F. C. CARSTARPHEN.

TRIPPING DEVICE FOR CABLEWAY BUCKETS.

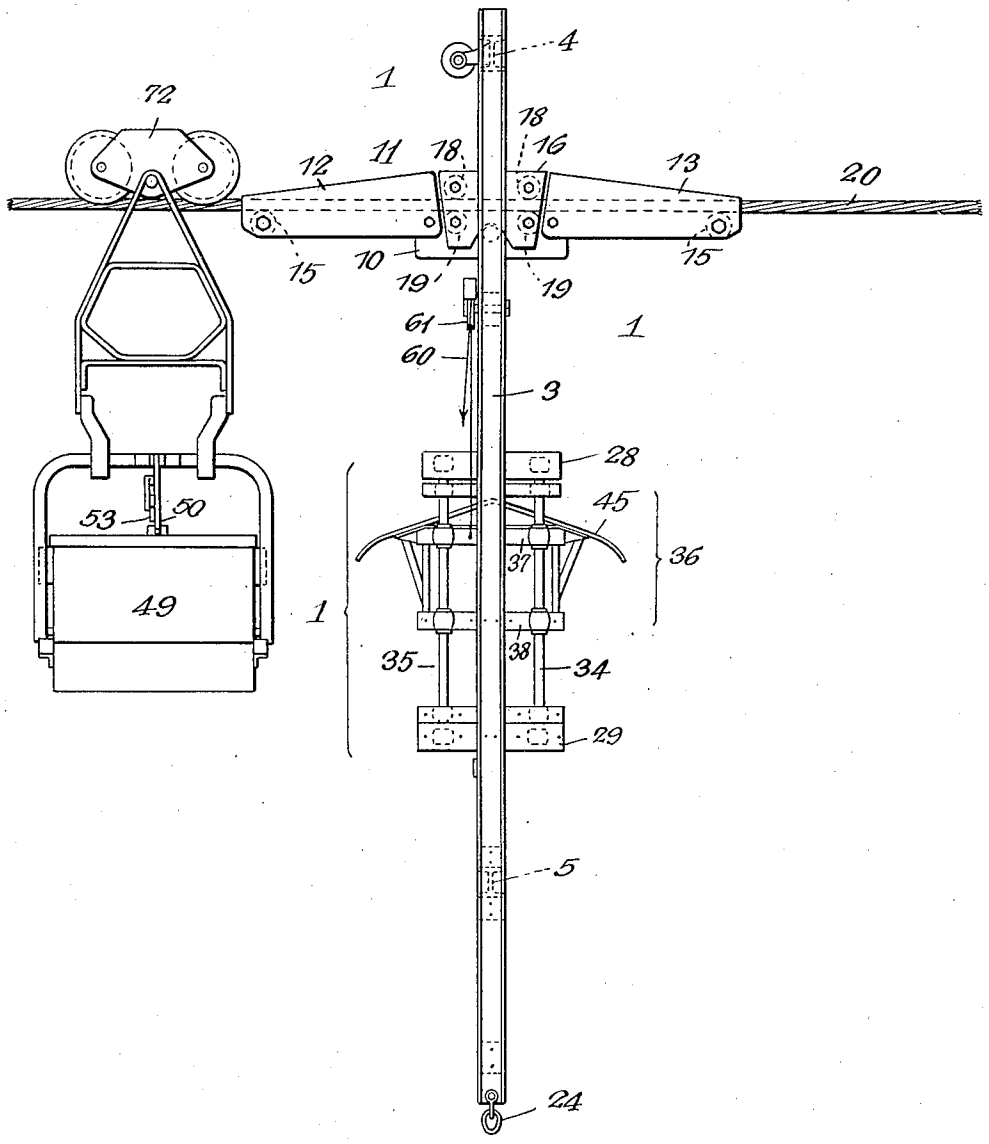
APPLICATION FILED OCT. 19, 1918.

1,331,622.

Patented Feb. 24, 1920.

5 SHEETS—SHEET 1.

Fig. 1.



INVENTOR
F. C. CARSTARPHEN.

BY
D. Anthony Usina
ATTORNEY

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5 SHEETS—SHEET 2.

Fig. 2

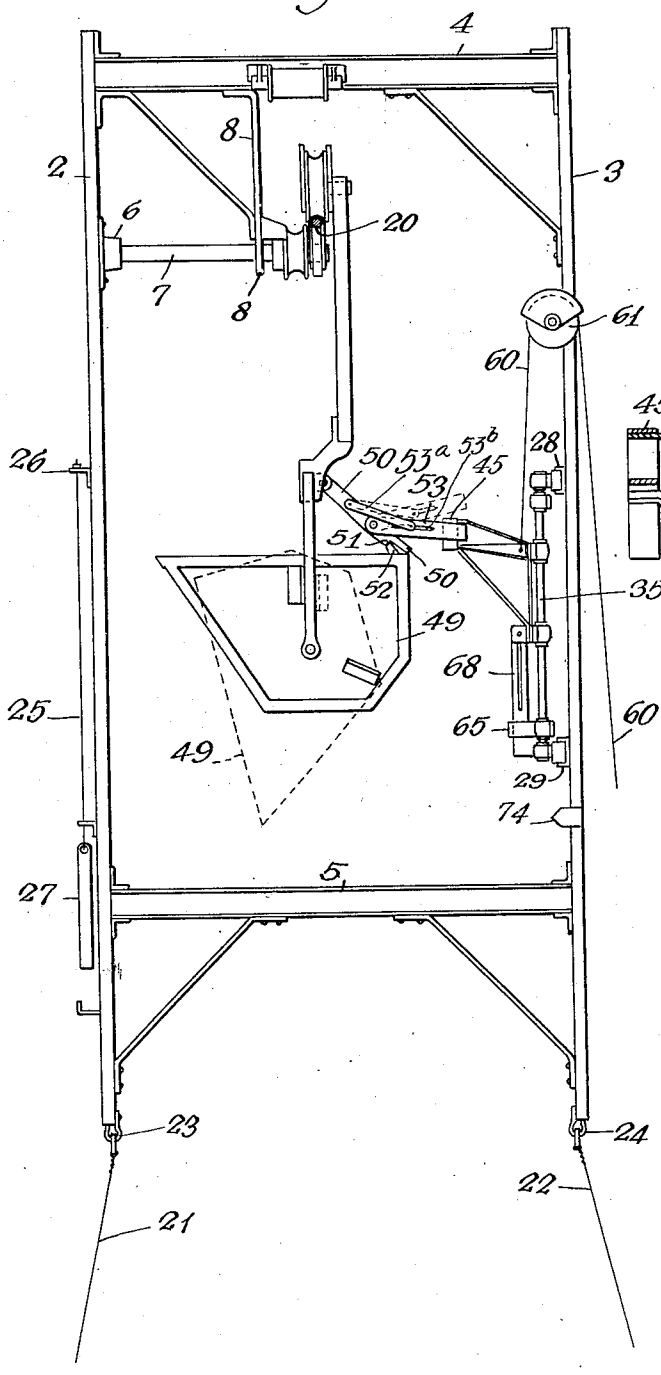
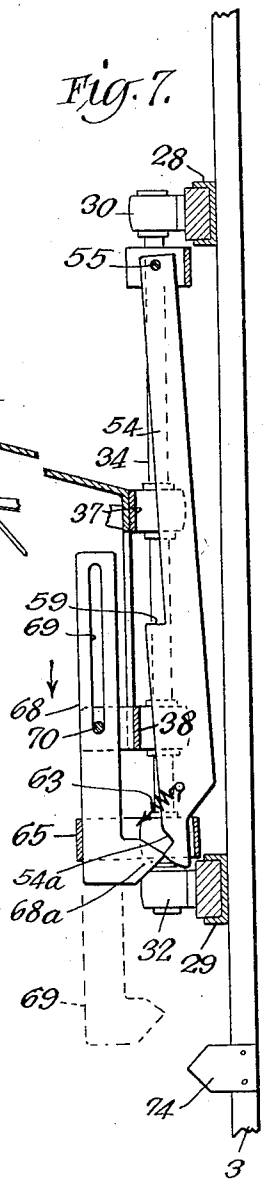


Fig. 7.



INVENTOR
F.C.CARSTARPHEN.
BY
D. Anthony Usina.
ATTORNEY

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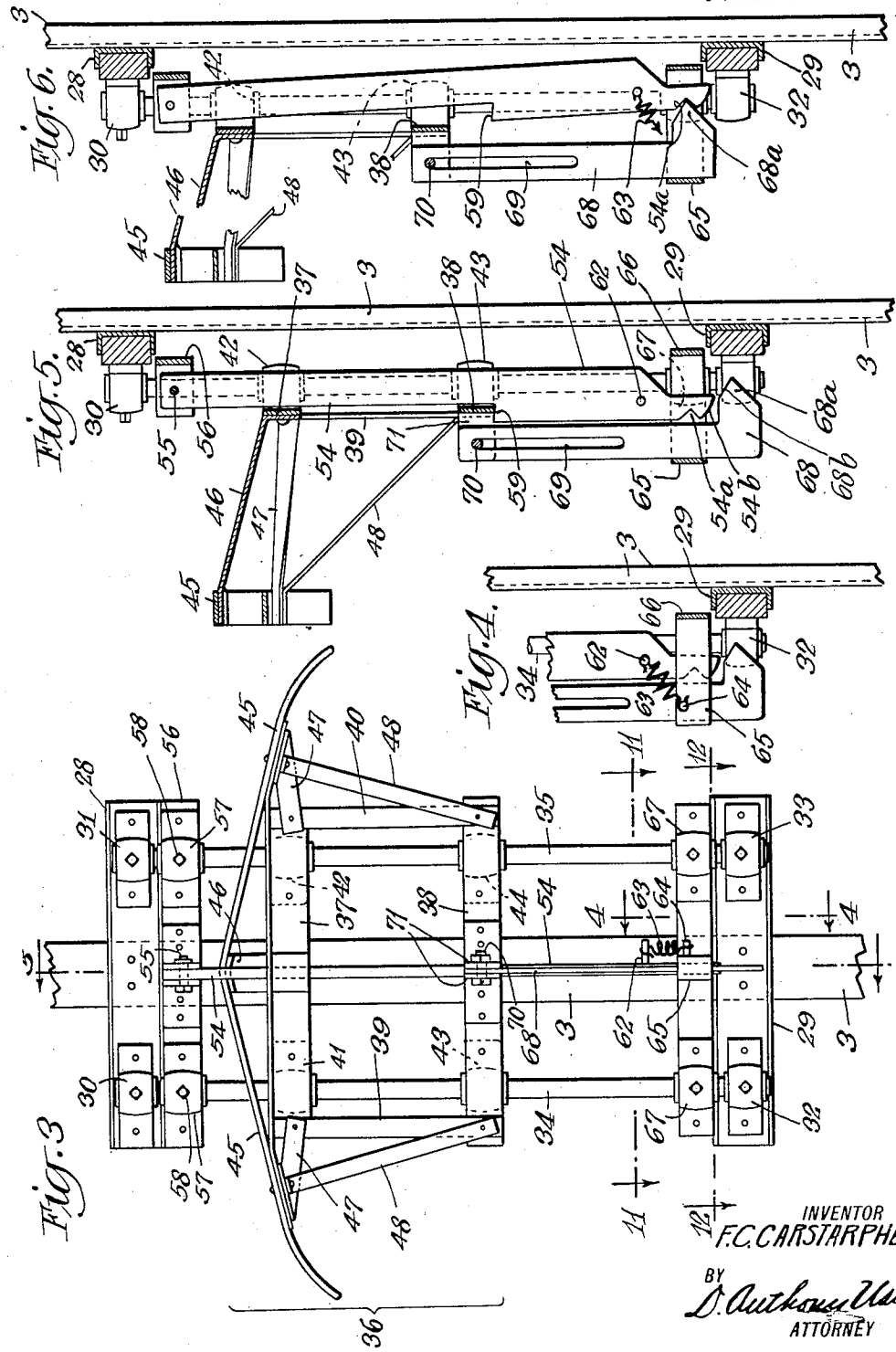


Fig. 6.

Fig. 5.

Fig. 4.

Fig. 3

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BY
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ATTORNEY

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5 SHEETS—SHEET 4.

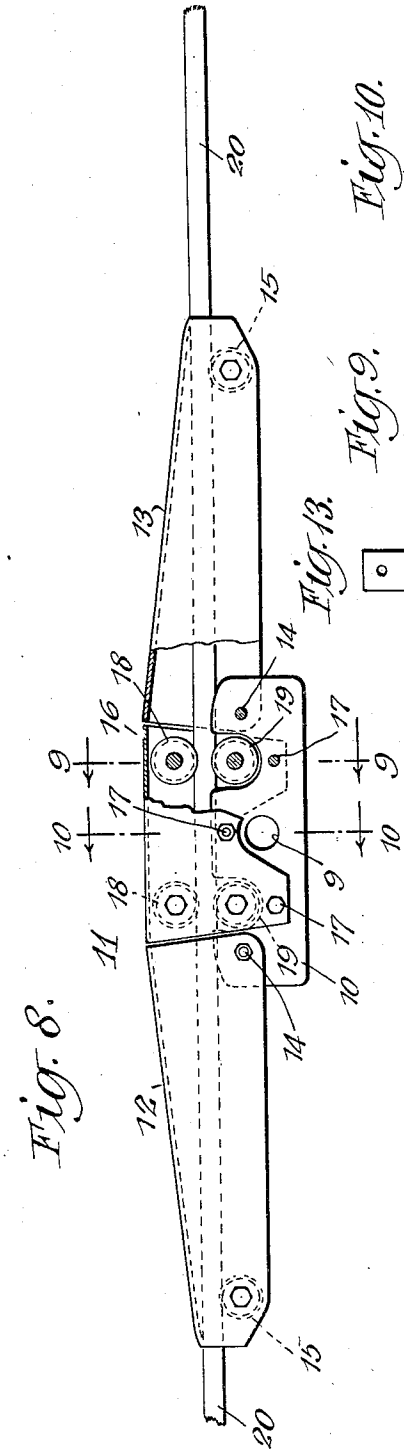


Fig. 8.

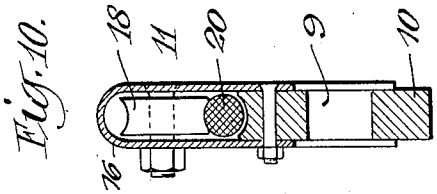


Fig. 10.

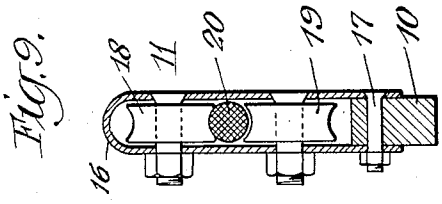


Fig. 9.

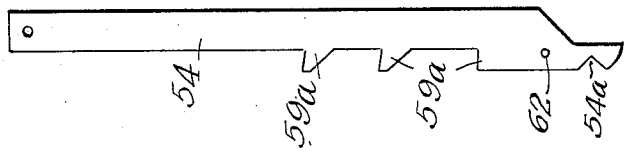


Fig. 13.

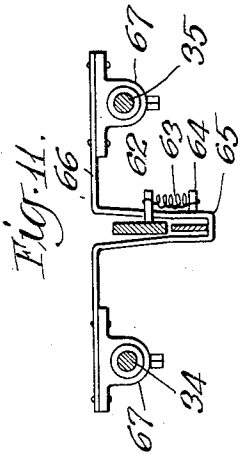


Fig. 11.

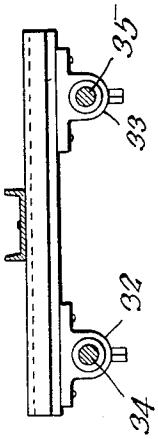


Fig. 12.

INVENTOR
F. C. CARSTARPHEN
BY
D. Anthony Usina
ATTORNEY

F. C. CARSTARPHEN.

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5 SHEETS—SHEET 5.

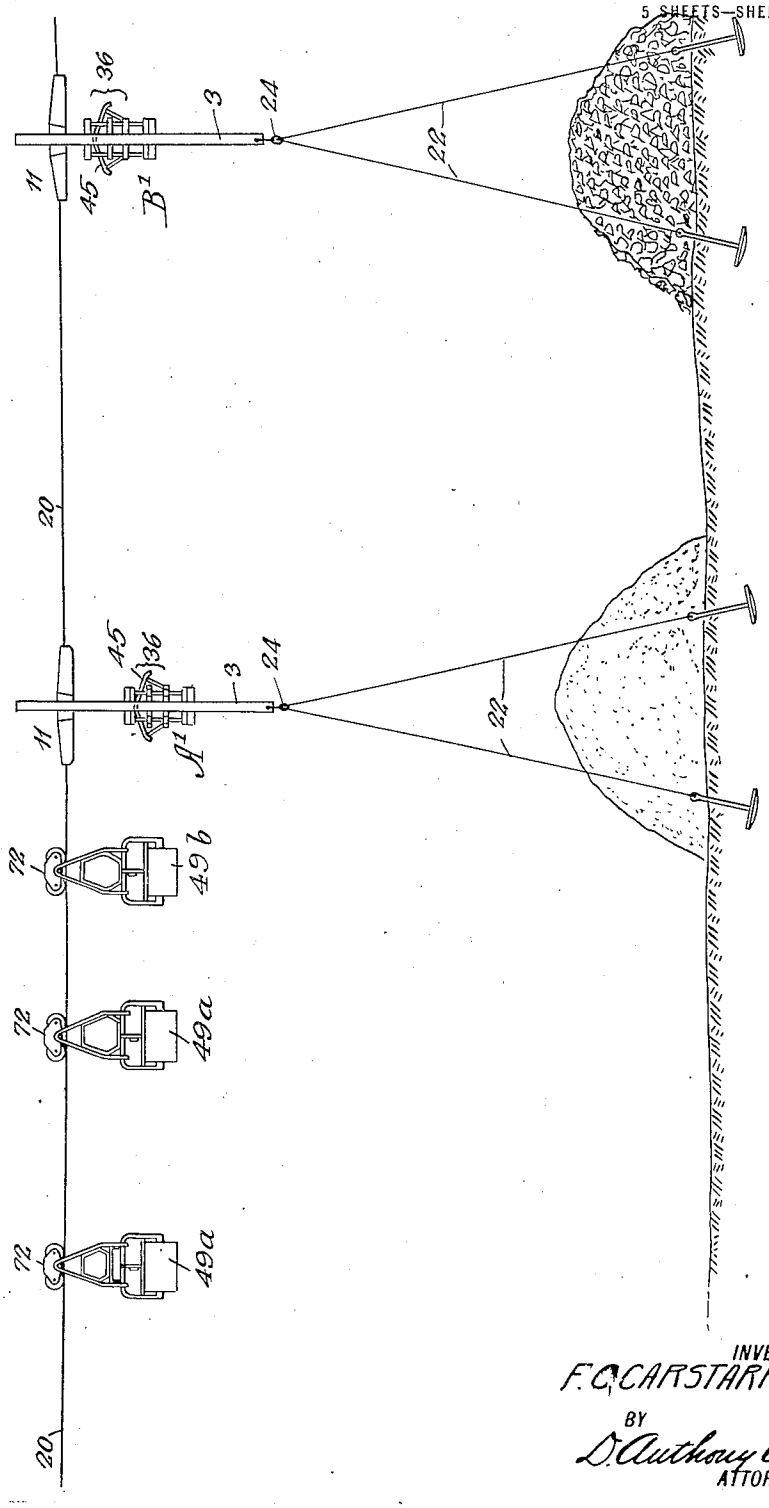


Fig. 14.

INVENTOR
F. C. CARSTARPHEN.
BY
D. Anthony Usina
ATTORNEY

UNITED STATES PATENT OFFICE.

FREDERICK C. CARSTARPHEN, OF TRENTON, NEW JERSEY, ASSIGNOR TO THE AMERICAN STEEL AND WIRE COMPANY OF NEW JERSEY, A CORPORATION OF NEW JERSEY.

TRIPPING DEVICE FOR CABLEWAY-BUCKETS.

1,331,622. Specification of Letters Patent. **Patented Feb. 24, 1920.**

Application filed October 19, 1918. Serial No. 258,814.

To all whom it may concern:

Be it known that I, FREDERICK C. CARSTARPHEN, a citizen of the United States, residing in Trenton, New Jersey, have invented certain new and useful Improvements in Tripping Devices for Cableway-Buckets, of which the following is a specification.

In aerial cableways, tramways and other load handling devices, dump buckets or other similar carriers are attached to carriages which run on a cable or rail and are usually moved by means of a traction rope which travels adjacent to the cable or track and is attached to the carriers by a suitable grip.

For handling material around mines, smelters and certain industrial plants, it is desirable to furnish an equipment adapted to selectively accumulate materials of different classes in different stock piles.

Heretofore fixed tripping devices arranged to engage the dump buckets have been fastened to the cable or rail and in order to change the location at which the stock piles would be accumulated it was necessary to have an operator travel out on the over-head cable or track to loosen and shift the tripping device which obviously was a slow and dangerous operation and not consistent with modern ideas of efficiency and safety.

My improved tripping device provides for the selective accumulation of different classes of material, and is so designed and constructed that it can be readily moved by an operator on the ground to different positions along the route of the cableway and is capable of adjustment from the ground so that the traveling buckets either may or may not be dumped at the will of the operator.

Other advantages and objects of the invention will be clear from the following specification and particularly pointed out in the appended claims.

Figure 1 is a side elevation of a portion of a cableway showing one of my improved tripping devices mounted thereon and a typical form of dump bucket adapted to cooperate with the tripping device.

Fig. 2 is an end elevation of the parts shown in Fig. 1 being viewed from the left, the track cable being shown in section.

Fig. 3 is an enlarged detail view of a portion of the tripping frame showing particularly the vertically adjustable tripping carriage.

Fig. 4 is a fragmentary detail section taken on the line 4—4 of Fig. 3.

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 3 showing the means for holding the carriage in its elevated or tripping position.

Fig. 6 is a similar view showing the carriage raised to the position it assumes prior to being reset to its inoperative position.

Fig. 7 shows an intermediate position of the carriage in which position it has just caused the releasing dog to disengage itself from the holding bar.

Fig. 8 is an enlarged detailed view of the movable supporting hood.

Fig. 9 and Fig. 10 are cross-sections on the lines 9—9 and 10—10 of Fig. 8 showing details of construction of the supporting hood.

Fig. 11 is a horizontal section on the line 11—11 of Fig. 3.

Fig. 12 is a similar section on the line 12—12 of Fig. 3.

Fig. 13 is a detail view of a modified form of holding bar.

Fig. 14 is a diagrammatic side elevation showing a plurality of tripping frames and automatic dump buckets arranged to coact therewith.

Referring particularly to Figs. 1 to 3, the tripping frame referred to generally by the numeral 1 comprises upright channel beams 2 and 3 joined at the top and bottom by transverse I beams 4 and 5 which are secured thereto in any suitable manner. A bearing 6 secured to the upright 2 supports one end of a supporting bar 7. Near its other end, this bar passes through a suitable aperture in a strap 8 which is secured to the cross-bar 4 of the tripping frame. The inner end of the bar 7 projects into an aperture 9, Fig. 8, formed in a block 10 which is secured to the supporting hood 11. This supporting hood is constructed of two inclined sheet metal jackets 12 and 13 secured by bolts 14—14 to the supporting block 10, and a central jacket 16. Near their outer ends grooved rollers 15—15 are journaled be-

tween the cheeks of the inclined jackets. The central jacket 16 is similarly secured by means of bolts 17 to the supporting block 10 and between its cheeks are mounted the upper and lower groove rollers 18—18 and 19—19. This hood affords a good support for the entire tripping mechanism and the several grooved rollers referred to permit of its being easily moved along the track cable 20.

Rollers are provided on both the upper and lower sides of the cable to prevent the hood from jumping off as the cable rebounds after one of the dumping buckets has discharged its contents.

The supporting hood as thus constructed affords a supporting means for the tripping frame to be hereinafter described which is capable of being pulled along to different locations along the route of the cableway thereby making it possible to trip the dump buckets at corresponding locations as hereinafter more fully described.

When the tripping frame has been positioned at the desired location on the cableway it is readily secured in place by means of guy lines 21 and 22 which are attached to the shackles 23 and 24 of the tripping frame. These guy lines are also utilized to pull the tripping frame and its supporting hood along the cableway. A plumb line 25 assists in enabling the operator to position the frame in a substantial true vertical position. This line is suspended from a short angle bracket 26 secured to the upright 2 and a sash weight 27 serves the purpose of a plumb bob.

Secured to the upright 3 of the frame are upper and lower channel bars 28 and 29 which serve to support the upper bearings 30 and 31 and the lower bearings 32 and 33 respectively. Upright guide rods 34 and 35 are secured in place in the above mentioned bearings and serve as guides for the tripping carriage indicated generally by the numeral 36. The tripping carriage is slidably mounted for vertical movement on the rods 34 and 35 as shown in Fig. 3. This carriage comprises essentially an upper cross-bar 37, a lower cross-bar 38 and connecting side bars 39 and 40. Upper bearings 41 and 42 are secured to the top cross-bar 37 and similar bearings 43 and 44 are secured to the lower cross-bar 38. The bearings 41, 42, 43 and 44 are slidable on the upright rods 34 and 35 and serve to guide the tripping carriage in its movements. At its upper end the tripping carriage supports a double inclined tripping cam 45 which is secured to the carriage by means of a central outwardly extending bracket 46, side brackets 47 and braces 48. The cam 45 is arranged to engage an automatic latch of known construction carried by a typical form of dump bucket 49 such as shown in Fig. 2. The latch on this bucket comprises a bar 50 having a shoulder 51 which normally engages a lug 52 secured to the bucket. An outwardly extending vertically swinging arm 53 is pivotally secured by one end to the bar 50 and arranged to coact with the cam 45. The swinging end of the bar 53 is held in its vertically adjusted position by means of the diagonal bar 53^a which is pivotally secured at one end to the latch bar 50 and is fastened at its other end to the bar 53, by means of a bolt which extends through the slot 53^b in the bar 53. It is clear that if the carriage is in its elevated position and the bucket is moved longitudinally the bar 53 will ride up the inclined surface of the cam 45 and the latch on the bucket will be tripped thereby permitting the unbalanced load to swing the bucket to the dotted position shown in Fig. 2, thus discharging its contents.

For holding the tripping carriage 36 in its raised or latch-engaging position, I employ a bar 54 which is pivoted at 55 to a cross-bar 56 which cross-bar is supported on bearings 57 secured to the guide rods 34 and 35. The bearings 57 are each provided with set screws 58 so that the position of the bar 54 may be adjusted vertically when necessary or desirable to compensate for different locations of latches on the dump buckets. The bar 54 is provided with a shoulder 59 which is arranged to engage the lower edge of the cross-bar 38 when the tripping carriage is set in position to dump the buckets, this position being illustrated in Figs. 2, 3 and 5.

The carriage 36 is operable from the ground by means of a light cable 60, Fig. 2, which passes over a suitable sheave 61 secured to the frame 3. The pivoted bar 54, Fig. 4, has a pin 62 thereon which carries a spring to keep this bar normally in position to hold the carriage in its elevated position as shown in Fig. 1. The other end of this spring is anchored to a pin 64 which is secured to an extension 65 of a bent cross-bar 66. Cross-bar 66 is supported on bearings 67—67 which are adjustably secured by suitable set screws to the upright rods 34 and 35. The cross-bar 66 serves principally as a guide for the swinging bar 54 and as a back-stop, and guide for the releasing dog 68. The dog 68 is slotted at 69 and normally held in the position shown in Fig. 5 by a short bolt 70 carried by brackets 71 which are riveted or otherwise secured to the cross-bar 38.

Normally it is desired to tip the traveling buckets at predetermined locations along the cableway, and at such times the tripping carriage is held in the elevated position illustrated in Figs. 1, 2, 3 and 5 so that the carriers 72 of all the buckets passing through the tripping frame will travel up the inclines of the supporting hoods 11 and the bars 53 carried by the bucket latches will be caused

to ride up the cam 45 of the tripping carriage, which will act to release the latch and cause the bucket to discharge its contents.

When it is desired to change the location at which the buckets will be dumped I may either pull the entire tripping frame by means of the guy lines along the cableway to the location at which it is desired to accumulate another stock pile and anchor said tripping frame in place at such a location or I may employ a second tripping frame of identical structure with that described and render the first tripping frame inoperative so far as releasing the buckets is concerned. This is readily accomplished by causing the tripping carriage 36 to be lowered to such a position that its cam 45 will not engage the bucket latches as the carriers travel along the cableway.

When it is desired to so lower the tripping carriage it is simply necessary for the operator to first raise the carriage by pulling the cable 60 to such a position that the nose 68^a of the releasing dog 68 will enter the notch 54^a in the bar 54 as shown in Fig. 6, it being clear that during the upward movement of the carriage the inclined surface 68^b will strike the cam surface 54^b near the free end of the locking bar 54. With the parts in this position, the shoulder 59 on the bar 54 will be thrown back a sufficient distance to permit the cross-bar 38 of the carriage to move downwardly without being engaged thereby. During the downward travel of the carriage the tension of the spring 63 will prevent the downward movement of the releasing dog 68, it being understood that the bolt and slot connections 69 and 70 will permit the carriage to move downwardly without positively driving the releasing dog with it. As the tripping carriage nears its limit of downward travel, the bolt 70 will reach the lower end of the slot 69 and the blow delivered will be of sufficient force to overcome the tension of the spring 63, thereby causing the nose 68^a of the dog to rock the locking bar back to the position shown in Fig. 7, and the subsequent movement will permit the releasing dog to drop by gravity to the dotted position shown. The carriage may then proceed downwardly to its final position in which the bearings 43 and 44 come into contact with the bearings 67—67. In this position, the nose of the releasing dog 68 will approximately register with a marker 74 fixed to one of the uprights 3 of the frame. This marker serves to indicate to workmen or other operators on the ground that the tripping carriage is in its inoperative position.

From the foregoing it will be clear that to bring the carriage 36 to its tripping position, it is merely necessary to pull on the cable 60 to raise the carriage, until the bar 54 snaps into place under the cross-bar 38 of the carriage, thus positioning the shoulder 59 so that it will support the carriage.

While I have illustrated only one shoulder in the holding bar 59 it is clear that a plurality of notches or teeth 59^a could be provided as shown in Fig. 13, which would permit of positioning the tripping cam 45 in a number of different elevated positions.

Such an arrangement would make it possible to selectively trip buckets whose latches were positioned to coöperate with respective tripping frames located along the cableway at predetermined positions, or another arrangement would be one wherein the shoulder 59 on the various tripping bars would be located at different elevations on the several tripping frames along the cableway.

Fig. 14 illustrates diagrammatically an arrangement wherein the holding bars 54 position the tripping carriages at different elevated tripping positions. As therein shown the buckets 49^a—49^a are arranged to be tripped by the frame A′. The latch 53 on the bucket 49^b will be adjusted vertically to such a height that it will pass through the frame A′ without being affected by its cam 45, but when it reaches the frame B′ it will be tripped thereby if the cam is in the elevated position shown.

From the foregoing it is clear that with a cableway equipped with either one or several tripping frames as above described it is a comparatively simple matter to selectively distribute different classes of material along the route thereof.

The advantage of being able to control the dumping of the buckets from the ground and also the ability to shift the location of the tripping frames by merely pulling them along by the guy lines will be readily grasped by those skilled in the art.

While I have described with great particularity the details of construction of the particular embodiment of the invention shown, it is not to be construed that I am limited thereto as many structural changes may be made without departing from the spirit and scope thereof as defined in the appended claims.

What I claim is:—

1. The combination with a cableway, of an automatic dump bucket having a retaining latch arranged to normally prevent the bucket from discharging its contents, and means for operating said latch at selective points along said cableway, said operating means comprising a frame suspended from and movable along said cableway, a tripping carriage mounted for vertical movement on said frame, and means for moving said carriage into and out of operative position.

2. The combination with a cableway, of an

automatic dump bucket having a retaining latch arranged to normally prevent the bucket from discharging its contents, and means for operating said latch at selective points along said cableway, said means comprising a frame suspended from and movable along said cableway, a tripping carriage mounted for vertical movement on said frame, a tripping cam on said carriage, and means for moving said carriage vertically into and out of operative position.

3. The combination with a cableway, of an automatic dump bucket having a retaining latch arranged to normally prevent the bucket from discharging its contents, and means for operating said latch at selective points along said cableway, said means comprising a frame suspended from and movable along said cableway, a tripping carriage mounted for vertical movement on said frame, a tripping cam rigidly secured to said carriage and adapted to operate said bucket retaining latch, and means operable from the ground for moving said carriage vertically into and out of operative position.

4. The combination with a cableway, of an automatic dump bucket having a retaining latch arranged to normally prevent the bucket from discharging its contents, and means for operating said latch at selective points along said cableway, said means comprising a frame suspended from and movable along said cableway, a tripping carriage mounted for vertical movement on said frame, a tripping cam rigidly secured to said carriage and adapted to operate said bucket retaining latch, a spring accelerated latch for locking said carriage in operative position, and means operable from the ground for releasing said latch.

5. The combination with a cableway, of an automatic dump bucket having a retaining latch arranged to normally prevent the bucket from discharging its contents, and means for operating said latch at selective points along said cableway, said means comprising a frame suspended from and movable along said cableway, guide rods on said frame, a tripping carriage mounted for vertical movement on said guide rods, a tripping cam rigidly secured to said carriage and adapted to operate said bucket retaining latch, and means operable from the ground for moving said carriage vertically into and out of operative position.

6. The combination with a cableway, of an automatic dump bucket having a retaining latch arranged to normally prevent the bucket from discharging its contents, and means for operating said latch at selective points along said cableway, said means comprising a frame suspended from and movable along said cableway, guide rods on said frame, a tripping carriage mounted for sliding vertical movement on said rods, a tripping cam rigidly mounted on said carriage, means for moving said tripping carriage vertically into and out of operative position, and means for locking said carriage in its operative position.

7. The combination with a cableway, of an automatic dump bucket having a retaining latch arranged to normally prevent the bucket from discharging its contents, and means for operating said latch at selective points along said cableway, said means comprising a hood having rollers journaled therein adapted to travel on said cableway, a frame suspended from said hood, guide rods on said frame, a tripping carriage mounted for sliding vertical adjustment on said rods, a tripping cam on said carriage, means for sliding said tripping carriage vertically into and out of operative position on said frame, and means for locking said carriage in its operative position.

8. The combination with a cableway, of an automatic dump bucket having a retaining latch arranged to normally prevent the bucket from discharging its contents, and means for operating said latch at selective points along said cableway, said means comprising a hood having rollers journaled therein adapted to travel on said cableway, said hood having its upper face inclined longitudinally from a transverse medial line, a frame suspended from said hood, guide rods on said frame, a tripping carriage mounted for sliding vertical movement on said rods, a tripping cam rigidly mounted on said carriage, means for sliding said tripping carriage vertically into and out of operative position, and means for locking said carriage in its operative position.

9. The combination with a cableway, of an automatic dump bucket having a retaining latch arranged to normally prevent the bucket from discharging its contents, and means for operating said latch at selective points along said cableway, said means comprising a hood having rollers journaled therein adapted to travel on said cableway, a frame suspended from said hood, means for anchoring said frame, guide rods on said frame, a tripping carriage mounted for sliding vertical movement on said rods, a tripping cam on said carriage, a spring tensioned latch for locking said carriage in its operative position, and means operable from the ground for releasing said latch.

10. In combination with a cableway, buckets having latches to normally prevent them from discharging their contents, a frame sustained by but movable along the cableway and a tripping device slidably mounted on said frame for vertical adjustment into and out of position for engagement with the latches on the buckets.

11. In combination with a cableway, buckets having latches to normally prevent

them from discharging their contents, a frame sustained by but movable along the cableway and a tripping device slidably mounted on said frame and arranged to be moved into and out of position for engagement with the latches on the buckets, and means for holding said tripping device in either its operative or inoperative position.

12. In combination with a cableway, buckets having latches to normally prevent them from discharging their contents, a frame sustained by but movable along said cableway and a tripping device slidably mounted on said frame for vertical movement into and out of position for engagement with the latches on the buckets, and means operable from the ground level for holding said tripping device in either its operative or inoperative position.

13. In combination with a cableway, buckets having latches to normally prevent them from discharging their load, a supporting hood mounted for longitudinal movement along the cableway and having upper longitudinally inclined faces over which said buckets ride, a frame sustained by said hood, a tripping device carried thereby and arranged to be moved into and out of position for engagement with the latches on said buckets, and means for holding said tripping device in either its operative or inoperative position.

14. In combination with a cableway, buckets having latches to normally prevent them from discharging their load, a supporting hood mounted for longitudinal movement along the cableway, a frame sustained by said hood, a tripping device carried thereby and arranged to be moved into and out of position for engagement with the latches on said buckets, a shouldered bar pivotally secured to a support which is vertically adjustable on said frame, said bar being arranged to hold the tripping device in position for engagement with the latches on the buckets and means coacting with said bar whereby the tripping device may be moved to its inoperative position.

15. In combination with a cableway, buckets having latches to normally prevent them from discharging their contents, a longitudinally movable frame sustained by the cableway, a vertically movable tripping carriage slidably mounted on guides secured to said frame, holding means for positioning said tripping carriage in its operative position and a vertically adjustable support for said holding means.

16. The combination with a cableway, of a plurality of automatic dump buckets mounted for movement on said cableway, each of said buckets having a latch arranged to normally prevent the bucket from discharging its contents, an adjustable actuating lever secured to each latch, and means for operating said levers, said means comprising frames suspended from and movable along said cableway, a tripping carriage on each frame mounted for vertical movement, and means for moving said carriages into and out of operative position.

17. The combination with a cableway, of a plurality of automatic dump buckets mounted for movement on said cableway, each of said buckets having a latch arranged to normally prevent the bucket from discharging its contents, an adjustable actuating lever secured to each latch, and means for operating said levers, said means comprising a plurality of frames suspended from and movable along said cableway, a pair of guide rods on each of said frames, a tripping carriage mounted for sliding vertical movement on each pair of rods, a tripping cam rigidly secured to each carriage, means for moving said tripping carriages vertically into and out of operative position, and means for locking said carriages in their operative positions.

18. The combination with a cableway, of a plurality of automatic dump buckets mounted for movement on said cableway, each of said buckets having a latch arranged to normally prevent the bucket from discharging its contents, an adjustable actuating lever secured to each latch, and means for operating said levers, said means comprising a plurality of hoods having rollers journaled therein adapted to travel on said cableway, frames suspended from each of said hoods, means for anchoring said frames, a pair of guide rods on each frame, a tripping carriage mounted for sliding vertical movement on each pair of rods, a tripping cam rigidly secured to each carriage, means for moving said tripping carriages vertically into and out of operative position, and means for locking said carriages in their operative positions.

In witness whereof I have hereunto signed my name.

FREDERICK C. CARSTARPHEN.