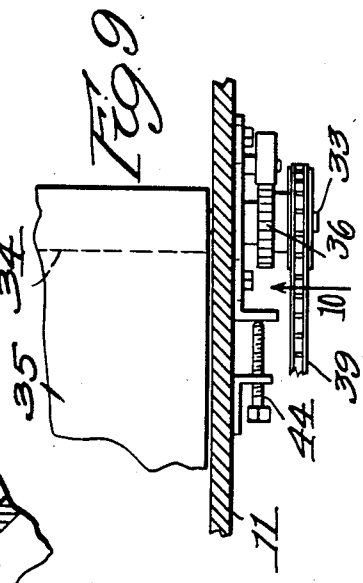


Fig. 9

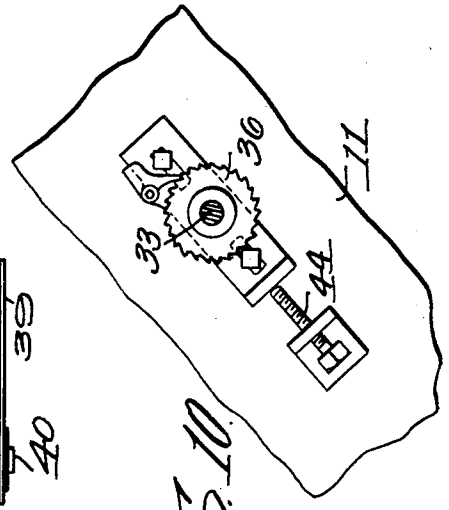


Fig. 10.

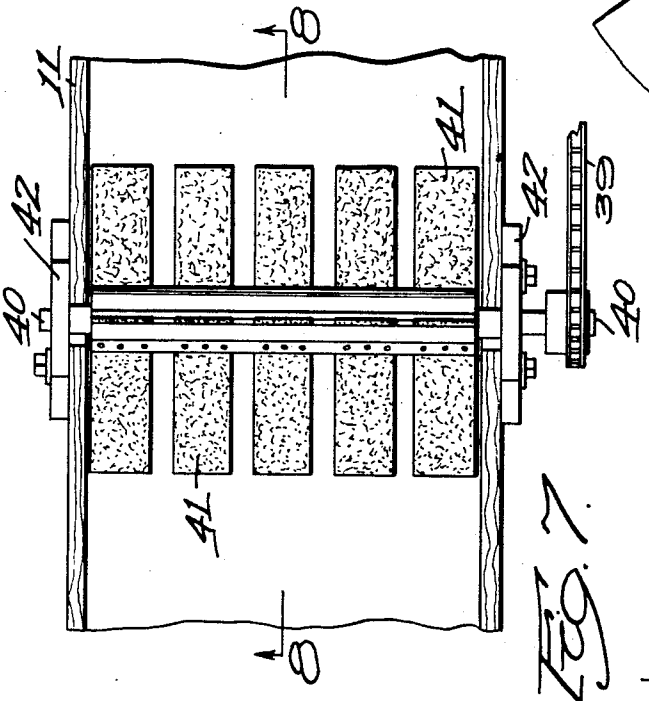


Fig. 7.

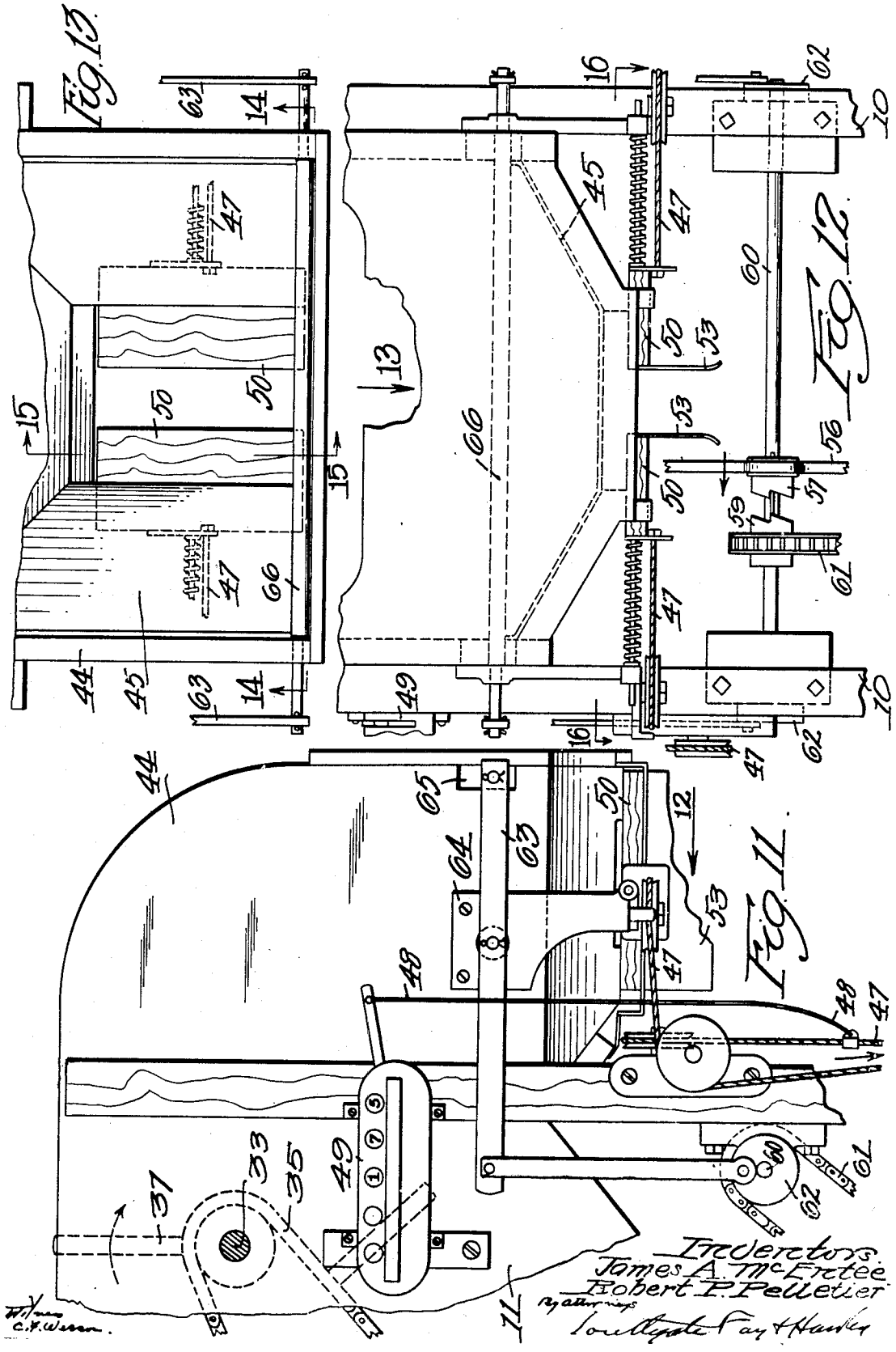
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MACHINE FOR PACKAGING ARTICLES

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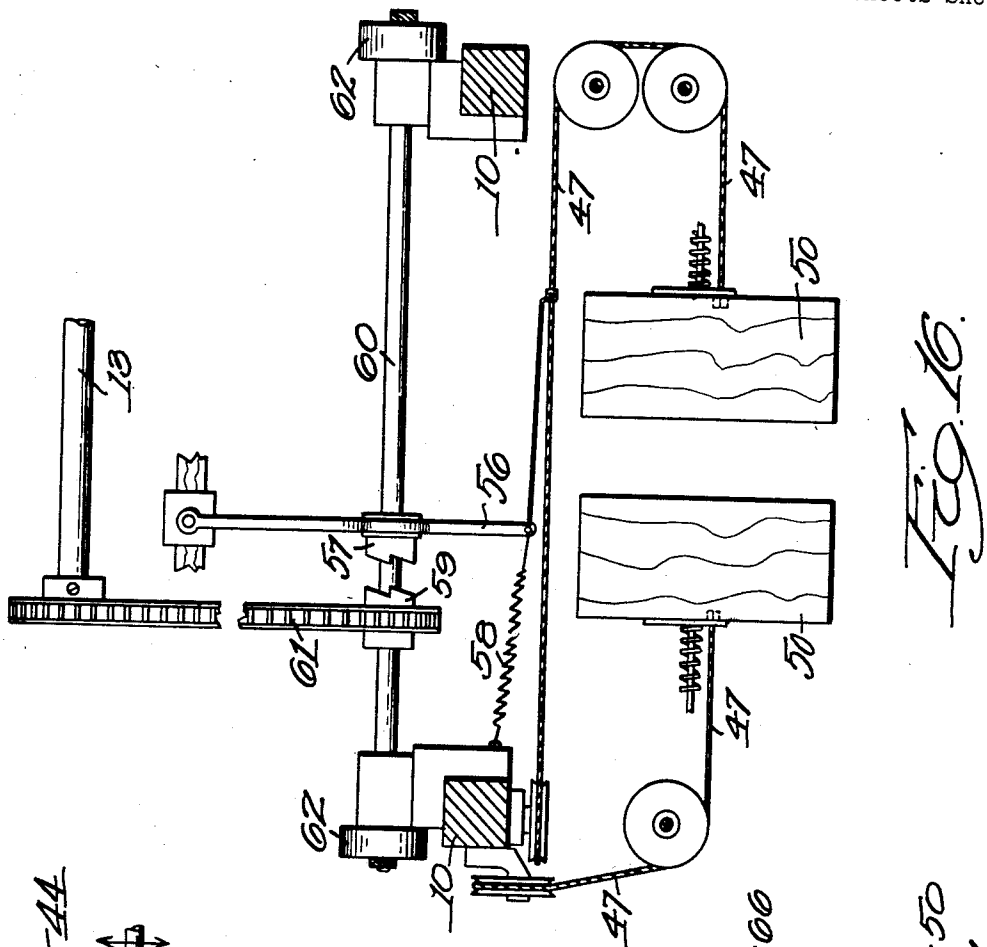


Fig. 16.

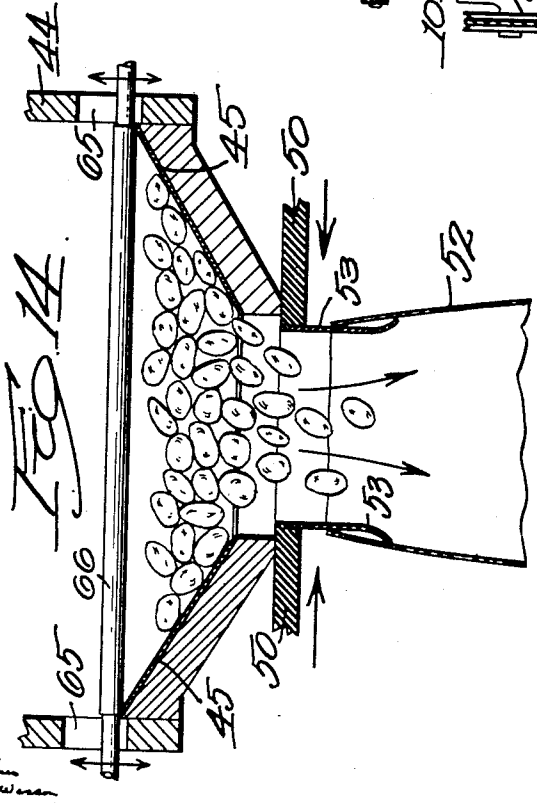


Fig. 14.

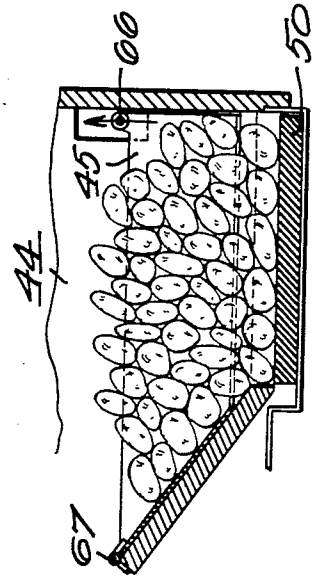


Fig. 15.

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MACHINE FOR PACKAGING ARTICLES

Filed Nov. 5, 1930 8 Sheets-Sheet 7

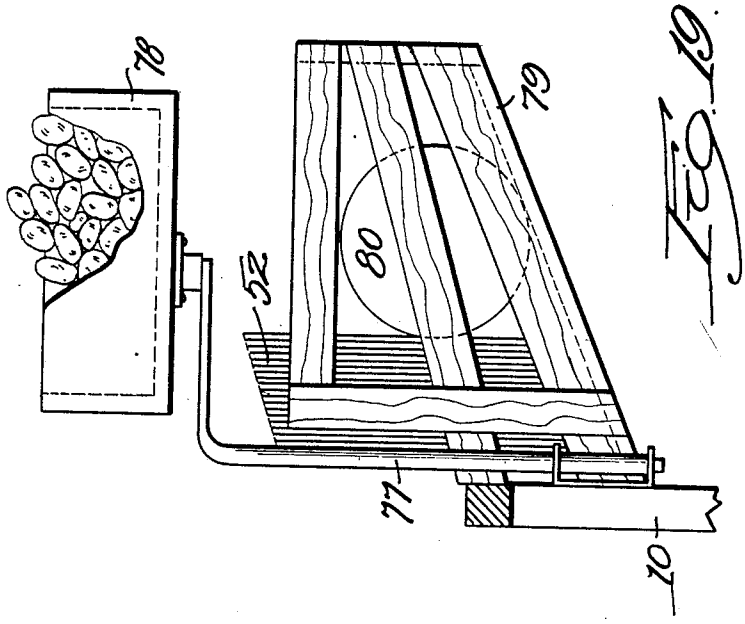


Fig. 19.

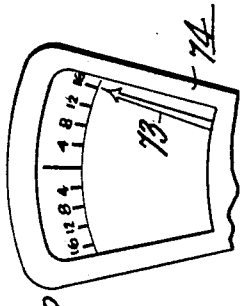


Fig. 18.

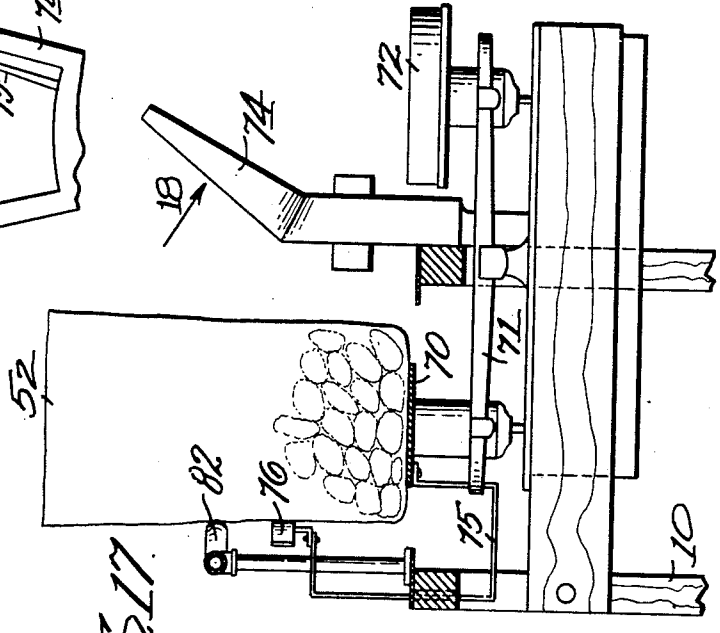


Fig. 17.

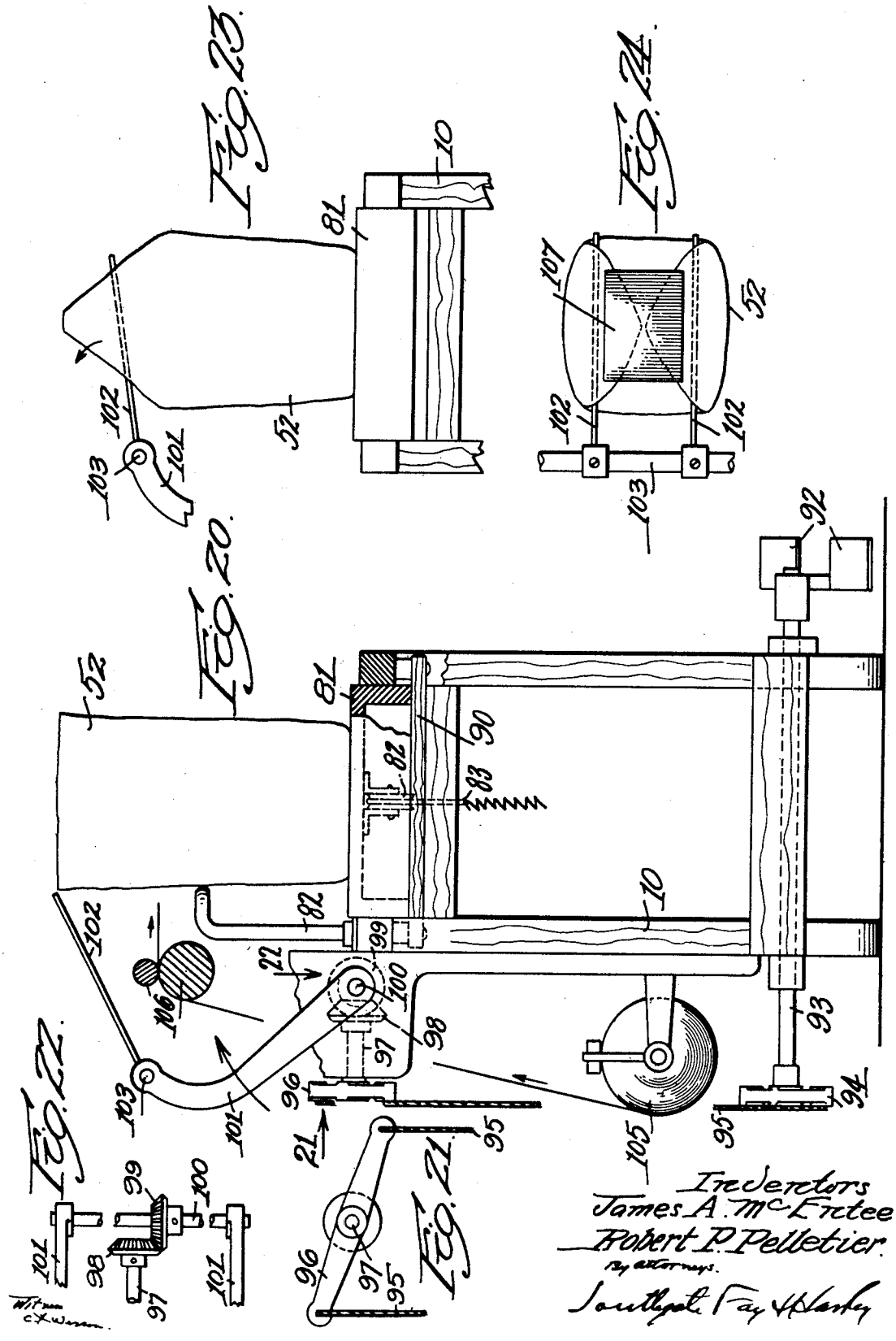
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MACHINE FOR PACKAGING ARTICLES

Filed Nov. 5, 1930 8 Sheets-Sheet 8



Patented Sept. 19, 1933 1,927,318

UNITED STATES PATENT OFFICE

1,927,318

MACHINE FOR PACKAGING ARTICLES

James A. McEntee and Robert Pelletier, Worcester, Mass., assignors to Chester E. Williams, Worcester, Mass.

Application November 5, 1930. Serial No. 493,580

8 Claims. (Cl. 226—61)

This invention relates to a machine for measuring out into compartments the desired quantity of articles such as potatoes or other vegetables or lumps of coal or other materials, introducing the entire contents of one compartment into a bag, weighing, counting and folding the bag and sealing it.

The principal objects of the invention are to provide improved means for insuring that each compartment of a conveyer in which the articles are introduced into the machine shall contain substantially the same quantity; to provide means for moving a measured quantity of the material in a bag into a runway; to provide means for moving the open bag along the runway and weighing it; to provide for moving the bag with its contents into another position; to provide rods for engaging the bag and holding it in proper position while the top is folded; to provide means whereby the depression of a treadle or lever will operate a counter, swing open the bottom of a hopper for receiving the articles from the elevator for the purpose of fully opening a bag underneath for receiving them and also vibrate a portion of the hopper to insure that all the articles pass down out of it; to provide improved means for opening the bag; to provide a conveyer having flights normally perpendicular to the conveyer for pushing the bags filled with the articles along their course; to provide improved flights or pushers so arranged that when the upper strand of the bag reaches the end of its travel the flight located at that point at that instant will move vertically and quickly out of the way; to provide means for then sealing the bag and delivering it and to provide these means in such cooperative relationship that the features of the invention will all work in the proper sequence and each bag will be treated alike.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a front elevation of a machine constructed in accordance with this invention;

Fig. 2 is a plan of the hopper into which the articles are introduced and the lower part of the elevator;

Fig. 3 is a plan of the part of the machine beyond the elevator;

Fig. 4 is a rear side view looking in the direction of the arrow 4 in Fig. 3;

Fig. 5 is a plan of a part of the driving mechanism as indicated by the arrow 5 in Fig. 4;

Fig. 6 is a sectional view on the line 6—6 of Fig. 4;

Fig. 7 is a plan of the means for leveling the contents of the elevator so that too many of the articles will not be retained in any compartment thereof;

Fig. 8 is a longitudinal sectional view of the same on the line 8—8 of Fig. 7;

Fig. 9 is a sectional view on the line 9—9 of Fig. 7 showing a part of the driving means for the elevator;

Fig. 10 is an end view of the same taken in the direction of the arrow 10 in Fig. 9;

Fig. 11 is a side view, more in detail than Fig. 7, showing the counting and bag opening mechanism;

Fig. 12 is an end view of the hopper in which the elevator discharges, looking in the direction indicated by the arrow 12 in Fig. 11;

Fig. 13 is a plan of the same as indicated by the arrow 13 in Fig. 12;

Fig. 14 is a sectional view on the longitudinal line 14—14 of Fig. 13;

Fig. 15 is a sectional view on the transverse line 15—15 of Fig. 13;

Fig. 16 is a sectional view on the line 16—16 of Fig. 12, showing the bag opening mechanism;

Fig. 17 is a sectional view of the weighing mechanism taken on the line 17—17 of Fig. 3;

Fig. 18 is a side view taken at an angle, as indicated by the arrow 18 in Fig. 17, of the weighing scale;

Fig. 19 is a sectional view of the bag holder on the line 19—19 of Fig. 3;

Fig. 20 is an end view of the sealing mechanism as indicated by the arrow 20 in Fig. 3;

Fig. 21 is a side view as indicated by the arrow 21 in Fig. 20;

Fig. 22 is a plan of certain mechanism as indicated by the arrow 22 in Fig. 20;

Fig. 23 is an end view showing the operation of the rods used in closing the bag, and

Fig. 24 is a plan of the bag completely closed.

The machine is shown as mounted on a frame 10 and provided with a conveyer frame 11 at one end. On the frame is mounted a motor 12 which by a sprocket chain or belt drives a shaft 13. On this shaft is a pinion 14 driving a gear 15 on the loose half of a clutch 16 on a shaft 17. The other half of this clutch 18 is slidably splined to the shaft and operated by a rod 19. This rod 19 is operated from the front of the machine by a lever 20. One man stands at the front where among other things he can operate this rod to connect the shaft 17 with the motor. This shaft through

a pinion 21 and gear 22 drives a shaft 9. This gear 22 carries a pin 23 projecting from it in a transverse direction. It also carries two small pins 24 which, once during each rotation of the gear, operate a spring clapper 25 and sound a bell 26 for the purpose to be described.

The pin 23 operates a Geneva wheel 27 on a shaft 28. Of course, a single rotation of the gear 22 operates this shaft 28 a quarter of a revolution in the form shown. On the shaft 28 is a gear 29 meshing with a pinion on a shaft 30 to turn it. On this shaft is a sprocket wheel 31, which, through a chain 32, operates the shaft 33 of a conveyer for feeding the material into the machine. On this shaft 33 is a roll 34 for supporting the conveyer apron 35. This conveyer is provided with rigid division plates 37 which, on the operating strand of the conveyer, are parallel with each other and perpendicular to the conveyer. They are all equally distanced apart from each other so that when the potatoes or other articles are placed in the hopper 38, feeding freely down to the conveyer, the compartments between the division plates will contain approximately the same volume of potatoes.

Also on the shaft 33 there is a sprocket which operates a chain 39 for running a shaft 40. This shaft is provided with radial blades 41 which project over the tops of the plates 37 and act as shown in Fig. 8 to level the articles in the compartments by pushing them back, if there is a surplus, into the compartments below. The shaft 40 is mounted on two opposite bearing plates 42 which are provided with adjusting screws in slots 43 so that the height of the leveling plates can be regulated. The shaft 33 and the shaft at the bottom of the conveyer are mounted in bearings which are adjustable by screws 44 to provide for getting the operative strand of the conveyer into any desired degree of tautness.

In Figs. 9 and 10 is shown a ratchet wheel 36 on the end of the shaft 33 and a pawl engaging the ratchet wheel and preventing this shaft from turning backwards as it otherwise would on account of the weight of the load carried by the active strand of the conveyer.

In this way the potatoes or other articles are brought up to the top of the conveyer 35 and a compartment full at a time dumped from the upper end thereof directly into a second hopper 44. This conveyer is operated by the Geneva wheel to dump one compartment full and then stop. This hopper 44 is provided with inclined surfaces at the bottom having a wide opening between them. A separate thin plate or lining 45 covers this bottom. This separate plate is intended to be vibrated for the purpose of insuring that all the articles are discharged from the hopper. They never remain in the hopper and it is merely a converging guide to direct the potatoes into a bag. The plate 45 is a hopper itself and might constitute the entire hopper.

On the front side of the machine where an attendant stands is a foot treadle 46. This is connected by flexible connections 47 and 48 with a counter 49. Thus every time this treadle is depressed the counter will be actuated. This flexible connection 47 is divided into two parts and each one passes over idler pulleys and their ends extend inwardly toward each other in a plane as shown in Fig. 12. They are connected with two spring pressed slides 50 mounted to move horizontally in guides just below the open bottom of the hopper. These slides are never necessarily closed any further than shown in Fig. 15 which is intended as illustrating their limiting position. They are held in this position by the cords 47. They are pulled back by the connections 47 when the attendant steps on the treadle 46. The purpose of these plates or slides 50 is not to close the bottom of the hopper but to open a bag 52 which is placed by an attendant on a fixed platform 51 in position to be filled. In that case each slide 50 is provided with a depending plate 53. The attendant places the bag in such a position that when these slides 50 are in the position shown in Fig. 12 they will extend down into the bag. When the slides are drawn apart as shown in Fig. 14 they will open the bag so that the potatoes will fall into it. In this way it is insured that the potatoes will fall down into the bag.

One of the strands of the flexible connection 47 is also connected with a lever 56 which is connected with a movable section 57 of a clutch. A spring 58 normally pulls this lever over into position to close this clutch section against the other clutch section 59 which is rotatable on a shaft 60. Thus the stepping on the treadle 46 registers the count, opens the bag and allows the spring 58 to close the clutch 57—59. The clutch section 59 is operated by a sprocket chain 61 from the shaft 13.

The shaft 60 is provided with an eccentric 62 on each end which by links operates levers 63. These levers are pivoted on stationary brackets 64 and their outer ends move up and down in slots 65 in the sides of the hopper 44. These levers are connected by a rod 66 with the lining 45 of the hopper. Therefore the depression of the treadle vibrates this lining about its hinge 67 at one end, thus acting to clear the material out of the hopper and insure that it all goes into the bag.

The bag 52 in which the articles are now deposited rests on a platform 51. A conveyer 84 pushes it along on a plate 70 which constitutes the pan of a scale. This plate is fixed on a scale arm 71 and on the opposite arm is a weight 72 which, once having been gauged to the correct weight, does not have to be changed ordinarily. An operator has to watch a scale arm 73 and see that each bag weighs the exact amount, sixteen pounds being indicated here. The scale is located in a casing 74 in a convenient position for the operator to observe it.

It will be noticed that on the plate 70 is fixed an arm 75 provided with a light plate 76 intended to be engaged by the bag 52 and if the bag is not placed in the right position it is pushed by the attendant into contact with this plate 76.

Pivoted on a vertical stud 77 is a tray 78 for receiving the potatoes or the article being bagged so that the attendant who watches the weight can add enough to the number in the bag to make the weight correct if it is not so and also can take some out if it is overweight and put them back into this tray.

It might be remarked at this stage that a container 79 for the paper bags is located at a convenient point for an operator. A ball or cylinder 80 is located behind the bags. The bottom of the container is inclined so that this ball holds the bags down against the front wall of the container and they are removed from that position by the operator who operates the pedal 46.

The next step is for the conveyer 84 to push the bags forward in the machine from the platform or plate 70 to another platform 81. The platforms 51, 70 and 81 are in the same plane

and close to each other. They form a straight course through which the articles pass through the rest of the machine. There is a bar 82 extending along the platforms 51 and 81, the inner surface of which is in the same vertical plane as the plate 76. They constitute guides for the bags.

Near each end of the shaft 30 are a pair of sprockets carrying endless chains 84. These chains are also carried by other sprockets 85 suitably placed to provide a top vertical strand. The top strands of the chains move along stationary tracks 83 mounted on the frame 10. Above the strands are guide plates 86 to prevent the chains being displaced. The platform 51 is carried by these tracks 83, as shown in Fig. 6. The chains are connected across at intervals suitable for receiving a bag between them by U-shaped metal pieces 87, each one provided with a pusher plate 88. These pieces 87 are pivoted to the chains and have rearwardly projecting arms carrying freely rotatable guide rollers 89. These rollers move over the tracks 83 from a roll 190 on the shaft 30 to the end of the track. Consequently the pusher plates 88 are held rigidly in an upright position so that the bags are pushed from the platform 51 to the platform 70 and from that to the platform 81. This action takes place every time the shaft rotates a quarter of a revolution and each bag is advanced an equal distance each time. The pushers are brought around to vertical position and caused to descend vertically at the end of the track.

The platform 81 is in the form of a slide mounted on a rail 90 fixed on the frame and in a stationary place on the frame is a fixed bracket 91. The sliding platform 81 has a grooved wheel 82 thereon. A flexible connection 83 is connected by a spring at a stationary point on the frame or elsewhere. It passes over the wheel and is secured to the bracket 91. Consequently as the pusher plates move along in the direction of the arrow in Fig. 4 to discharge the bags they will come eventually into the position shown in Fig. 4 against the platform 81 which yields until the plate passes by a free roller 110. Then the plates 88 move straight down out of the way of the bag between the roller 110 and the platform 81. After that these plates 88 can tip over in any desired way but when they come back to the starting position they will be restored to a vertical position by the roll 190.

At this end of the machine there is a double treadle 92 on a shaft 93 which on the end has a double arm lever 94, each one connected by a flexible connection 95 with a double arm lever 96 fixed to a shaft 97. It will be seen, therefore, that pushing down either treadle by any attendant will turn this shaft. This shaft 97 has a bevel gear 98 meshing with a bevel gear 99 on a cross shaft 100 which has two arms 101 thereon. On the ends of these arms are fixed a pair of rods 102 by means of a cross shaft 103.

Now when the bag is in the position shown in Fig. 20, all filled and weighed, the attendant steps on the treadle and brings the arms to the position shown in Fig. 23, and then to a horizontal position between the extreme sides of the bag. These arms hold the inner sides of the bags down and the same attendant folds down two other sides as shown in Fig. 24.

After this operation is performed, a strip of gummed paper on a roll 105 is drawn up through a pair of rolls 106 and moistened and cut off and pasted down on the top of the bag to form a seal 107. I have not shown herein the means for moving this paper, moistening it, or cutting it off. It is done by any ordinary kind of machinery for that purpose. This completes the sealing of the bag. It is removed from the platform 81 by hand and disposed of as desired.

It will be seen, therefore, that one attendant pushes down the treadle 46 and thereby registers the count, opens the bag resting on the platform 51 and vibrates the lining of the hopper 44 to distribute the articles in the bag. Furthermore at the same time the clutch 57—59 is closed for this purpose. This operator operates the handle 20 to close the clutch 16—18 and move the feeding conveyer. The operator takes the bags out of the bag holder, and puts them on the platform 51. Another operator sees to the weighing of the bags and sees that they are filled correctly. A third operator controls the treadle 92 and attends to the whole sealing of the bag. The discharge conveyers 84 are controlled automatically in unison with the operation of the Geneva wheel 27 and of course, the operator who starts that into motion also controls the operation of the advance of the bag along the machine toward the discharge end. It will be seen that this machine saves a material amount of labor.

Although we have illustrated and described only one form of the invention we are aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore we do not wish to be limited in this respect but what we do claim is:—

1. In a bagging machine, the combination with a conveyer having division plates extending therefrom to divide the operative strand of the conveyer into compartments adapted to hold approximately the same quantity of materials, and a drum at one end over which said conveyer is adapted to discharge, whereby one of the compartments will be discharged at a time, of a hopper in position for receiving the contents of each compartment of the conveyer, said hopper having a lining, and means for agitating said lining to insure that the contents of one compartment of the conveyer shall be discharged from the hopper before the contents of the next compartment are discharged therein.

2. In a bagging machine, the combination of a hopper for receiving the material to be bagged, a pair of slides under the hopper adapted to come into contact and close the bottom of the hopper, and means for moving said slides apart, said slides having depending plates connected therewith at their inner edges adapted to open a bag when the slides move apart.

3. In a bagging machine, the combination of a hopper for receiving the material to be bagged, said hopper having an inclined bottom with an open portion at the bottom of the several inclines, a pair of slides under the open portion normally closing said bottom, and means for moving said slides apart, said slides having depending plates rigidly connected therewith at their inner ends adapted to open a bag for receiving the materials, said bag being located by hand under the slides when they are closed nearest together with he depending plates inside.

4. In a bagging machine, the combination of a hopper and a pair of slides under it, each having a depending plate for opening a bag having its open end placed around the two plates when they are nearest together, a vibratable lining for the hopper, a foot-treadle, and means operated by

the foot-treadle for drawing the two slides apart and thus opening the bag and for agitating said lining.

5. In a bagging machine, the combination with a hopper and a pair of slides under it, each having a depending plate for opening a bag having its open end placed around the two plates when they are nearest together, of a vibratable lining for the hopper, a counter, a foot-treadle, and means operated by the foot-treadle for drawing the two slides apart and thus opening the bag for agitating said hopper and for operating said counter at the same time.

6. In a bagging machine, the combination with a starting treadle, of a flexible connection operated thereby, a pair of parallel downwardly extending plates adapted to enter the mouth of a paper bag, said flexible connection being divided and opposite ends connected with said plates to separate the plates and open the bag when the treadle is depressed, an operating shaft, a second shaft, a clutch for connecting the operating shaft to the second shaft, said clutch being connected to said flexible connection, whereby when the treadle is depressed the second shaft will be connected with the power thereby, a hopper for the materials to be bagged and an eccentric on said second shaft connected with the hopper for agitating it to discharge the materials therefrom.

7. In a bagging machine, the combination of a constantly operating shaft, a gear wheel, means for connecting said gear wheel with the constantly operating shaft at will, said gear wheel having a pin, a Geneva wheel operated by said pin, a shaft on which the Geneva wheel is fixed, whereby the last named shaft will operate a definite part of a revolution and then stop at each complete rotation of said gear wheel, a conveyer operated by the last named shaft for feeding the materials into the machine, means for guiding the materials from the conveyer into a bag placed in proper position therefor, a discharge conveyer connected with the last named shaft to be operated thereby and provided with pushing plates arranged to stand substantially perpendicular to the operative strand of the discharge conveyer and in position to push the bag from its filling position, and a weighing scale pan in position to receive the bag from the first named position at each operation of the discharge conveyer.

8. In a bagging machine, the combination of a Geneva wheel, means for operating the Geneva wheel through a definite portion of a revolution at each operation, a feeding-in conveyer for the materials to be bagged connected with the Geneva wheel and adapted to be moved at each motion of the Geneva wheel a definite distance to discharge a definite amount of material into a bag located in position to receive it, a discharge conveyer connected with the Geneva wheel to be operated a definite distance at each operation of the Geneva wheel, said discharge conveyer having pusher plates adapted to come into position to move a filled bag from its filling position, a scale pan in position to receive the filled bag therefrom and the Geneva wheel being connected with the discharge conveyer in such a way that the conveyer will stop when a bag is moved from receiving position to the scale pan, and a platform in position to receive the bag from the scale pan when moved therefrom at the next operation of the delivery conveyer.

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