April 21, 1931. C. G. PFEIFFER 1,802,089

GRAVITY CONVEYER

Filed Dec. 4, 1926

FIG. I.

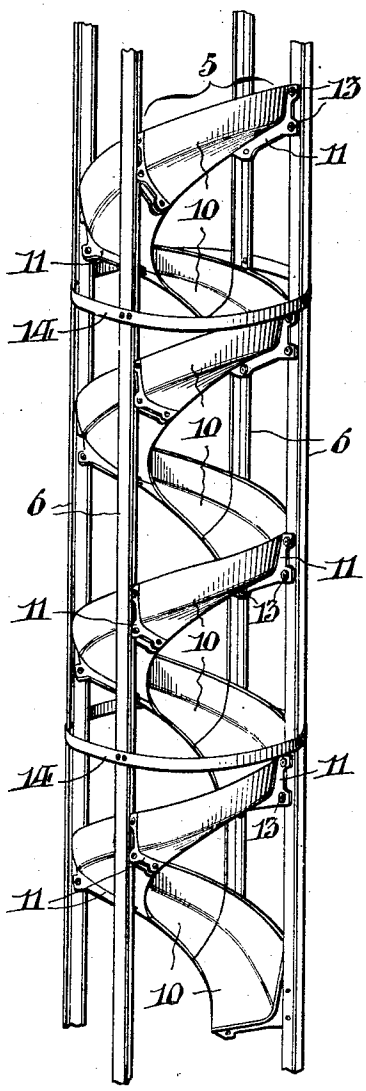


FIG. II.

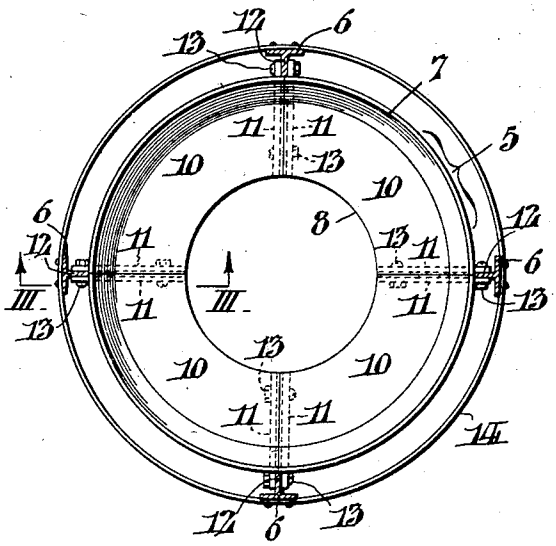
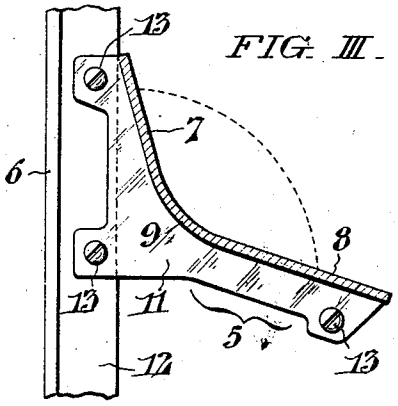


FIG. III.



WITNESSES

John C. Bergner

Frederick A. Kraus

INVENTOR:

Charles G. Pfeiffer,

BY Fraley & Paul

ATTORNEYS.

Patented Apr. 21, 1931 1,802,089

UNITED STATES PATENT OFFICE

CHARLES G. PFEIFFER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO SPECIALTY ENGINEERING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

GRAVITY CONVEYER

Application filed December 4, 1926. Serial No. 152,608.

This invention relates to gravity conveyers, and more particularly to conveyers of the spiral type as distinguished from the straight-away chute variety, for conducting granular materials, such as coal, gravel, sand, etc., at a non-accelerating rate from one elevation to another at a lower level.

Conveyers of the specific kind referred to are subject to extensive wear due to the effect of centrifugal action in increasing friction of the materials with the walls of the spiral raceway incidental to constant change in the direction of travel of the materials in such conveyers.

My invention is, in part, directed toward overcoming or counteracting the tendency mentioned to the end of facilitating movement of the materials in the conveyer, thereby to increase the longevity and usefulness of the latter and reduce the expense of its upkeep to the very minimum.

A further object of my invention is to secure the foregoing advantages in a conveyer organization embodying a spiral chute made up of a succession of volute sections capable of being easily and quickly secured together and to a supporting structure initially, and of being as easily individually detached from the supporting structure subsequently when replacement becomes necessary or desirable after extensive service.

Further objects and attendant advantages will be readily apparent from the detailed description.

In the drawings herewith, Fig. I shows a perspective view of a conveyer organization conveniently embodying my invention.

Fig. II is a transverse or horizontal sectional view of the same, drawn to a larger scale; and,

Fig. III a detail cross section on a further enlarged scale, taken as indicated by the arrows III—III in Fig. II.

As herein delineated, the conveyer organization includes a spiral conductor chute 5 that is sustained vertically by a supporting frame structure comprising a group of uprights 6, in this instance of T-shaped sections, symmetrically arranged with regard to the vertical axis of the organization and spaced equidistant from each other. From Fig. III it will be observed that the chute 5 is of obtuse angular cross section thus affording a raceway with a side wall 7 inclined outwardly somewhat to the vertical and meeting an inwardly and downwardly sloping bottom 8 in a well rounded curve at 9. The outwardly inclined side wall 7 and curve 9 cause the descending material to "creep" or move upwardly as a body relative to said walls, while the increased friction thereby set up slows down the progress of the material. Furthermore, the movement of the center of gravity outwards as the material descends, incident to the upward "creep" aforesaid, effects a change in the action of the centrifugal force due to the increase in the radius of rotation, which further aids in slowing up of the speed of the descending material. With this construction it will be apparent that the movement of the material along the raceway is greatly facilitated through easement of its gyratory downward progression, and wear resultant upon centrifugal action effectively reduced.

The chute 5 is made up of a number of identical quadrant volute sections 10, which, as best shown in Fig. II, meet flush, end to end, at the uprights 6, while the adjacent ends are provided with laterally projecting abutment flanges 11 adapted to engage opposite sides of the radial webs 12 of said uprights. This arrangement permits use of bolts or rivets 13 in securing contiguous sections 10 to each other and to the said uprights 6. The chute sections 10 may be constructed either as die stampings of sheet metal, or cast as may be desired or found most expedient in practice. In instances where the structure attains a considerable height, I preferably employ at suitable elevations, circular bands or straps 14 (Fig. I) to tie the uprights 6 rigidly together.

It is to be particularly remarked that the conveyer 5 of my invention is susceptible of easy and quick erection, and that, by virtue of being counterparts of one another, the volute chute sections 10 may be readily detached individually for purposes of repair or replacement without interfering with any

of the others or requiring dismantling of the structure as a whole. With uniformity as regards the pitch in the convolutions of the chute spiral 5, I have found that downward progression of material therein takes place without any noticeable acceleration or increase in speed with assurance against breakage of said material in transit. This is a very important consideration in conveyance of frangible materials such as coal for example. An outstanding characteristic of my invention is that the material is free to flow out of the chute 5 at any point in its height as the pile, on the ground or in a storage bin as the case may be, increases in elevation and size up and around it.

Having thus described my invention, I claim:

1. A spiral gravity conveyer chute comprising uniformly-pitched identical quadrant volute components of obtuse-angular cross-section with the side wall and bottom connecting by a well-rounded curve, said sections having lateral abutment flanges for securing them continuously together end to end.

2. A gravity conveyer organization including a supporting structure embodying a group of T-section uprights, and a spiral chute comprising uniformly-pitched identical quadrant volute components of obtuse-angular cross-section with the side wall and bottom connecting by a well-rounded curve, said sections having lateral abutment flanges for securing them one to another and to the upright aforsesaid.

3. A gravity conveyer organization including a supporting structure embodying a group of T-section uprights, and a spiral chute comprising uniformly-pitched identical quadrant volute components of obtuse-angular cross-section with the side wall and bottom connecting by a well-rounded curve, said sections meeting end to end at the uprights and having lateral abutment securing flanges to engage at opposite sides of the legs of said uprights.

4. A gravity conveyer organization including a supporting structure embodying a group of symmetrically-disposed T-section uprights spaced equidistant one from another with the leg portions directed radially inwards and rigidly united at different vertical levels by circumferential tie bands, and a spiral chute of obtuse-angled quadrant-volute components, with the side wall outwardly inclined and connecting with the bottom by a well-rounded curve, said chute being disposed within and secured to the radially directed legs of the T-section uprights aforesaid.

In testimony whereof, I have hereunto signed my name at Philadelphia, Pennsylvania, this 30th day of November, 1926.

CHARLES G. PFEIFFER.