F. P. VOGT.

HOPPER AND DISCHARGE CHUTE.

APPLICATION FILED FEB. 28, 1921.

1,401,837.

Patented Dec. 27, 1921.

3 SHEETS—SHEET 1.

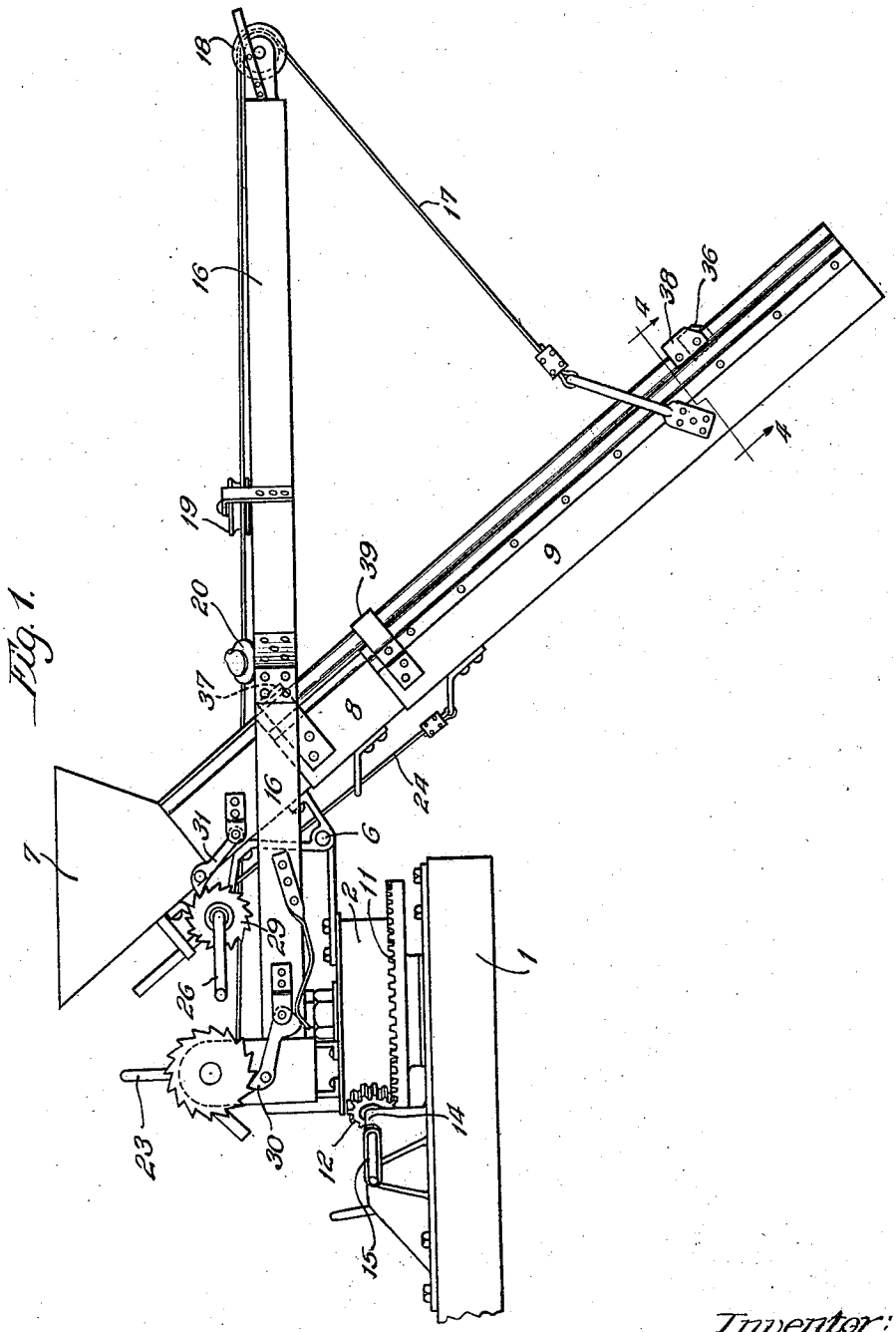


Fig. 1.

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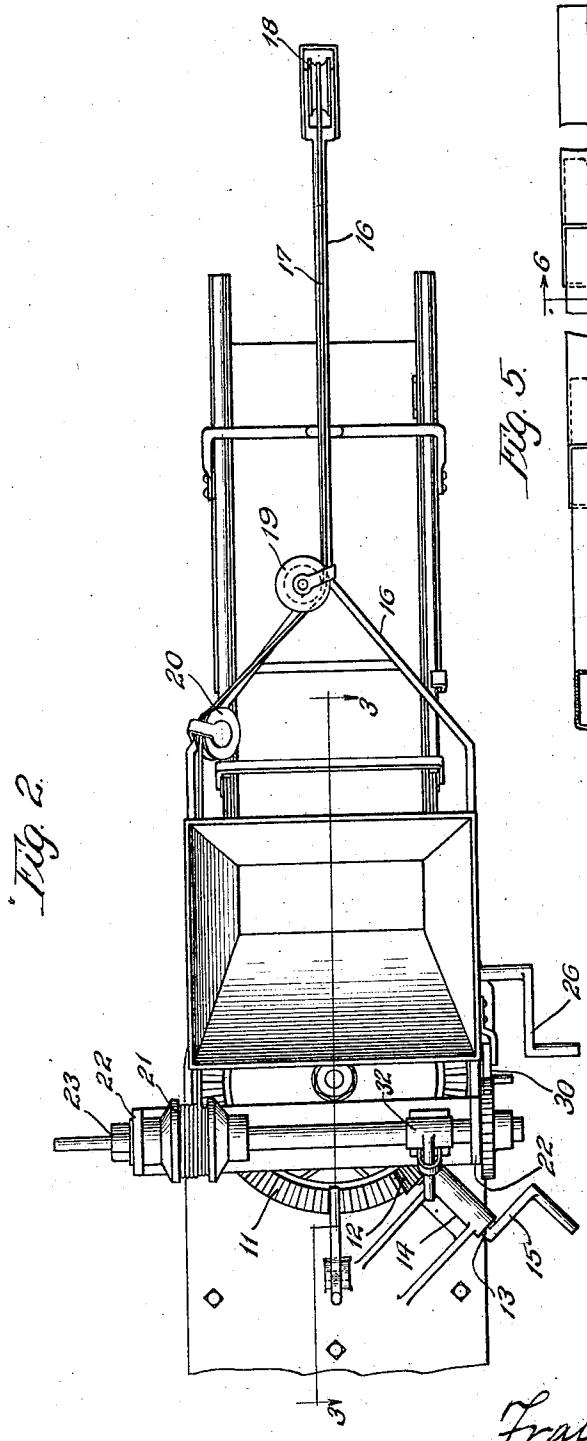


Fig. 2.

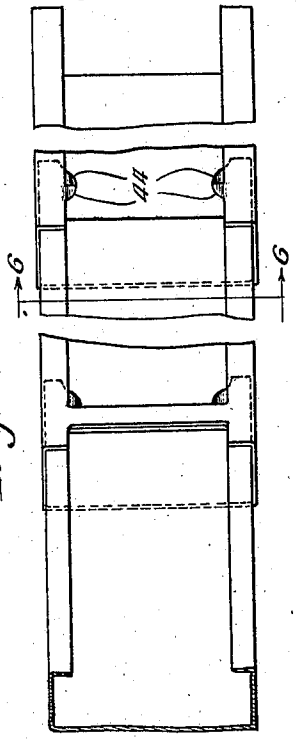


Fig. 5.

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3 SHEETS—SHEET 3.

Fig. 4.

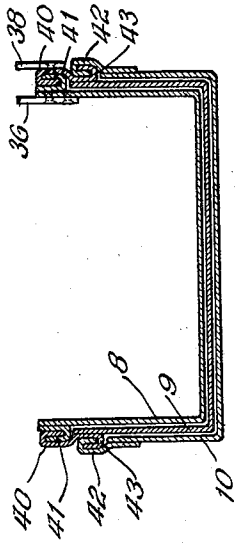


Fig. 6.

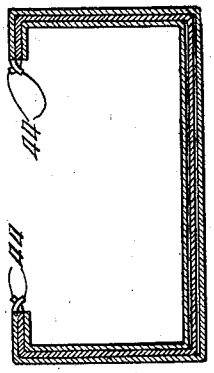
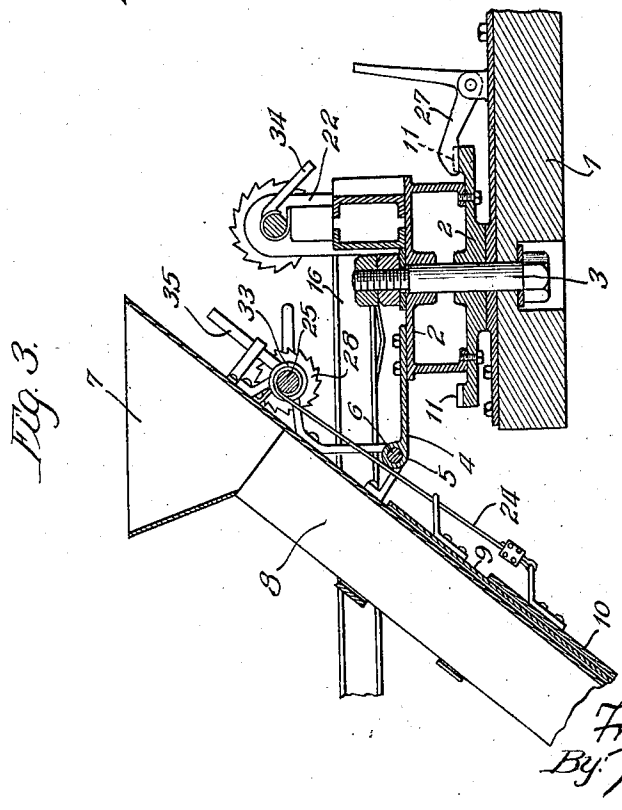


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK P. VOGT, OF CHICAGO, ILLINOIS.

HOPPER AND DISCHARGE CHUTE.

1,401,837. Specification of Letters Patent. Patented Dec. 27, 1921.

Application filed February 28, 1921. Serial No. 448,301.

To all whom it may concern:

Be it known that I, FRANK P. VOGT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hopper and Discharge Chutes, of which the following is a specification.

My invention relates to conveying devices and comprises a hopper and discharge chute construction for receiving concrete, grain or other fluid or semifluid mass from a relatively constant supply source and delivering same to varying discharge points.

The main object of my invention is to provide means for distributing material in various directions at various heights and at varying distances from the receiving hopper.

In accomplishing this object, I pivot my hopper and chute horizontally on a sole plate which, in turn, is pivoted vertically at a point adjacent the hopper, and a further object of my invention is to provide mechanism whereby an operator may easily rotate the sole plate upon its vertical pivot and the hopper and chute upon their horizontal pivot and I also provide mechanism which enables the operator to lengthen or shorten the chute at will.

Additional objects of my invention are to provide means for securing the hopper and chute in any desired position and to provide safety devices to prevent injury to workmen likely to be caused by too rapid operation of the mechanism.

A preferred embodiment of my invention is illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of the hopper, chute and operating mechanism, mounted upon a suitable base.

Fig. 2 is a plan of the device.

Fig. 3 is a vertical, longitudinal section taken on line 3—3 of Fig. 2.

Fig. 4 is a vertical transverse section through the chute taken on line 4—4 of Fig. 1.

Fig. 5 is a fragmentary top view of a modified form of chute, and

Fig. 6 is a transverse section therethrough taken on line 6—6 of Fig. 5.

The base 1 of my device is of any suitable construction, rigid enough to support the mechanism and the extended chute when the latter are filled with material and may be a substantial foundation, a scaffold, part of the frame work of a building being erected or of a vehicle, for example, the platform of a flat car.

A sole plate 2, preferably made in two portions, has vertically spaced bearings for a pivoting and holding down bolt 3, is mounted upon base 1 and is free to revolve thereon in a horizontal plane. Sole plate 2 mounts a bracket 4, having a horizontal bearing 5, in which is journaled a pin 6, carried in a frame on the underside of a hopper 7 and the first section 8 of the chute. This pivotal mounting adapts the hopper and chute to be rotated in a vertical plane.

Chute section 8 may be of any convenient length, an additional section 9 is preferably mounted on section 8 so as to slide longitudinally thereon and one or more additional chute sections, such as 10, may be added, if desired. Each additional section will be slidably mounted upon the preceding section, just as section 9 is mounted upon section 8. This mounting is illustrated in Figs. 1 and 4.

It is obvious that by extending or telescoping the chute sections, the material may be distributed to a point adjacent the hopper or to a point some distance therefrom. By rotating the hopper and chute upon the horizontal pivot 6, the discharge end of the chute is raised or lowered as desired. By revolving the chute, hopper and the sole plate 2 about the vertical pivot 3, the chute may be located in different radial positions about the base.

For revolving sole plate 2 and the hopper and chute mounted thereon, I provide the sole plate with a circular rack 11 and mount a driving pinion 12 therefor on a horizontal shaft 13 which is journaled in a suitable bracket 14 on base 1 and is provided with an operating crank 15.

For rotating the hopper and its chute upon the horizontal pivot 6, I mount an arm 16 on sole plate 2 and suspend the chute, at a point substantially spaced from the hopper, by means of a cable 17 which passes over sheave 18 mounted on the outer end of the arm 16. This cable is carried by sheaves 19 and 20 to a drum 21, the shaft of which is journaled in bearings 22 mounted on the sole plate and provided with a crank 23 by

means of which the shaft and drum may be rotated to take up cable 17 and raise the outer end of the chute.

A cable 24 is secured to the outer section of the chute and extends under the chute to a drum 25, mounted beneath the hopper and rotatable with its shaft by means of a crank 26. When cable 24 is wound up the chute sections are telescoped to the position shown in Fig. 1.

When the drums are released, the weight of the chute will unwind cable 17 and when the chute is sharply inclined the outer sections will slide to their extreme positions. If, because of hard usage or accumulation of dirt, the chute sections should not slide easily they may be assisted by the workmen.

To hold the hopper and chute in a given radial position, I provide a latch 27, mounted on base 1, adapted to engage the teeth of rack 11. The shafts of drums 21 and 25 are provided with ratchets 28 and 29 respectively and coöperating pawls 30 and 31. These pawls will be actuated by gravity or suitable springs to maintain their engagements with their individual ratchets and will be provided with handholds whereby they may be disengaged from their respective ratchets.

To prevent a destructive momentum of the descending or extending chute, I provide individual brakes 32 and 33 for the drum shafts. These are designed to be manually applied by means of their respective handles 34 and 35. I have described all of the above mechanism as adapted for manual operation, but that is optional and it will be understood that suitable power mechanism for operating the sole plate and the winding drums may be utilized if desired. When my hopper and chute are in use, it will not be necessary to operate the mechanism continuously, nor, generally, from one extreme to another at one time and it is believed that power means for securing the varying adjustments will seldom be required.

Chute section 8 is provided with a stop 36 adapted to engage a strap 37 secured to the inner end of section 9 and extending across the top of section 8. This stop and strap limit the outward movement of section 9. Section 9 is provided with a similar stop 38, and section 10 with a similar strap 39 which operate in the same manner to limit the outward movement of section 10.

Chute section 8 is provided with a U-shaped track 40 and chute section 9 is provided with a hanger 41 slidably mounted in track 40, and sections 9 and 10 are provided with similar track and hanger 42 and 43 respectively. In the modified chute shown in Figs. 5 and 6, the upper edge of each chute section is bent inwardly and forms at once a hanger for that chute and a track for the next chute, and these inwardly bent portions are provided with coöperating stop elements 44 which limit the outward movement of the chute sections as stops 36 and 38 and straps 37 and 39 limit the movement of their sections.

If my hopper and chute be used in connection with a concrete mixer, which discharges into hopper 7, they eliminate the long train of workmen with wheel barrows as well as the time consuming and otherwise expensive practice of adding and removing chute sections or platforms which must be built up and mounted on temporary supports. By using my invention, concrete may be applied to places which would otherwise be reached with considerable difficulty, if at all, such for example, as are frequently encountered in railroad construction work.

Some users having a limited class of work may find my device sufficient for their use with only a single chute section provided and it is to be noted that the horizontal and vertical adjustments of a single section may be obtained the same as similar adjustments of the extensible chute, but the telescoping chute is preferable equipment as by its use it is unnecessary to move the supply means every time the distance from the latter to the distributing point is varied.

I am aware that changes in the form and construction of parts and details of construction may be made without departing from the invention or sacrificing the advantages thereof and I reserve the right to make all such changes and modifications as fairly fall within the scope of the following claims.

I claim:

1. In a conveying device, a sole plate, a hopper mounted on said sole plate to swing about a horizontal axis, telescoping sections forming a chute leading from said hopper, an arm rigidly secured to said sole plate and extending outwardly above said chute, a cable secured to one of said sections spaced from said hopper and extending over the outer end of said arm to a point adjacent said hopper, a cable secured to one of said sections spaced from said hopper and extending to a point adjacent said hopper, and winding drums for said cables adjacent said hopper.

2. In a conveying device, a hopper, telescoping sections forming a chute leading from said hopper, an arm extending outwardly from said hopper, a cable secured to one of said sections spaced from said hopper and extending over the outer end of said arm to a point adjacent said hopper, a cable secured to one of said sections spaced from said hopper and extending to point adjacent said hopper, independent drums connected with said cables, means for operating said

drums, and locking ratchets and brake devices for said drums.

3. In a conveying device, a sole plate rotatable in a horizontal plane, mechanism for rotating said sole plate, a hopper mounted on said sole plate and rotatable in a vertical plane, telescoping sections forming a chute leading from said hopper and rotatable therewith, means for rotating said hopper and chute sections including an arm fixed to said sole plate to rotate therewith and flexible means connecting said chute and said arm, and means for telescoping said chute sections.

4. In a conveying device, a base, a sole plate, rotatable thereon in a horizontal plane, a circular rack fixed on said sole plate, a driving pinion journaled on said base and enmeshed with said rack, a hopper and an outwardly extending chute horizontally pivoted on said sole plate, an arm extending outwardly from said sole plate, and means on said arm for raising and lowering the outwardly extending portion of said chute.

5. In a conveying device, a base, a sole plate rotatable thereon in a horizontal plane, a circular rack fixed on said sole plate, a driving pinion journaled on said base and enmeshed with said rack, a hopper and an outwardly extending chute horizontally pivoted on said sole plate, said chute comprising telescoping sections secured to said hopper, an arm extending outwardly from said sole plate above said chute, means on said arm for raising and lowering the outwardly extending portion of said chute, and mechanism for telescoping the sections of said chute.

6. In a conveying device, a base, a sole plate rotatable thereon in horizontal plane, means for rotating said plate, a sole plate lock on said base, a hopper and chute vertically pivoted on said sole plate, means for rotating said hopper and chute on their pivot, and a lock for said means.

7. The combination of a base, a sole plate rotatable thereon about a vertical axis, a hopper pivoted to said sole plate to rotate about a horizontal axis, a chute comprising telescopic sections rigidly connected at one end with said hopper, an arm rigidly mounted on said sole plate and extending outwardly above said chute, flexible means connected with the free end of said chute and coöperating with said arm to adjustably support said chute and hopper in a desired position, means for telescoping said chute, and means for rotating said sole plate and superimposed mechanism.

8. The combination of a sole plate mounted to rotate about a vertical axis, a hopper, an extensible chute fixed to said hopper, means for mounting said hopper and chute on said sole plate to rotate about a horizontal axis, an arm extending above said chute and having spaced side portions secured to said sole plate and flexible, means connecting said chute and said arm, and adjustable to rotate said hopper and chute.

FRANK P. VOGT.