J. H. MacLAUCHLAN.

DELIVERY MECHANISM.

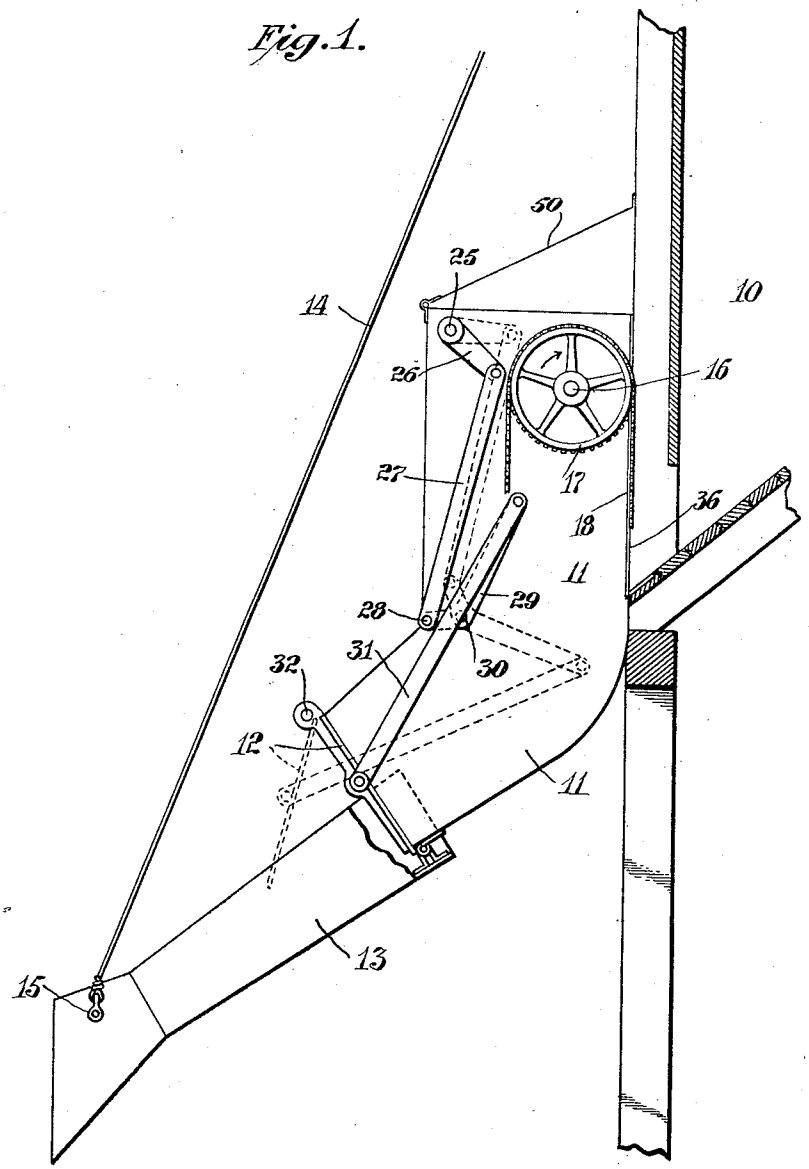
APPLICATION FILED FEB. 5, 1915.

1,251,397.

Patented Dec. 25, 1917.

2 SHEETS—SHEET 1.

Fig. 1.



Attest:

E. O. Mitchell

Clarence Franck

by

Inventor:

James H. MacLauchlan

his Atty

J. H. MacLAUCHLAN.

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2 SHEETS—SHEET 2.

Fig. 2.

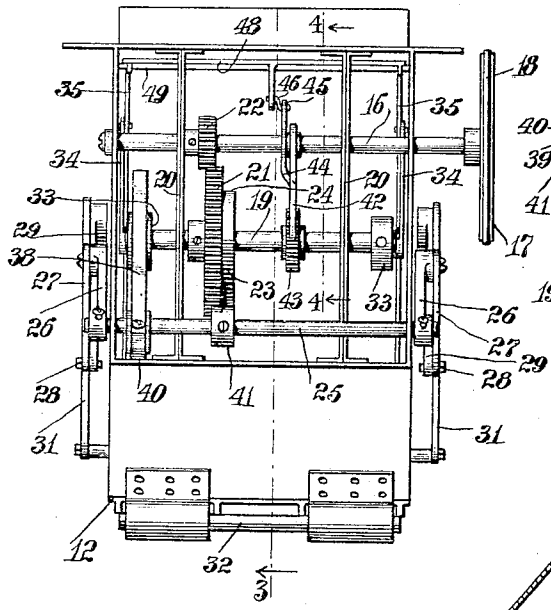


Fig. 3.

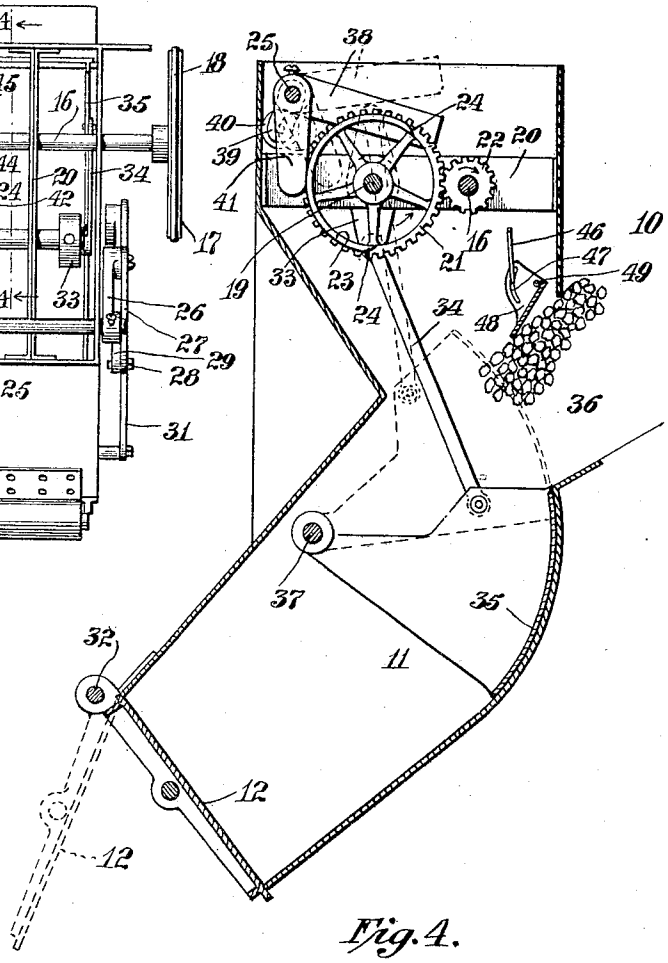
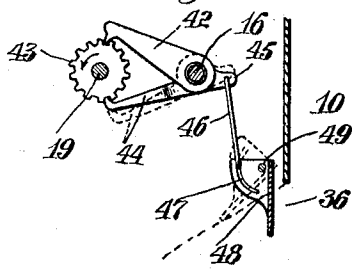


Fig. 4.



Attest:

E. Mitchell

Clara Francis

by

Inventor:

James H. Mac Lauchlan

his Atty

UNITED STATES PATENT OFFICE.

JAMES HENDERSON MacLAUCHLAN, OF NEW YORK, N. Y.

DELIVERY MECHANISM.

1,251,397. Specification of Letters Patent. **Patented Dec. 25, 1917.**

Application filed February 5, 1915. Serial No. 6,209.

To all whom it may concern:

Be it known that I, JAMES H. MacLAUCHLAN, a citizen of the United States of America, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Delivery Mechanism, of which the following is a specification.

My invention relates to a novel mechanism for delivering measured quantities of a commodity, and while it may be used generally for such purposes, it is particularly designed for use in connection with coal pockets to deliver predetermined quantities of coal to a car or engine or other vehicle.

One object of the invention is to provide a simply constructed apparatus by means of which pre-determined quantities of a commodity may be quickly and easily delivered to any desired receptacle. This object includes the construction of the apparatus with the fewest possible parts consistent with strength and efficient operation.

A further object is to provide means which will automatically cut off the main source of supply during the delivery period, so that but one complete charge will be delivered at any given time.

A further object consists in providing mechanism whereby unauthorized or improper operation of the apparatus is absolutely prevented.

A still further object is to provide a telltale device whereby the delivery mechanism remains locked if the supply source does not contain sufficient of the commodity being handled to provide at least one complete charge.

The invention may be embodied in a number of mechanical forms and to enable my invention to be clearly understood, I have shown a concrete embodiment thereof in the accompanying drawings, wherein—

Figure 1 is a side elevational view of the apparatus;

Fig. 2 is a top plan view thereof;

Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 2; and

Fig. 4 is a similar view on the line 4—4 of Fig. 2.

As above stated, the invention is particularly designed for use in connection with coal pockets and has been so shown in the present embodiment of the invention.

Referring to the drawings, the numeral 10 denotes a coal pocket containing the usual supply of coal which is to be delivered to cars or the like. Secured to the side of the coal pocket is a preferably downwardly curved casing 11 forming a delivery chute, the discharge end of which is controlled by a preferably pivotally mounted door 12. I may, if the needs of the occasion require it, provide an extension chute 13 pivotally connected to the lower end of the chute 11 and adapted to be raised out of, and lowered into, operative position by a rope or cable 14 connected to the outlet end of the extension chute 13 by means of a pivot-eye 15.

The apparatus may be manually or power operated, as desired, the structure remaining the same. Traversing the casing 11, near its upper end is the main shaft 16, carrying at one of its ends a pulley or gear wheel 17 over which passes a chain or belt 18, which is either run to a motor in case of power operation, or may hang loose if the device is to be manually operated.

Extending parallel to the main shaft 16, near the upper end of the casing 11, is a countershaft 19 revoluble in a suitable frame member 20 secured in the casing 11. The countershaft 19 carries a gear wheel 21 in mesh with a smaller gear or pinion 22 secured to the main shaft 16. In Fig. 2 of the drawing, the gear wheels 21, 22 are shown as relatively offset merely for clarity of illustration. In actual practice these gears may or may not be alined as desired.

Carried by the gear wheel 21 and preferably formed integrally therewith, is a cam surface or ring 23 which, as will be particularly noted in Fig. 3, is not co-extensive with the gear 21 and has its opposite ends 24 suitably beveled or curved. The purpose of this cam and of its construction as described will presently appear.

Extending parallel to the shafts 16 and 19, but preferably in a different plane is a third shaft 25 which bears in the side walls of the chute 11. This shaft 25 is connected to, and is adapted to, govern a system of links which control the opening and closing action of the door 12 at the discharge end of the chute 11.

Referring more particularly to Fig. 1, it will be noted that the shaft 25 has rigidly attached to each of its ends a short arm 26, the free end of which is pivotally connected to a link 27. The lower end of the link 27 is pivotally connected at 28 to a bell crank

lever 29, which is itself pivotally mounted on the fulcrum 30, the latter consisting of a pin or stud shaft projecting from the side of the casing 11. The longer arm of the bell crank lever is pivotally connected to a link 31 which has its opposite end pivotally connected to the gate 12, which is itself pivoted or hinged at 32 to the edge of the upper wall of the discharge opening in the chute 11. It will be understood that the system of links just described is duplicated, one system being arranged at each side of the chute 11.

Fixed to the countershaft 19, at opposite ends thereof, are similar cams 33 each of which is pivotally connected by means of a link 34 to an apron or valve 35 designed to cover and uncover the passage 36 which affords communication between the coal pocket 10 and the interior of the chute 11. The apron 35 is pivotally mounted at 37 within the chute 11. The chute, as will be particularly noted in Figs. 1 and 3, has a portion thereof adjacent the coal pocket curved in the arc of a circle, and the apron 35 is correspondingly curved so as to permit the apron to move smoothly in relation to the chute.

Secured to the shaft 25 in proximity to one of the cams 33 is a pendulatory lever comprising the arms 38 and 39 at an angle to each other, the arm 39 carrying a freely revoluble roller 40.

The construction is such that one of the cams 33 on the shaft 19 is adapted to engage the arm 38, and the roller 40 at predetermined times, as more fully hereinafter described.

Also carried by the shaft 25 is a pendent arm 41 in proximity to the cam surface 23 carried by the gear wheel 21. The relative position of the parts just described is clearly shown in Fig. 3 of the drawings.

I preferably provide the apparatus with a suitable tell-tale device, the purpose of which is to prevent operation of the delivery mechanism in case there is not sufficient coal in the pocket 10 to provide a complete charge at any given time. This tell-tale device may well take the form shown in detail in Fig. 4. Mounted on the main shaft 16 is a pawl 42 engaging the gear or pinion 43 carried by the countershafts 19, the position of this pawl 42 in relation to the gear wheel 43 is such as to cause the pawl to act as a back-lash pawl and prevent reverse rotation of shaft 19. Carried pivotally by the shaft 16 is a second pawl 44 which may engage the gear wheel 43 at a point practically diametrically opposite that at which the pawl 42 engages the gear. The pawl 44 has a rearwardly extending arm 45 into which is hinged a rod or link 46, the lower end of which is designed to ride in a curved slot 47 formed in a bracket 48 mounted on the pivot 49. This bracket extends entirely across or transversely of the chute 10 and is arranged near the upper end of the passage 36 through which coal passes from the pocket 10 to the chute. When the pocket 10 contains sufficient coal to deliver at least one complete charge to the chute, the bracket is canted by the pressure or weight of the coal as shown in Fig. 3 and the pawl 44 is in the dotted position of Fig. 4 thus permitting the gear 43 to turn in the direction of the arrow shown on that gear wheel in Fig. 4. When an insufficient supply of coal is present, the bracket 48 will depend practically in a vertical position (Fig. 4) exerting pull on the arm 45 to move the pawl 44 into engagement with the gear wheel 43 and prevent rotation of the latter. In this way the entire delivery device is locked against operation when an inadequate coal supply is present.

The upper end of the chute 11 is preferably provided with a hinged cover 50 which may be raised to give access to the interior of the apparatus.

The operation of the invention will be understood from the following description thereof:—It will be understood that the purpose of the device is to deliver a predetermined charge of coal, and that during the delivery period the main source, *i. e.* the coal pocket, will be closed by the apron 35 so as to prevent the passage of coal from the pocket to the delivery mechanism. In this manner absolute accuracy as to the quantity delivered during one charge is secured. When a charge is to be delivered, the wheel 17 is rotated in the direction of the arrow (Fig. 1), by suitable operation of the cord or chain 18. The cord is either caused to move manually or by means of a motor if the device is power operated.

When the device is inoperative to deliver a charge the position of the links is that shown in Fig. 1, and it will be noted that the bell crank lever 29 is in such position that the link 31 is at one side of and overlaps the fulcrum 30 of the bell crank lever 29. Owing to this position of the links, the weight of the coal, no matter how great it may be, acting against the gate 12 will not be sufficient to move the links and open the gate. The links can only be moved into a position to allow the gate to open, by operation of the shaft 25.

As the shaft 16 is rotated, the gear wheel 22 thereon will revolve the gear wheel 21 on the shaft 19 in the opposite direction causing the cams 33 to rise. As the left hand cam 33 (Fig. 2) strikes the arm 38, the shaft 25 will be given a quick rocking motion of sufficient extent to move the link 31 to the right (Fig. 1) a sufficient distance to permit the pressure of the coal against the gate 12 to quickly open this gate and allow

the coal to discharge. When the cam 33 has struck the arm 38 as above described, one end 24 of the cam 23 has just reached the depending arm 41 so that this arm may move inwardly between the two ends 24 of the cam. During continued rotation of shaft 19 the cam 33 engages the under face of arm 38 maintaining this arm in raised position. This action keeps the gate open, although, as a matter of fact, the coal issuing from the discharge end of chute 11 suffices for this purpose. The position occupied by the several parts, during the operation above described, is indicated in dotted lines in Fig. 3. When the cam 33 reaches the roller 40, it strikes the latter, forcing it outwardly, and acts on the system of links to move the door 12 into closed position. The striking of cam 33 against roller 40 is simultaneous with the return of arm 41 to a position on the outer face of cam 23 whereby the system of links is again locked against movement enabling the door 12 to open. The arm 41 mainly serves the purpose of preventing unauthorized or improper operation of the parts, inasmuch as when this arm rests against the outer face of the cam 23 the shaft 25 cannot be rocked to an extent sufficient to move the link 31 beyond the fulcrum 30 and to permit the door 12 to swing open.

The invention has been described in considerable detail, but it will be understood that modifications in construction and design, and correlation of parts may be readily effected by those skilled in the art, without departing from the spirit of the invention as defined by the scope of the accompanying claims.

What I claim as new and desire to secure by Letters Patent is:—

1. In delivery mechanism of the character specified, the combination of a commodity source, a discharge chute adapted to communicate therewith, a movable door controlling the outlet end of said discharge chute, a rock shaft, a connection from said rock shaft to said door, a second revolubly mounted shaft, means on said second shaft for rocking the first named shaft to operate said door, and means for normally retaining said first named shaft against rocking motion, said last named means comprising a cam on the revoluble shaft and a pendent arm on said rock shaft.

2. In delivery mechanism of the character specified, the combination of a commodity source, a discharge chute adapted to communicate therewith, a movable door controlling the outlet end of said discharge chute, a rock shaft, a connection from said rock shaft to said door, a second revolubly mounted shaft, operating means for said door including a lever on said rock shaft and a cam carried by said revoluble shaft and adapted to coact with said lever, and means for normally retaining said rock shaft against rocking motion comprising a second cam on the revoluble shaft and a pendent arm on the rock shaft adapted to engage said second cam.

3. In delivery mechanism of the character specified, the combination of a commodity source, a discharge chute adapted to communicate therewith, a door controlling the outlet end of said discharge chute, a rock shaft, links connected respectively to said rock shaft and to said door, a pivotally mounted bell-crank lever interconnecting said links, means for actuating said rock shaft to operate said bell crank lever to open and close said door, and means for normally retaining said rock shaft against rocking motion comprising a revoluble cam and a pendent arm on said rock shaft adapted to engage said cam.

4. In delivery mechanism of the character specified, the combination of a commodity source, a discharge chute adapted to communicate therewith, a door controlling the outlet end of said discharge chute, a rock shaft, a movable connection between said rock shaft and said door, a two armed lever on said rock shaft, and means adapted to first strike one arm of said lever to cause said door to open and to subsequently strike the second arm of said lever to cause said door to be closed.

5. In delivery mechanism of the character specified, the combination of a commodity source, a discharge chute adapted to communicate therewith, a door controlling the outlet end of said discharge chute, operating means for said door, and means interposed between said commodity source and said discharge chute for locking said operating means if said commodity source does not contain sufficient commodity for one complete charge.

6. In delivery mechanism of the character specified, the combination of a commodity source, a discharge chute adapted to communicate therewith, means for admitting measured quantities of commodity to said chute, a movable door controlling the outlet end of said discharge chute, operating means for said door to permit the discharge of a measured quantity of commodity from said chute, and means including a pivotally mounted member interposed between said commodity source and said discharge chute, to lock said operating means if said commodity source does not contain sufficient commodity for a complete charge.

7. In delivery mechanism of the character specified, the combination of a commodity source and discharging means therefor, a main driving shaft and a counter shaft, intermeshing gear wheels carried by

said shafts whereby said counter shaft is driven from said main shaft, a rock shaft, a movably supported door at the outlet end of said discharging means, a connection from said rock shaft to said door, cams on said counter shaft, and a pendulatory lever on said rock shaft having arms in the path of said cams.

8. In delivery mechanism of the character specified, the combination of a commodity source and discharging means therefor, a door movably mounted at the outlet end of said discharging means, a driven shaft, a rock shaft parallel to said driven shaft, a connection from said rock shaft to said door, means for rocking said rock shaft to actuate said connection and operate said door, and means for locking said rock shaft against effective motion, said last named means including an arm on the rock shaft and a coöperating cam ring on said driven shaft.

In testimony whereof I have affixed my signature in presence of two witnesses.

JAMES HENDERSON MACLAUCHLAN.

Witnesses:

CLARICE FRANCK,

OTTO MURRAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."