May 19, 1931. S. SHAFER, JR 1,805,602

CONCRETE DELIVERY APPARATUS

Filed March 15, 1929

Fig. 1

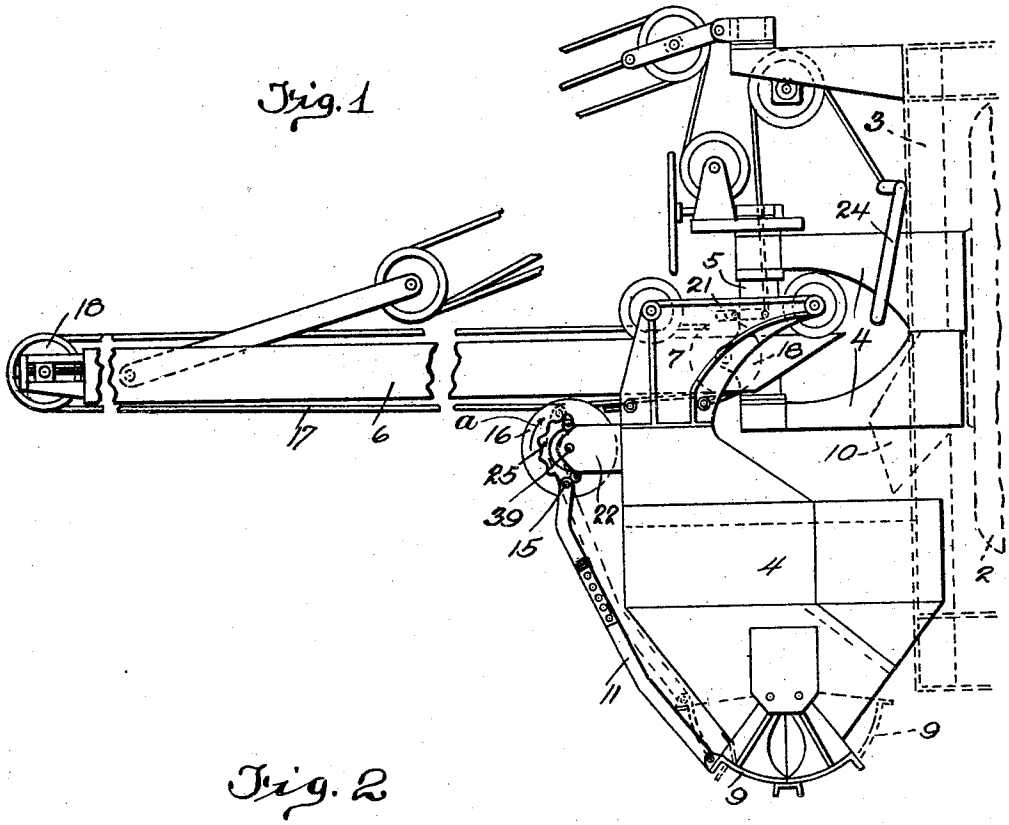


Fig. 2

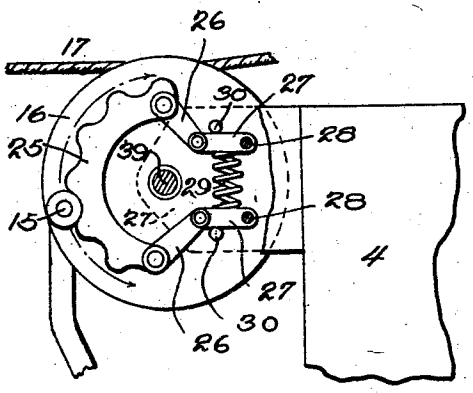
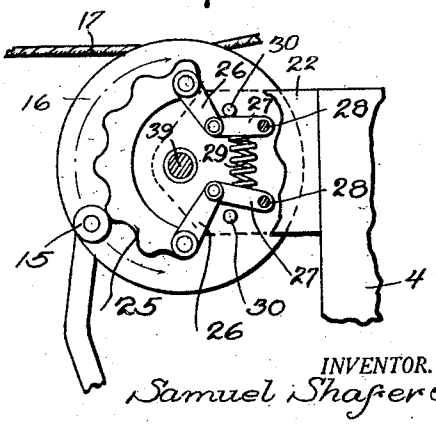


Fig. 3



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Patented May 19, 1931 1,805,602

UNITED STATES PATENT OFFICE

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CONCRETE DELIVERY APPARATUS

Application filed March 15, 1929. Serial No. 347,409.

The invention relates to a conveying and distributing apparatus in which is employed a bucket or other movable receptacle that is adapted to travel along a track or way, and which is provided at its bottom with a door or doors through which the contents of the receptacle may be discharged; and has for its object to improve such apparatus in the particulars hereinafter pointed out. The invention has been devised with special reference to use in connection with bucket and boom concrete distributing mechanism constituting part of a street and paving machine. It is not however necessarily limited in its useful applications to machines of this character.

In Patent 1,290,537 to Donald Fraser there is illustrated a conveying and distributing apparatus of the type to which my invention relates.

In the accompanying drawings, Figure 1 is a side elevation of apparatus embodying the invention.

Fig. 2 is a detailed view, on a larger scale than Fig. 1 illustrating those parts of the apparatus in which novelty resides and embodying the invention.

Fig. 3 is a view similar to Fig. 2 except that the parts are represented in different positions.

In the drawings 2 indicates in outline the discharge end of a concrete mixing drum that is supported in a framework 3 constituting a part of a road-paving machine. A bracket 4 is carried by the framework and in this is mounted the vertical pivot 5 of a swinging boom 6 that is mounted for both horizontal and vertical adjustments. The boom is constructed to constitute a track along which moves a carriage or trolley 7 from which is suspended a bucket 8 that is adapted to receive the mixed concrete from the drum 2, through a discharge or delivery chute 10. The concrete being so delivered, the bucket is moved outward along the boom, to the place of delivery. The bucket is represented as being of the bottom discharge type and is provided with a door 9, or preferably with a pair of doors as represented in the drawings.

The means for causing the traverse of the bucket along the boom are not illustrated, as such means may be of usual or preferred construction constituting no part of the present invention.

For opening the doors to permit the discharge of the bucket manually controlled mechanism of the type illustrated in the aforesaid Fraser patent is employed.

11 indicates a link connecting one of the doors 9 with a sheave or pulley 16 supported in a bracket 22 located at the forward end of the bucket near its top edge. To this sheave is connected, being preferably wound about its periphery, a free-running, endless cable 17, that extends forwardly from the sheave and passes about a pulley 18 supported at the outer end of the boom, from whence it turns and passes rearwardly and around another pulley 18 supported in the rear end of the boom, from which the cable returns to the sheave 16. It will be understood that as the trolly 7 is moved back and forth along the boom, carrying with it the bucket and the sheave 16, the cable 17 runs freely, by reason of its connection with the sheave, so long as it is unrestrained. If however it is arrested in its movement, as for instance on the outward run of the trolley and bucket the sheave will be turned on its supporting axis 39 in the direction of the arrow *a*, Fig. 1, and this will move the link 11 and through it open the door or doors of the bucket. In order to arrest the free movement of the cable 17 a brake 21, operated through manually controlled means 24, is arranged to bear upon the pulley 18 at the inner end of the boom stopping its free movement, and this in turn stops the cable and so turns the wheel or sheave 16.

The parts thus far described do not constitute the present invention but form the basis of pending applications for patent filed by me respectively, August 17, 1926 and April 27, 1927, which applications have respectively matured into patents numbered 1,732,207, dated October 15, 1929 and 1,729,553, dated September 24, 1929.

It is often desirable in operating apparatus such as described to be able to control the extent to which the door of the bucket or receptacle 8 is opened and to maintain the same in that desired position, and the present

invention is directed to the attainment of this object.

The end of the link 11 that is connected to the wheel or sheave 16, at 15, travels in an arcuate path, indicated in broken lines in Figs. 2 and 3, as the sheave is turned on its support 39. 25 indicates a member that is mounted adjacent to the said path of movement of the end 15 of the link 11. The member 25 is of segmental shape with a sinuous outer edge against which the aforesaid end of the link 11 bears, and is supported so as to be held in yielding and frictional engagement with such end of the link. Each end of the segmental piece 25 is connected with the bracket 22 by linkage 26 and 27, the links 27 being each pivotally connected, at 28, to the bracket, and such links being preferably disposed parallel to each other with a spring 29 between them tending to force them apart and against stops 30. The mounting just described causes the segmental member 25 to be held yieldingly, the spring 29 tending to separate the links 27 and so hold the segmental piece in its normal position. As the sheave 16 is being turned in the direction of the arrow *a* (Fig. 1), upon arresting the free movement of the cable 17 as has been described, the end of the link 11 successively passes the high points of the outer edge of the member 25 and in so doing successively moves the latter back or toward the axial center of the sheave, as represented in Fig. 3 of the drawings, forcing the links 27 toward each other and putting the spring 29 under compression. As the end of the link passes a high point of the edge of the holding member 25 and enters one of the depressions between such high points the parts return to normal position, as indicated in Fig. 2, and the force of the spring 29 is sufficient to cause the frictional engagement of the holding member with the end of the link 11 to maintain the link and the door or doors with which it is connected in the position which they occupy when the turning movement of the sheave 16 ceases.

In order to close the door or doors of the bucket or receptacle the brake 21 is applied during the reverse or inward run of the trolley and bucket to cause a movement of the sheave in a direction the reverse of that indicated by the arrow *a* (Fig. 1). This movement should be just sufficient to cause the projection that is carried by the sheave,—the end 15 of the link 11 in the construction illustrated—to clear the holding element 25, after which the door or doors will close by gravity in an arrangement such as illustrated in the drawings.

It will thus be seen that there is provided mechanism by which the operator can accurately control the extent to which the door 9 may be opened so as to permit a rapid or a slow discharge of the contents of the bucket, and that upon the release of the brake or the stoppage of the traverse of the bucket the door will be held by the means described in the open position to which it has been moved.

The control mechanism which has been described constitutes a self set or ever set device that operates to maintain the door in the position to which it may be opened. This ever set mechanism is combined with manually controlled means by which the operator may, through the application of the brake 21, determine just how far the door shall be opened; and it operates instantly and automatically, upon the release of the brake, to hold the door in its opened position. The terms "ever set" or "self set" are here employed to indicate that the device is always set or ready to act, regardless of the extent to which the doors may have been opened; in other words, it is entirely automatic and does not have to be manually set for arresting the opening of the door at a particular point, as would be the case with a manually controlled adjustable stop. The ever set door holding device always acts to restrain or oppose the free movement of the sheave 16, but its restraining effect is not sufficient to stop the turning of the sheave,—and hence the movement of the door,—when the brake 21 is applied while the bucket is being traversed, although, when the brake is released its power is sufficient to maintain the door in the position to which it may have been moved.

There has been described a specific form of mechanism well adapted to the purposes for which it is intended but the invention is not to be limited to the specific mechanism described and shown as that may be changed within wide limits as long as it operates as, and accomplishes the results, herein described. The invention is therefore not to be limited beyond the express terms of the claims hereof.

What is claimed is:

1. The combination with a conveying receptacle provided with a door through which its contents may be discharged and a track along which it may travel, of a free-running cable that moves as the receptacle moves along the track, means through which the cable may be connected with the door of the receptacle for opening the latter, means for arresting the free movement of the cable to open the door and means whereby the door will be maintained in the open position it occupies when the restraint on the free movement of the cable is removed.

2. The combination with a conveying bucket provided with a bottom-opening door, an elevated track and a trolley on the track from which the bucket is supported, of means by which the door may be opened for discharge of the contents of the bucket, a free-running cable connected with the said door opening means, means under manual control

for arresting the free movement of the cable for a limited period, thereby opening the door to the desired extent, and ever set means for holding the door in the position to which it is opened.

3. The combination with a conveying bucket provided with a bottom-opening door, an elevated track, a trolley from which the bucket is suspended movable back and forth on the track, of means movable with the bucket and trolley and connected with the door through which the latter may be opened, a free-running cable supported along the said track and connected with the means for opening the door, manually controlled means for arresting the free movement of the cable to cause the door to be opened and ever set frictionally operating means for maintaining the door in the position to which it has been opened and operating upon the release of the means that retard the free movements of the cable.

4. The combination of a conveying receptacle provided with bottom-opening doors, a track along which the receptacle may move, a pivoted member movable with the receptacle having connection with the door through which the latter is opened, a free-running cable supported adjacent to the track and connected to the said pivoted door-opening member, means for arresting the free movements of the cable to cause the operation of the door-opening means and ever set, automatically operating means located adjacent to the door-opening member with which the latter engages, for holding the same in the position to which it may be moved by retarding the movement of the cable, whereby the door is maintained in the open position to which it is moved through the control of the said cable.

5. The combination of a conveying receptacle provided with bottom-opening doors, a track along which the receptacle may move, a sheave supported by the receptacle, a link connecting the sheave with the door, a free-running cable supported adjacent to the track and connected with the sheave, means under manual control for arresting the free movement of the cable whereby the sheave is caused to turn and the door to be opened, a segmental member supported adjacent to the sheave, and a projection carried by the sheave for engaging the segmental member and maintaining it in the position to which it may be moved upon the arresting of the free movements of the cable.

6. The combination of a conveying receptacle provided with bottom-opening doors, a track along which the receptacle may move, a sheave supported by the receptacle, a link connecting the sheave with the door, a free-running cable supported adjacent to the track and connected with the sheave, means under manual control for arresting the free movement of the cable whereby the sheave is caused to turn and the door to be opened, a segmental member formed with a sinuous edge, linkage supporting the segmental member so that it may move toward and from the pivotal center about which the sheave turns, a spring acting on the said linkage for yieldingly holding the segmental member in its outermost position and a projection carried by the sheave engaging the sinuous edge of the segmental member.

7. The combination, with a conveying receptacle provided with a door controlling discharge of the receptacle, a track and means for traversing the receptacle back and forth along the track; of manually-controlled means whereby the door may be gradually opened while being traversed, and automatic, ever set means for maintaining the door in the position it occupies when the door-opening means cease to operate.

8. The combination, with a conveying receptacle provided with a door controlling discharge of the receptacle, a track and means for traversing the receptacle back and forth along the track; of manually-controlled means whereby the door may be gradually opened while being traversed and automatic, ever set means operating in combination with the door opening means to oppose the free movement thereof with a force less than that applied thereto when under manual control to open the door, but arranged to prevent movement of the door-opening means when not under manual control.

In testimony whereof I affix my signature.

SAMUEL SHAFER, JR.

CERTIFICATE OF CORRECTION.

Patent No. 1,805,602. Granted May 19, 1931, to

SAMUEL SHAFER, JR.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, after line 109, insert the following as claim 1:

1. The combination with a conveying receptacle provided with a door through which its contents may be discharged and a track along which it may travel, of means by which an operator may control the extent to which the door will be opened for discharge, and an ever set mechanism for maintaining the door in the position to which it is so opened.

The claims now appearing in the patent as numbers 1, 2, 3, 4, 5, 6, 7 and 8, should bear the numbers respectively 2, 3, 4, 5, 6, 7, 8 and 9; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 7th day of July, A. D. 1931.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)