Jan. 24, 1928. 1,656,920

L. O. McLEAN

RETARDING CONVEYER SYSTEM

Filed Jan. 31, 1925 2 Sheets-Sheet 1

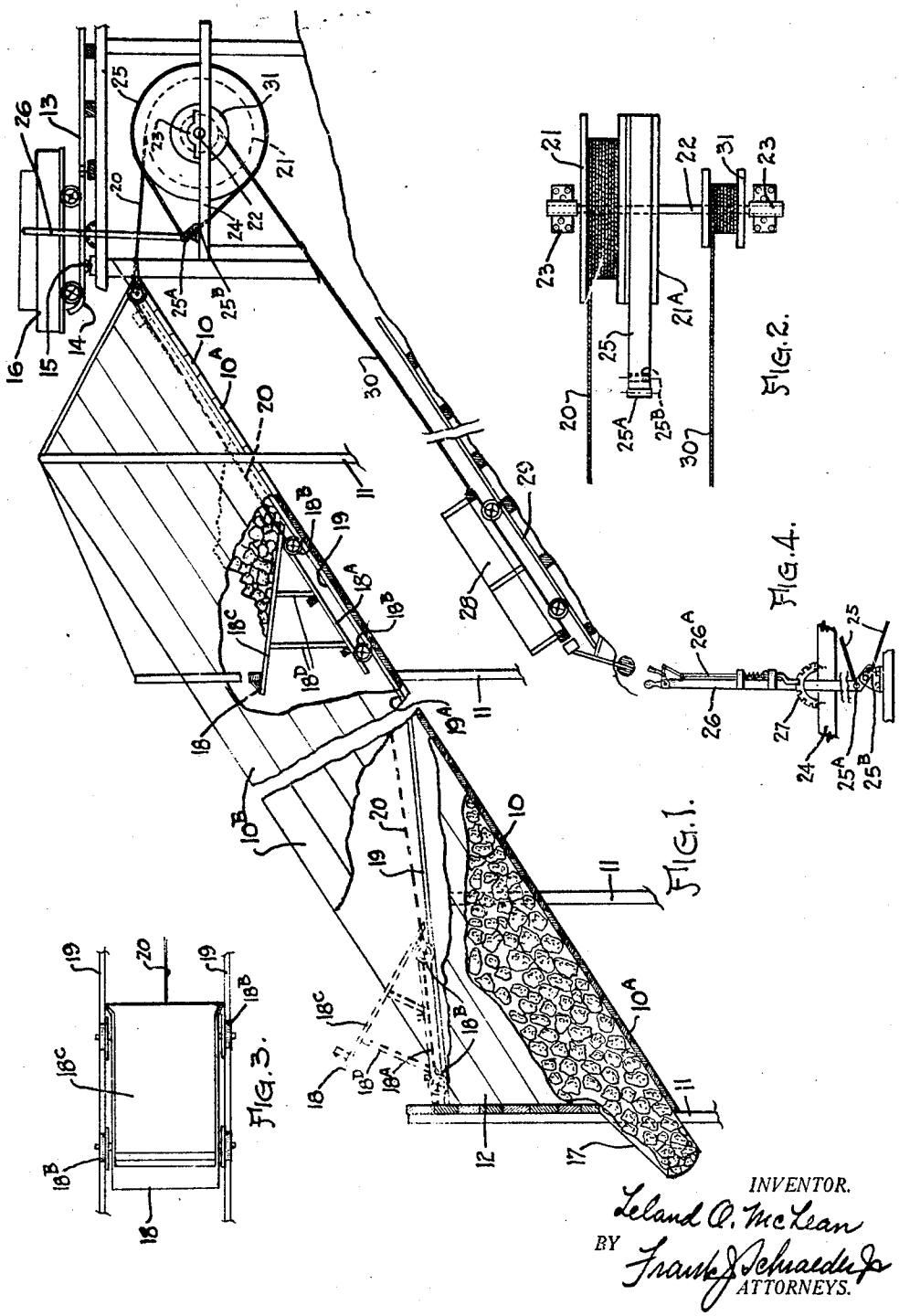


FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

INVENTOR.
Leland O. McLean
BY Frank J. Schroeder Jr
ATTORNEYS.

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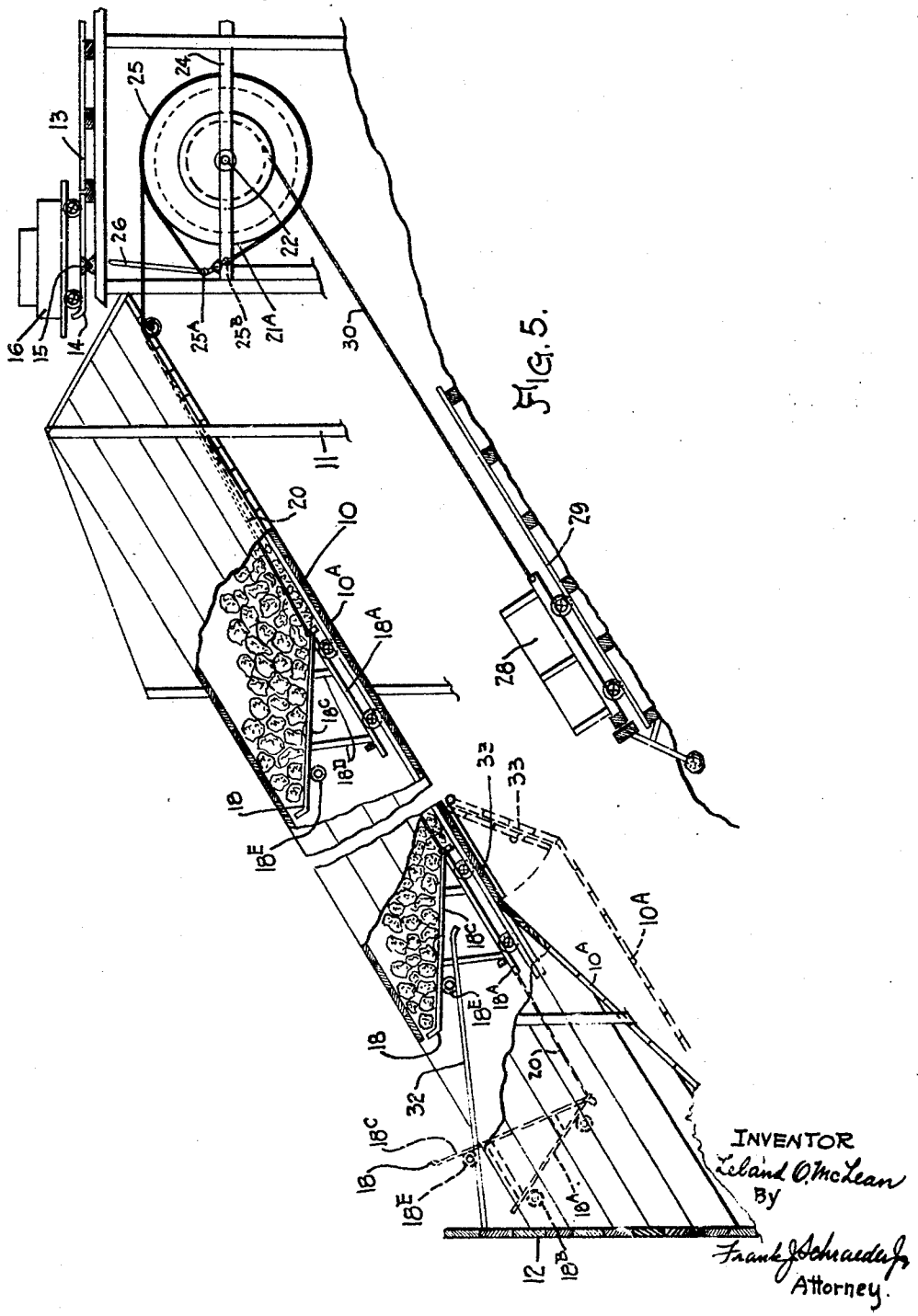


FIG. 5.

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UNITED STATES PATENT OFFICE.

LELAND OWENS McLEAN, OF PITTSBURGH, PENNSYLVANIA.

RETARDING CONVEYER SYSTEM.

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This invention relates to improvements in retarding conveyers such as used in mines, mills and the like for controlling the flow of materials as coal, ore and stone during the gravity flow of same in inclined chutes and the like.

One of the objects of this invention is to provide a novel retarding conveyer which shall be simple in construction, efficient in operation and which because of its low cost of manufacture and installation can readily be adapted to mines having a low capacity or output. Heretofore, retarding conveyers were made in several well known designs, among them being belt conveyers, steel apron conveyer, chain and flight conveyers, rope and disk conveyers, and balanced monitors or cars, but all these systems or equipments have been costly and complicated so that the original cost and installation together with the high maintenance cost became prohibitive for installation by low capacity mines and mills. While my improved retarding system is comparatively simple in design, construction and operation, there is no loss of any advantage or function inherent in the other systems enumerated, rather, the simplicity attained is a desirable obvious advantage.

It is also an object of my invention to provide a retarding system which requires no extraneous power such as steam or electric motor.

Another object of this invention is found in the movable, brake controlled, counterweighted retarder which is arranged to gradually lower the mass of material within the inclined chute from an elevation point to a lower point or storage bin.

A still further object of my invention resides in the relative arrangement of the drums for the retarder and counterweight cables which permits the use of a comparatively smaller drum for the counterweight cable, thus decreasing materially the length of the track for the preferable form of counterweight, here shown as a weighted car. It is obvious that where space permits, the weighted car could readily be substituted by a vertically movable counterweight of any suitable form.

With these and other objects in view, my invention consists in the novel arrangement, combination, and construction of the parts and members shown in the accompanying drawings, described in the following specifications and particularly pointed out in the appended claims.

Referring to the illustrations, which show one embodiment of my invention, Fig. 1 is a side elevation, with parts in section, showing my invention as applied to a mine car dump and employed for lowering the dumped material to a storage bin at the foot of the gravity chute.

Fig. 2, is a plan view of the retarder and counterweight drums showing the brake control:

Fig. 3, is a plan view of the retarder.

Fig. 4 is a side elevation of the brake control lever;

Fig. 5 shows a side elevation, in part section, of a modified form of retarder.

Referring to the illustrations, 10 indicates an inclined chute of wood, steel or any other suitable material, supported on the posts 11 and having in this instance a storage bin 12 at its lower end to receive the material which is gradually conveyed from the upper dumping point 13 which is provided with a dump 14 pivoted at 15 to permit the tilting of the mine car 16 into dumping or discharge position. The bin 12 may be provided with a gate controlled discharge chute 17 or with any other loading device suitable for controlling the discharge from the bin 12. In some cases, it will be readily apparent that the storage 12 may be omitted and that the material may be discharged directly from the inclined chute 10 into a railroad car or other vehicle without temporary storage as here provided.

The retarder 18 comprises a base 18^A mounted on the wheels 18^B which travel on the tracks 19. The tracks 19 extend parallelly with the floor 10^A of the chute 10 from the dumping point but are disposed angularly therefrom from the lower point 19^A over the storage bin for the purpose of permitting the retarder 18 to by-pass the material or to allow the coal or other material to escape under the retarder for discharge into the storage bin.

The material during its flow by gravity on the chute bottom 10^A is confined by the chute sides 10^B and is retained by the retaining wall 18^C which is supported by suitable frame work 18^D on the base 18^A.

The retarder cable 20 may be secured to the retarder 18 at the front wheel axle or to the base 18^A or any other point thereon where it will be permitted to trail close to

the chute bottom 10^A. The upper end of the cable 20 is secured to a preferably large drum 21 which is rigidly mounted on the shaft 22 carried by the bearings 23 on suitable supporting structural members 24.

The flange 21^A of the drum 21 is slightly widened for engagement by the steel brake band 25 the ends 25^A and 25^B of which are secured to the lower end of the operating lever 26. A notched segment 27 and spring-pressed release lever 26^A provide for retaining the operating brake lever 26 in loose or braking position whereby the retarder is positively controlled during its downward movement by the pressure of the material on the retaining wall 18^C.

For purposes of counterbalancing the retarder 18 and for returning same to the upper position I provide a traveling or movable counterweight, here shown in the form of a weighted car 28 mounted on tracks 29 and connected with a cable 30 to a small drum 31 also rigidly mounted on the shaft 22.

It is now apparent that with the retarder 18 in the upper position that the same will remain in such position upon receiving the mass of material dumped from the car 16 at the dumping position until the operating lever 26 is moved to release the brake band 25 which will release the retarder 18 to move downwardly while the counterweight 28 moves upwardly to its uppermost position which corresponds with the lowermost position of the retarder 18. The drum 31 is made smaller in diameter to afford a shorter travel for the counterweight 28 which effects a saving in the length of the tracks 29. After discharging its load the retarder 18 is returned to loading position by the descent of the counterweight 28 and such operation is also obviously controlled by the lever 26.

Referring now to the modification shown in Fig. 5, the retarder 18 in this instance is provided with a pair of wheels 18^E which are elevated above the wheels 18^B and supported from the retaining wall 18^C and are adapted to engage an elevated track 32 which is slightly inclined to lower the retarder as to gradually releases its load during its descent and pivotal turning action about the wheels 18^A.

My retarder can also be operated without the use of any elevated tracks 19 or 32 by simply making the wall 18^C steep enough to discharge the material thereon by gravity through a by-pass gate 33 which could be provided in the floor 10^A as shown by the dotted lines in Fig. 5.

I claim:

1. A retarding conveyer for lowering materials by gravity, comprising a support for the material to be lowered, means for controlling the movement of said support, means for bodily tilting said support during its downward movement to incline the material supporting floor thereof for discharging said material from said support, and means for returing said support to an elevated loading position.

2. A retarding conveyer for lowering materials in an inclined chute by gravity, comprising a support for the material to be lowered, means for controlling the movement of said support, means for bodily tilting said support during its downward movement to incline the material supporting floor thereof for releasing said material from said support for discharge below said support, and means for returning said support to the elevated loading position.

3. A retarding conveyer for lowering materials in an inclined chute by gravity, comprising a support for the material to be lowered, means for controlling the movement of said support at desired variable speeds, means for bodily tilting said support during its downward movement to incline the material supporting floor thereof for releasing said material from said support for discharge below said support, and means for returning said support to the elevated loading position.

4. A retarding conveyer for lowering materials in an inclined chute by gravity, comprising a support for the material to be lowered, means for controlling the movement of said support, means for releasing said material from said support including an elevated track for guiding said support from the normal path of said material to permit its discharge below the support, and means for returning said support to the elevated loading position.

5. A retarding conveyer for lowering materials in an inclined chute by gravity, comprising a support for the material to be lowered, means for controlling the movement of said support, means for releasing said material from said support including an elevated track portion adapted to receive and guide said support, pivotal means on said support adapted to engage said elevated track portion for pivotally carrying said support during its arcuate movement in gradually releasing the material, and means for returning said supports from said elevated track portion to the elevated loading position.

6. A retarding conveyer for lowering materials by gravity, comprising a support for the material to be lowered, frictional means for controlling the movement of said support, means for bodily tilting said support during its downward movement to incline the material supporting floor thereof for discharging said material from said support, and means for returning said support to an elevated loading position.

7. A retarding conveyer for lowering materials in an inclined chute by gravity, com-

prising a support for the material to be lowered, frictional means for controlling the movement of said support, means for bodily tilting said support during its downward movement to incline the material supporting floor thereof for releasing said material from said support for discharge below said support, a counterweight for returning said support to the elevated loading position, and differential mechanism connected with said support and said counterweight whereby said counterweight travels a comparatively shorter distance than said support.

In witness whereof I affix my signature.

LELAND OWENS McLEAN.