

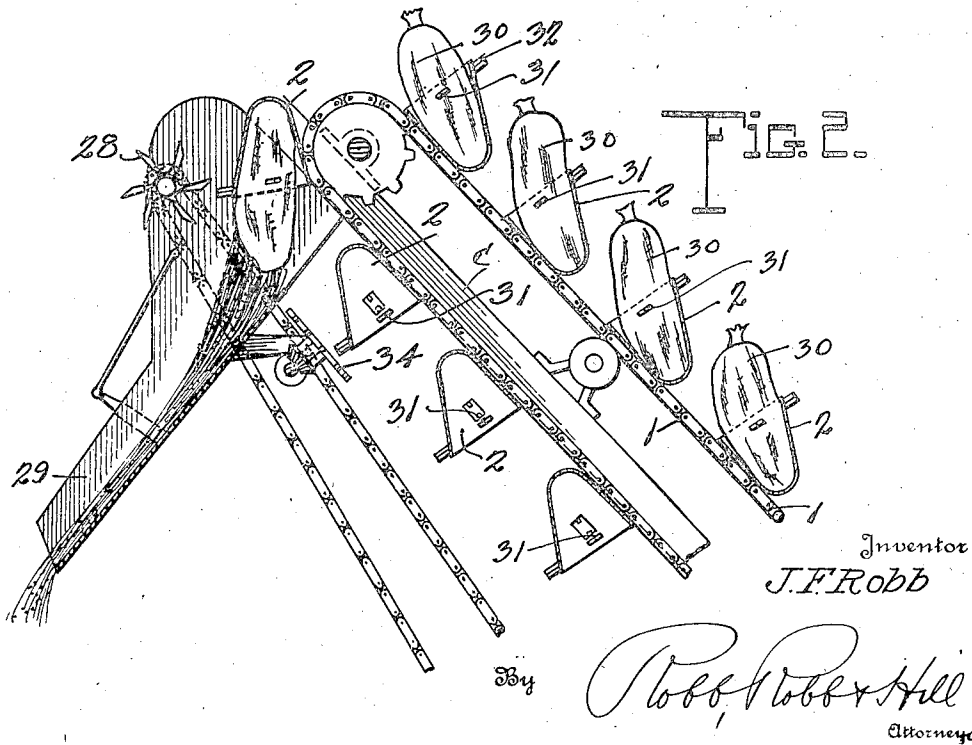
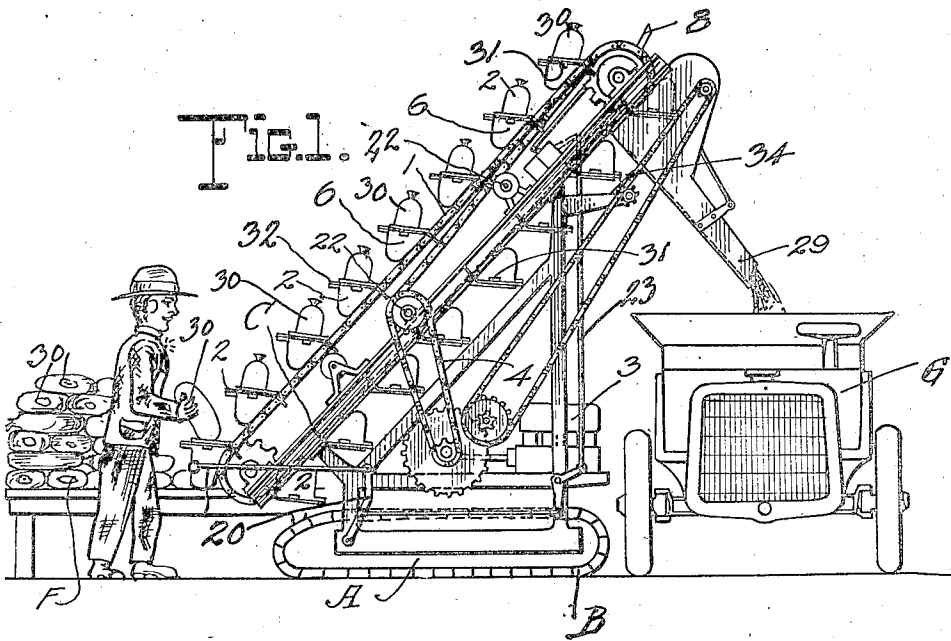
July 4, 1933.

J. F. ROBB

1,916,531

CEMENT LOADER, BAG COUNTER AND INDICATOR FOR BATCH MIXING APPARATUS

Original Filed Oct. 22, 1925 4 Sheets-Sheet 1



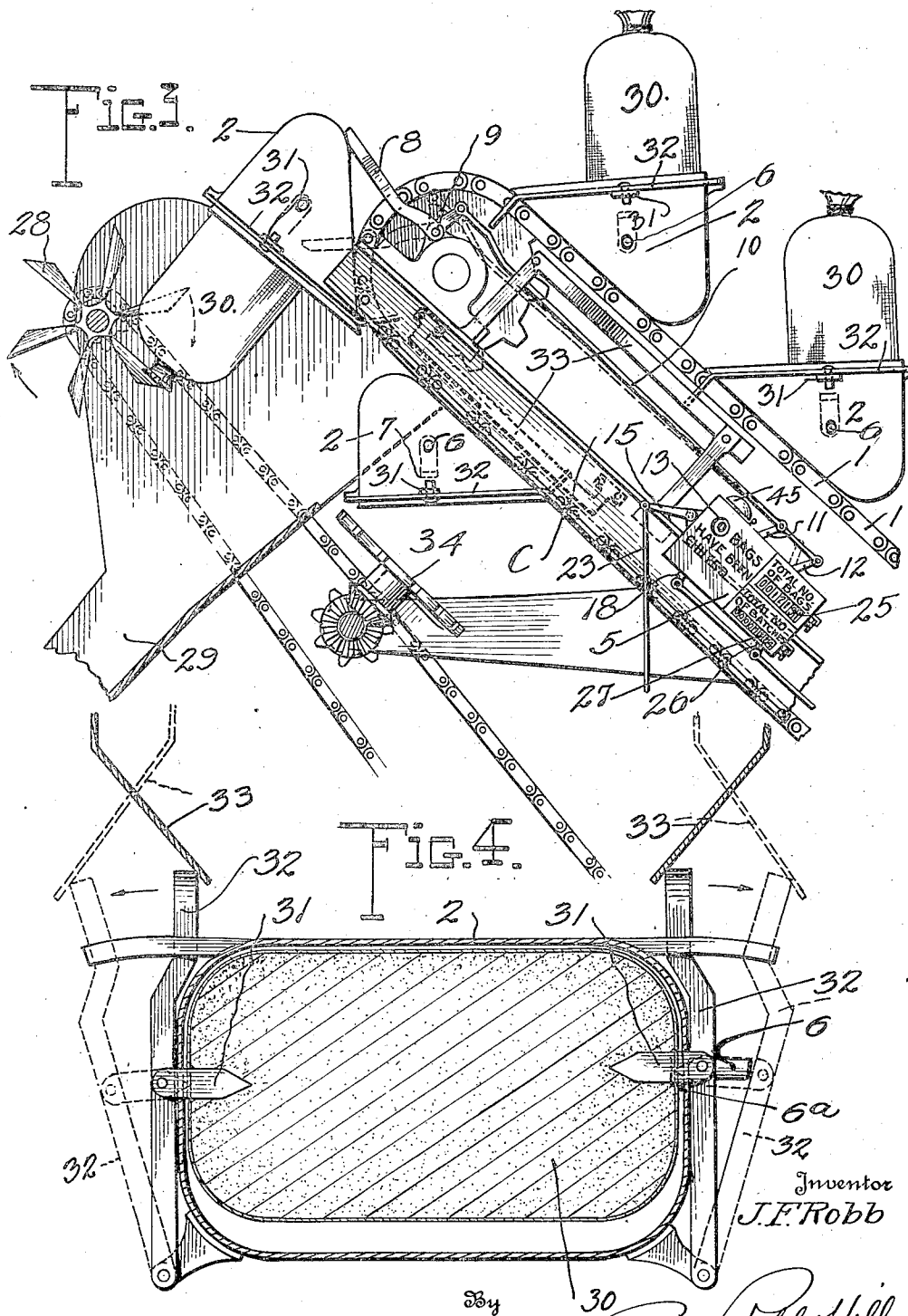
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CEMENT LOADER, BAG COUNTER AND INDICATOR FOR BATCH MIXING APPARATUS

Original Filed Oct. 22, 1925 4 Sheets-Sheet 2



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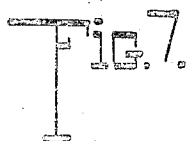
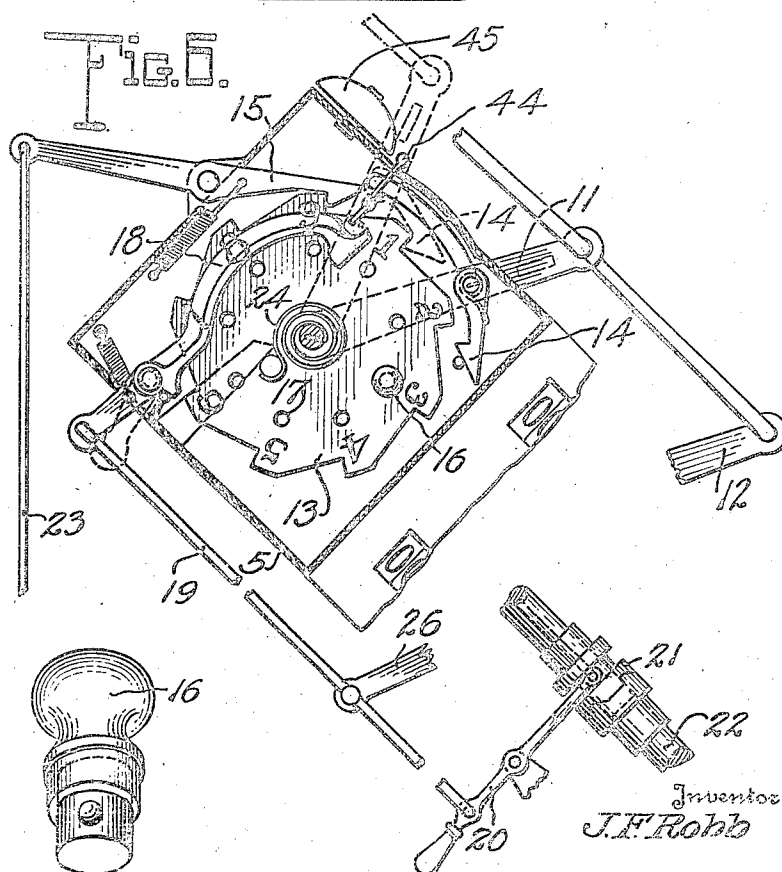
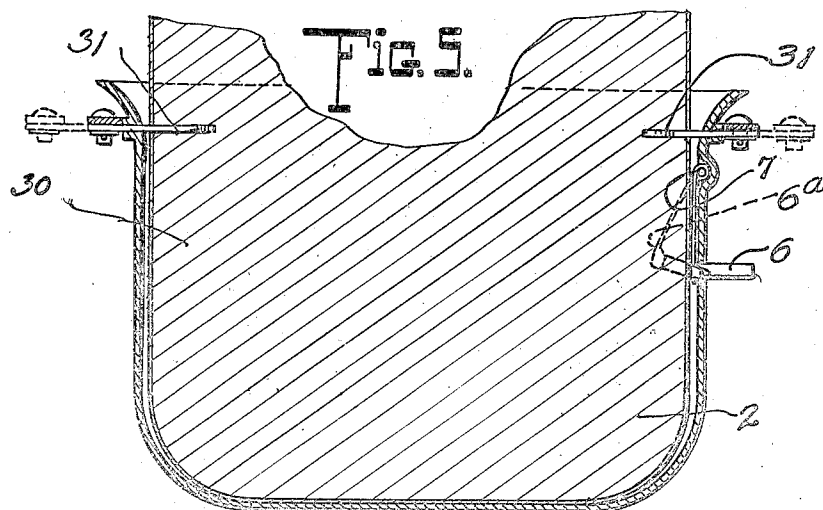
July 4, 1933.

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1,916,531

CEMENT LOADER, BAG COUNTER AND INDICATOR FOR BATCH MIXING APPARATUS

Original Filed Oct. 22, 1923 4 Sheets-Sheet 3



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July 4, 1933.

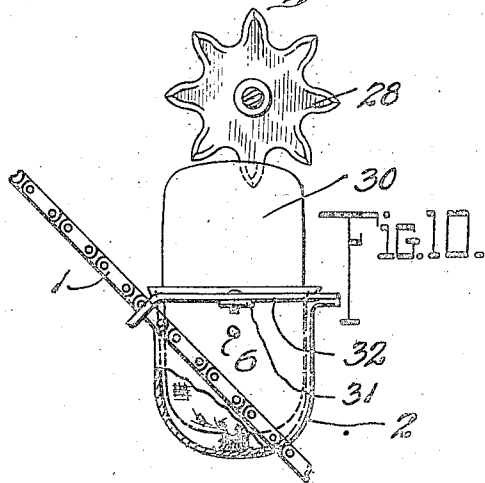
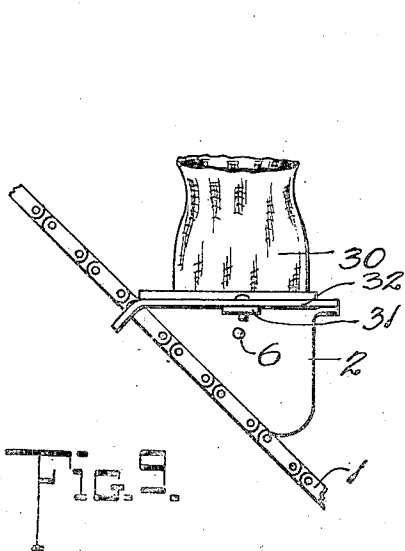
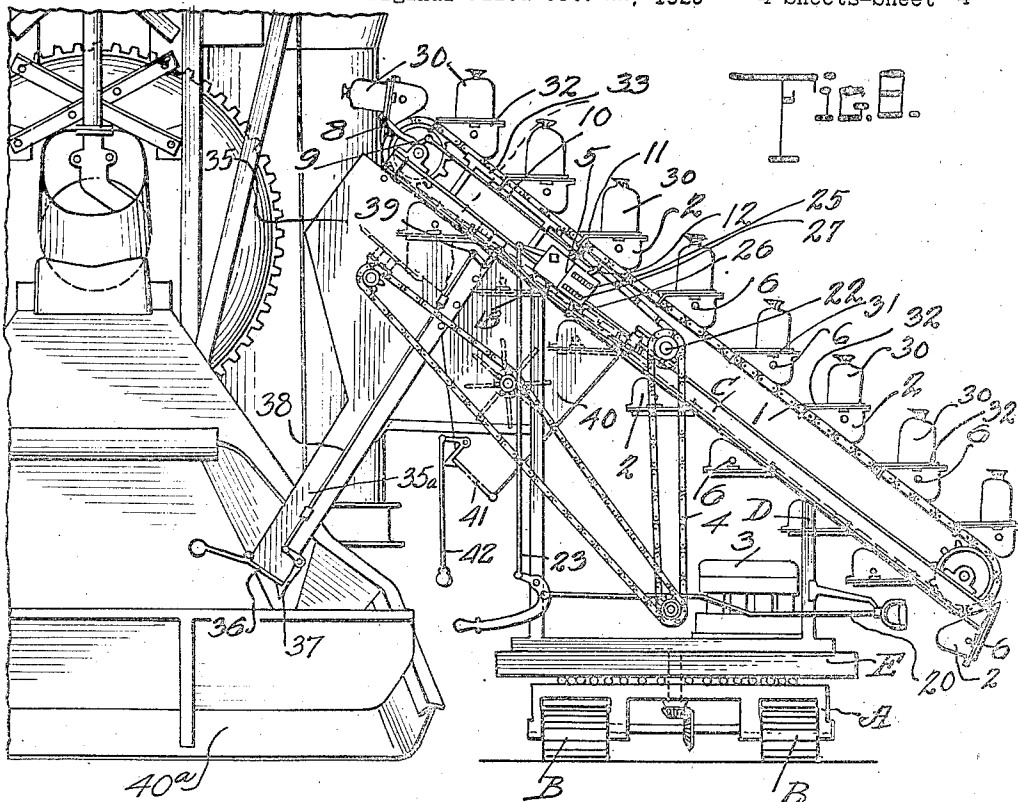
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1,916,531

CEMENT LOADER, BAG COUNTER AND INDICATOR FOR BATCH MIXING APPARATUS

Original Filed Oct. 22, 1923

4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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CEMENT LOADER, BAG COUNTER AND INDICATOR FOR BATCH MIXING APPARATUS

Application filed October 22, 1925, Serial No. 64,229. Renewed December 1, 1932.

The machine of this invention is designed for handling cement and its utility will be appreciated fully upon an explanation of the present method of using large quantities of cement in road building operations.

are being taken to insure a proper water content for the mixed aggregates, and to insure the mixing of the aggregates a proper length of time, but little or no protection exists in respect to the accuracy of the cement proportion which is dependent upon the mere count of the men looking after the cement dumping, and there is no accurate record whatever kept. If cement is skimmed a saving is effected by the contractor and a loss is sustained by the public in the production of weak constructions.

The second reason of objection to the present mode of cement mixing and dumping is the large expense incident to the manual handling or labor. Where two or three men are employed in cement handling alone, the labor cost becomes excessive in the working season for obvious reasons.

The machine of this invention is designed to handle the cement mechanically by way of elevating the same in bags, automatically cutting the bags open, automatically counting the total number of bags used, and automatically registering the number of batches of bags handled which is the same as the number of batches of total aggregates supplied to the paving machine.

My machine is equally adapted for loading the cement into trucks containing the remaining aggregates, or the machine may be used near to the paving machine itself for supplying the cement directly into the loading skip of said machine, while the sand and stone aggregates are being brought up.

By the use of my machine I eliminate the necessity of employing at least one and in many instances two cement men, because a single workman can operate my machine, his work being confined to the placing of the bags of cement in the conveyer buckets of the endless conveyer feature of the machine, and pulling a lever to start the machine into action. The machine will stop automatically when the required number of bags of cement are cut open and dumped mechanically.

By consulting the permanent register of number of bags used and batches of cement handled an inspector may easily determine whether a proper quantity of cement has

The ordinary road building operation of average size involves the use of what is known as a concrete paver. To this paver are supplied the concrete aggregates of stone or gravel, sand, and cement. The cement for each batch of aggregates fed to the mixer of the paver comprises a quantity which may range from two to six bags, usually, dependent upon the size of the paving machine. A common method of supplying the aggregates to the paving machine is to provide on a loading platform adjacent to the site of the work a large number of bags of cement ready to be used. A motor truck into which is loaded the heavy aggregate and sand will be driven along-side the loading platform, a man will step from the platform into the truck, and a second man will lift the bags of cement from the platform to the man in the truck, the bags having been previously cut open. The man in the truck will then dump the contents of the bags handed to him on top of the aggregates already in the truck, get off of the truck and back on to the platform whereupon the truck will drive off to the paving machine. The lifting of the bags of cement is arduous work and many contractors find it desirable to employ three men at this work as it is found good policy to have one man ready to spell the other men on the cement.

The foregoing method of handling cement for road or street paving work is objectionable for at least two important reasons. The primary reason is that there is no accurate count of the bags of cement which are dumped into the truck and ultimately go to the mixer as a part of the bags of aggregates.

The proposition of accurate cement measurement is one of growing importance in the art. The making of good concrete pavement or similar work depends more upon the accurate measurement of the cement than upon any one factor entering the mixing operation. At the present time great precautions

been supplied to the mixing machine for its mixing operations, comparing the same with the paver's batch-meter.

Moreover in the carrying out of my invention I utilize an endless conveyer type of machine which is adapted to be employed for ordinary conveying work, such as sand or gravel elevation and loading work, after the manner of a well known class of conveyers at present in use.

Under these conditions therefore my cement loading, measuring and counting machine is susceptible of ready use for general loading work independently of its employment for cement handling, if the owner of the machine has such work to be done. With the use of my machine it is unnecessary to erect the relatively high cement loading platforms now in use because the cement in bags may be laid just slightly above the ground on boards suitably placed. Saving is accomplished in this respect therefore aside from the labor item and ignoring the advantages of accurate cement control which is a most important feature of the invention.

As the permanent register of number of bags and batches of cement may be locked against tampering the reliability of my machine in this connection is insured.

Among other features of my invention are provisions for preventing the operation of the bag registering means unless a bag of cement is actually carried in a conveying bucket; the provision of means for engaging the bags of cement to hold them in the conveyer buckets when inverted ready for dumping; and the provision of a special type batch hopper for the conveyer so that if desired the cement may be dumped into the hopper where it will be collecting until sufficient bags are emptied, the entire quantity of a batch being subsequently discharged.

My invention will be understood in reference to the following description, in connection with the accompanying drawings, in which:

Figure 1 is a side elevation showing the machine as when used for supplying motor vehicles with cement, the machine operating in conjunction with a cement loading platform.

Figure 2 is an enlarged sectional view of the upper portion of the conveyer machine illustrating the bag cutting means and the striker by which the empty bags are ejected from the buckets.

Figure 3 is a side view of the upper portion of the conveyer machine illustrating more clearly the operating arm and connections by which the register mechanism is controlled.

Figure 4 is a sectional view through one of the conveyor buckets showing the bag penetrating points and the cam mechanism associated therewith.

Figure 5 is a sectional view of one of the conveyor buckets showing the spring retracted register operating finger or arm thereon.

Figure 6 is a sectional view of the register mechanism, the connection between the same, and the clutch mechanism controlling the operation of the conveyer.

Figure 7 is a perspective view of the trip pin 16.

Figure 8 is a view of a modification of the invention, and Figures 9 and 10 are views showing other ways in which the bags may be carried by the converter buckets.

Describing my machine specifically, it is noted that the same comprises a portable traction base A of any conventional type involving preferably endless treads B, though supporting ground rollers may comprise the base if desired. Mounted upon the traction base A is an inclined endless conveyer belt 1 equipped with conveyer buckets 2 which will preferably be of much the same construction as such buckets of the usual type of such conveyers now in use. It is intended however that the buckets 2 shall be of sufficient depth to readily receive bags or sacks of cement placed therein.

The conveyer belt 1 and its buckets 2 will be driven by any suitable motor 3 mounted upon the framework of the machine and connected up therewith as by sprocket chain 4.

The buckets 2 are equipped with mechanism for operating the register means designated 5 in Figure 3. As seen best in Figures 3 and 5 each bucket 2 is equipped with a spring retracted arm 6 carried by a pivot 7 around which a light coiled spring may be disposed to normally tend to hold the arm 6 retracted within the bucket 2. The hanger portion 6^a of the arm 6 will be pushed out when a bag of cement is placed in the bucket 2 and in this way the arm 6 will be projected sufficiently far to cause it to engage a trip lever 8 pivoted at 9 to the upper end of the conveyer frame C. The lever 8 is of bell-crank form having its short arm connected by a rod 10 with the actuating members 11 and 12 of the register 5. The register 5 will preferably comprise a registering wheel 13 to register the number of bags constituting a batch for which the machine is adjusted. Said registering wheel 13 is seen best in Figure 6 being actuated by the member 11 equipped with the operating pawl 14. A detent pawl 15 engages the teeth of the wheel 13 to hold the wheel against return to zero, upon each increment of movement thereof. Each time a bucket 2 filled with a bag of cement passes the arm 8 the retractible arm 6 of the bucket actuates the arm 8 and wheel 13 imparting one increment of movement to the latter. If the bucket 2 is empty no registration actions of the wheel 13, and other registering means to be later described takes place. I provide on the registering wheel 13

a trip pin 16 which is adjustable in any one of a series of openings 17 that correspond with the numbers or digits and teeth provided on the wheel 13. The trip pin 16 is moved by the actuation of the operating member 11 in actuating the wheel 13, and said trip pin 16 is adjustable with respect to a clutch knockout lever 18 connected by a rod 19 with the manual clutch lever 20 which controls the operation of the clutch 21 on the shaft 22 (Figs. 1-8). The shaft 22 is the cross shaft which drives the conveyer belt 1 and the clutch 21 establishes a driving relation between the shaft 22 and said belt. When the clutch 21 is out the conveyer belt 1 and buckets 2 are idle; when the clutch is in the said parts are being driven to feed the buckets upward and bags of cement which may be placed in said buckets. Operation of the knockout lever 18 by the pin 16 throws out the clutch 21 and stops the movement of the conveyer belt 1 and buckets 2.

The detent lever 15 is intended to be actuated by manual means including a rod 23 which leads to a point near where the operator of the machine is at work placing bags of cement in the buckets 2, or it may be operated automatically. By pulling on the rod 23 detent 15 is lifted permitting a spiral spring 24 to return the batch number registering wheel 13 to zero position.

The mechanism of the register 5 operated by the actuating member 12 registers on an accumulator 25 the total number of bags of cement handled by the machine. A lever 26 forms a connection between the rod 19 and a batch registering totalizer or accumulator 27 beneath the accumulator 25. Each time the knockout lever 18 is operated, at the conclusion of the dumping of the required number of bags of cement for a batch, the batch totalizer 27 is operated by lever 26 and registers up the batch handled.

At the upper end of the conveyer mechanism as seen in Figures 2 and 3 I mount a rotary knife 28 which may be driven in any suitable manner from the conveyer devices themselves or from the motor 3. This knife is intended to cut open the sack or bag of cement as it is inverted by the bucket 2 in which it is carried, when reaching the upper end of the conveyer at a point above the discharge chute 29. I preferably use cement in paper bags or sacks so that the bags may be thrown away after being cut open and emptied by my machine. The cement in the usual cotton sacks or bags may be availed of however in which event the knife 28 will be arranged for cutting the bag or sack along a seam thereof enabling it to be readily stitched when repaired, if desired. The cutter 28 may be mounted so as to swing to a position out of use, when the conveyer machine hereof is to be employed for other purposes than cement handling. Again the cutter or knife 28

may be dispensed with entirely, the cement handler who feeds the bags of cement to the buckets 2, cutting the tying string of each bag as he places it in a bucket 2.

As the bags of cement, designated 30 are carried upwardly in the buckets 2, they are inverted at the top of the conveyer mechanism, for dumping operation into the chute 29. To prevent them from dropping out of the bucket as they are inverted I utilize the mechanism as shown in Figure 4 involving a pair of penetrating members 31 movable into and out of each bucket 2 at its opposite ends.

At a certain point in the upward movement of each bucket levers 32 pivotally connect with the penetrating members 31, engage with cams 33 at opposite sides of the conveyer frame C and these cams gradually force the penetrating members 31 to penetrate the bodies of the cement bags and its contents and hold said bag of cement in the bucket 2 as the latter becomes inverted therewith during the cement dumping action in relation to the chute 29 as seen in Figures 2 and 3. Suitable cam means 33 may also be employed to withdraw the penetrating members 31 from the bags after the latter have been emptied and at the same time a bag knocker 34 may be caused to strike the empty bag as it is about to fall out of the bucket 2 by gravity, the bag being thus knocked into a chute discharging it at one side of the machine, or ejected forcibly from either side of the machine. For the last mentioned purposes the knocker 34 may be reversibly driven from the conveyer mechanism of the machine in any suitable manner.

I have shown in Figure 8 a modified form of my machine in which I employ at the upper end of the conveyer mechanism a cement batch hopper 35 having a discharge door 36 normally locked closed by a latch 37 operable by a rod 38. The rod 38 is connected at its upper end to a lever 39 which is attached to the knockout lever 18 previously referred to so as to be operated by the latter to withdraw the latch 37 from a door 36 when the predetermined number of bags of cement which are to make up the batch, have been dumped into the hopper 35. This construction of hopper type machine may be used in order that the required number of bags of cement for a batch may be collected in advance and discharged in one quantity. The construction is best adapted for use where my machine is working close to a concrete paver, the discharging spout 35^a of the hopper being adapted to be moved over the loading skip 40 to feed the cement directly into the skip if desired. In this type of machine I preferably mount the upper framework D of my conveyer mechanism upon a turn table E carried by the traction base A. This construction is very much similar to that of a

rotary crane and need not be described in detail. It permits however of the swinging of the conveyer so as to operate at an angle to the line of movement of the traction base A, or parallel with the line of movement of said base, according to required conditions.

Figure 8 shows how my machine can travel along with the paver somewhat in rear of the latter, leaving the skip of the paver free to be filled with aggregates by the trucks which may be employed to bring up the sand and heavier aggregate material.

With the foregoing understanding of the details of construction of my machine the following is a description of the complete operation of the same as shown in Figure 1. A single cement man will lift the bags of cement from the platform F and keep the buckets 2 of the conveyer belt 1 filled. We will assume that a batch of aggregates to be handled in the mixer or paver will require three bags of cement. In this event the trip pin 16 in Figure 6 is properly adjusted in the third opening 17. If the batch of concrete to be mixed at one time in the mixer required six bags of cement the trip pin 16 would be placed in the sixth opening of the wheel 13 opposite the digit 6. Assuming the truck G is beneath the spout 29 the cement man will pull the manual lever 20 and throw in the clutch 21 causing the conveyer belts 1 and buckets 2 to move upwards like any ordinary conveyer. Each time a bag of cement reaches the inverted position at the top of the conveyer as shown in Figure 3 it is emptied into the chute 29, or the hopper 35, as the case may be. Its movement is registered on the accumulator 25 of the register 5, which accumulator counts the individual bags; likewise its movement actuates the bag counting wheel 13 and moves said wheel one increment or the length of one of its teeth. When three bags of cement which are required to make up the cement portion of the batch have been emptied, the trip member 16 strikes the knockout lever 18, and stops the movement of the conveyer belt 1 by throwing out the clutch 21 at the same time the knockout lever 18 actuates the batch counter or totalizer 27 and registers up a batch count on said totalizer. The machine now remains inactive until the operator again starts it into action by moving the lever 20 and throwing in the clutch 21. While the operator, by actuating the rod 23 may cause restoration to zero of the batch counting wheel 13, provision may be made to do this automatically.

While I have shown certain preferred forms of my invention in the two machines illustrated I do not wish to be limited strictly thereto because so far as I am aware my invention broadly consists in a cement handling machine of a general class presented wherein the bags of cement as supplied to the trade are handled for the purposes of empty-

ing them in predetermined numbers into a suitable receptacle, whereby accurate count of the bags is kept in addition to the count of the batches made up by a predetermined number of said bags. By these means I have obtained a machine especially useful for accurately handling the cement or batches of concrete aggregates supplied to mixing machines of various kinds, both for paving work and building construction work.

If desired, there may be provided, as shown in Figure 8, a bag hopper 40 which will receive the bags as they are knocked free of the buckets by the bag knocker expeller. The bags may be removed from the hopper 40 through a door 41 by unlatching said door through operating means 42.

According to the machine of construction of Figure 8, it is contemplated that when the batch of cement is to be discharged into the paver skip 40, the turn table E of the machine will be swung to carry the discharge of the hopper 35 and the conveyor mechanism is swung about ninety degrees to carry the hopper from the position above the skip 40 to a position out of the way of the skip as it ascends to charge the drum of the mixer. Any customary swing control mechanism such as used in cranes may be employed in accomplishing the above result.

By referring to Figures 9 and 10, it will be seen that Figure 9 shows a bag of cement as placed in one of the conveyer buckets after the tie strings at the mouth of the bag have been cut open. This may be one method of handling the bags for purposes of opening the same so that the bags will not be mutilated in any way by an automatic cutting mechanism that might be used very well for paper bags holding cement, or even the ordinary cotton sacks.

As regards Figure 10, there is illustrated the bag of cement placed in the bucket in inverted position, mouth downward, and the rotary cutter arranged to slit or cut the bag open at its bottom in a place where it is very easy to stitch the bag up again, if it is a cloth bag, so as to permit of its re-use.

As shown in Figure 6, each time the knockout lever 18 is operated at the completion of a discharge of a predetermined batch of cement, said lever strikes and operates a bell tapper 44 which operates a gong or bell 45 that acts as an indicator to advise those adjacent to the machine that a complete batch of cement has been discharged, the same representing a certain number of bags of course.

It will be understood that in effect the buckets 2 of the conveyer are holding means for the bags of cement and the penetrating members 31 are gripping means for said bags. Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a machine of the class described, in

combination, a device for elevating bags of cement, operating means therefor, and means controlling said operating means so that the elevating device will carry a predetermined number of bags of cement to a dumping point, then stop, the predetermined number of bags carried to the dumping point representing a measured batch for a batch of concrete aggregates, and means cooperating with said elevating device for counting the measured batches handled thereby, and means for counting each bag of cement brought to the dumping point by the elevating device.

2. A cement loading and batch measuring machine, comprising a movable conveyer, holders on said conveyer to receive measured amounts of cement, means for operating the conveyer to carry said amounts of cement to a dumping point, and means for stopping said conveyer when a predetermined number of said amounts of cement have reached the dumping point, and a device for registering each stopping action of the conveyer.

3. A cement loading and batch measuring machine, comprising a movable conveyer, holders on said conveyer to receive individual bag quantities of cement, means for operating the conveyer to carry said quantities of cement to a dumping point, means for stopping said conveyer when a predetermined number of bag quantities of cement have reached the dumping point, a device for registering each stopping action of the conveyer, and a device for counting the number of bag quantities of cement brought to the dumping point, by said conveyer.

4. In a cement batch measuring and counting machine, a movable conveyer adapted to hold individual bags of cement and feed the same to a dumping point therefor, means for gripping the bags of cement to hold the same while being dumped, and means for operating the conveyer to feed only a predetermined number of bags of cement to the dumping point and then automatically stop it, and means for registering the stopping movements of the conveyer for enabling the number of batches of cement handled by the conveyer between its stopping movements to be determined.

5. In a cement batch measuring and counting machine, a movable conveyer adapted to hold individual bags of cement and feed the same to a dumping point therefor, means for gripping the bags of cement to hold the same while being dumped, means for operating the conveyer to feed only a predetermined number of bags of cement to the dumping point and then automatically stop it, means for operating the gripping means to release the cement bags after dumping or discharging, and means for forcibly ejecting the bags for cement from the conveyer after said bags are dumped.

6. A machine for mechanically handling

bags of cement, counting them, and emptying them, including a movable conveyer having cement bag holding means, means to operate the conveyer to invert the bags to discharge them, means for causing the conveyer to move to supply a predetermined number of bags of cement to the discharging point, means for stopping the movement of the conveyer when the predetermined number of bags of cement have been brought to the discharging point and discharged, and a cement bag cutting device located at the discharging point and arranged to cut open each bag of cement as it reaches the discharging point.

7. A machine for mechanically handling bags of cement, counting them, and emptying them, including a movable conveyer having cement bag holding means, means to operate the conveyer to invert the bags to discharge them, means for causing the conveyer to move to supply a predetermined number of bags of cement to the discharging point, means for stopping the movement of the conveyer when the predetermined number of bags of cement have been brought to the discharging point and discharged, and a cement bag cutting device located at the discharging point and arranged to cut open each bag of cement as it reaches the discharging point, and means for registering the stopping movement of the movements of the conveyer after each predetermined number of bags of cement have been carried to the discharging point to enable the number of batches of cement represented by each predetermined number of bags discharged, to be determined at any time.

8. A machine for mechanically handling bags of cement, counting them, and emptying them, including a movable conveyer having cement bag holding means, means to operate the conveyer to invert the bags to discharge them, means for causing the conveyer to move to supply a predetermined number of bags of cement to the discharging point, means for stopping the movement of the conveyer when the predetermined number of bags of cement have been brought to the discharging point and discharged, a cement bag cutting device located at the discharging point and arranged to cut open each bag of cement as it reaches the discharging point, and means for registering the stopping movement of the movements of the conveyer after each predetermined number of bags of cement have been carried to the discharging point to enable the number of batches of cement represented by each predetermined number of bags discharged, to be determined at any time, and means at such time for counting the individual bags of cement.

9. In a cement batch measuring machine, a conveyer adapted to receive and carry forward to a discharging point bags of cement,

means for automatically stopping the conveyor when a certain number of the bags of cement have reached the discharging point, said predetermined number of bags of cement representing a measured batch, and means to register each batch of cement so supplied to the discharging point.

10. In a cement batch measuring machine, a conveyor adapted to receive and carry forward to a discharging point bags of cement, means for automatically stopping the conveyor when a certain number of the bags of cement have reached the discharging point, said predetermined number of bags of cement representing a measured batch, means to register each batch of cement so supplied to the discharging point, said conveyor comprising buckets having bag gripping means to hold the bags of cement while discharging, and means for releasing said bags after being discharged.

11. A cement batch measuring machine, comprising an endless conveyor having buckets to receive the bags of cement, means for registering the bags of cement handled by the conveyor and including devices carried by the buckets adapted to operate the registering means only when the buckets have bags of cement disposed therein, gripping means to engage the cement bags carried by the buckets to hold the latter while they are being discharging and to then release them, and bag discharging means located at a suitable discharging point in the length of the movement of the conveyor.

12. A cement batch measuring machine comprising an endless conveyor having buckets to receive the bags of cement, bag penetrating means on the buckets for gripping the bags to hold the same when they are inverted combined with means operable automatically to release them, means for cutting the bags open at a predetermined point in the movement of the conveyor and before the said penetrating means releases the bags, and means for mechanically removing the bags from the buckets after discharge of said bags.

13. A cement batch measuring machine comprising an endless conveyor having buckets to receive the bags of cement, bag penetrating means on the buckets for gripping the bags to hold the same when they are inverted combined with means operable automatically to release them, means for cutting the bags open at a predetermined point in the movement of the conveyor and before the said penetrating means releases the bags, means for moving the conveyor to bring a predetermined number of bags to the discharging point to represent a predetermined batch of cement, and for then stopping the conveyor, and means for registering each of the said batches of cement.

14. A portable cement measuring machine comprising an endless conveyor having

buckets to receive bags of cement, means for moving the conveyor to carry a predetermined number of bags of cement representing a batch to a dumping point, means for discharging bags of cement at said dumping point, means for stopping the movement of the conveyor after said predetermined number of bags of cement have been dumped, and a traction base for the machine, a cement batch hopper to receive the cement from the conveyor, means to discharge said hopper when it has received a batch of cement, a bag receiver, and means for ejecting the bags to carry them into the bag receiver after the bags have been discharged.

15. A portable cement measuring machine comprising an endless conveyor having buckets to receive bags of cement, means for moving the conveyor intermittently to carry a predetermined number of bags of cement representing a batch to a dumping point, a cement batch hopper to receive the cement at the dumping point, and means for discharging the batch hopper automatically when a batch of cement as above characterized has been received in the hopper, and means for registering a number of batches of cement discharged by the hopper.

16. In a machine for mechanically handling bags of cement and emptying them including a movable conveyor, means to operate said conveyor, to carry the bags of cement to a discharging point, said conveyor comprising means to effect discharge of the bags at such discharging point, a hopper for receiving the contents of a predetermined number of bags at the discharging point, and means to stop the movement of the conveyor when such predetermined number of bags have reached and been discharged into said hopper, and means to automatically discharge the batch hopper when a predetermined number of bags of cement constituting a batch have been discharged thereinto.

17. A machine for mechanically handling bags of cement and discharging them, comprising a movable conveyor, bag holding means carried by said conveyor to cooperate with bags of cement for carrying the same to a point of discharge, means at the point of discharge for said bags for cutting each bag open to cause emptying of the same as it reaches the discharge point, and means for discharging the bags from the machine after they are cut open and emptied.

18. In a machine for measuring cement to provide predetermined quantities of cement for batches of concrete, a conveyor, operating means therefor, means for initiating the movement of the conveyor when loaded with cement to carry the latter to a point of delivery, and instrumentalities to automatically stop the conveyor when it has delivered a predetermined quantity of cement to the delivery point, combined with a hopper at the

delivery point of the conveyer to receive the cement measured by the conveyer, and means automatically to discharge the hopper when supplied with a predetermined quantity of cement upon stopping of the conveyer.

19. In a machine for measuring cement to provide predetermined quantities of cement for batches of concrete, a conveyer, operating means therefor, means for initiating the movement of the conveyer when loaded with cement to carry the latter to a point of delivery, and instrumentalities to automatically stop the conveyer when it has delivered a pre-

determined quantity of cement to the delivery point, combined with a hopper at the delivery point of the conveyer to receive the cement measured by the conveyer, means automatically to discharge the hopper when supplied with a predetermined quantity of cement upon stopping of the conveyer, and means to register the number of discharging operations of the hopper and thereby to count the batches of cement passing from the hopper.

In testimony whereof I affix my signature.

JOHN F. ROBB.

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20	85
25	90
30	95
35	100
40	105
45	110
50	115
55	120
60	125
65	130