No. 888,434. PATENTED MAY 19, 1908.

J. W. WEAVER.

AUTOMATIC DUMPING DEVICE.

APPLICATION FILED JUNE 22, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

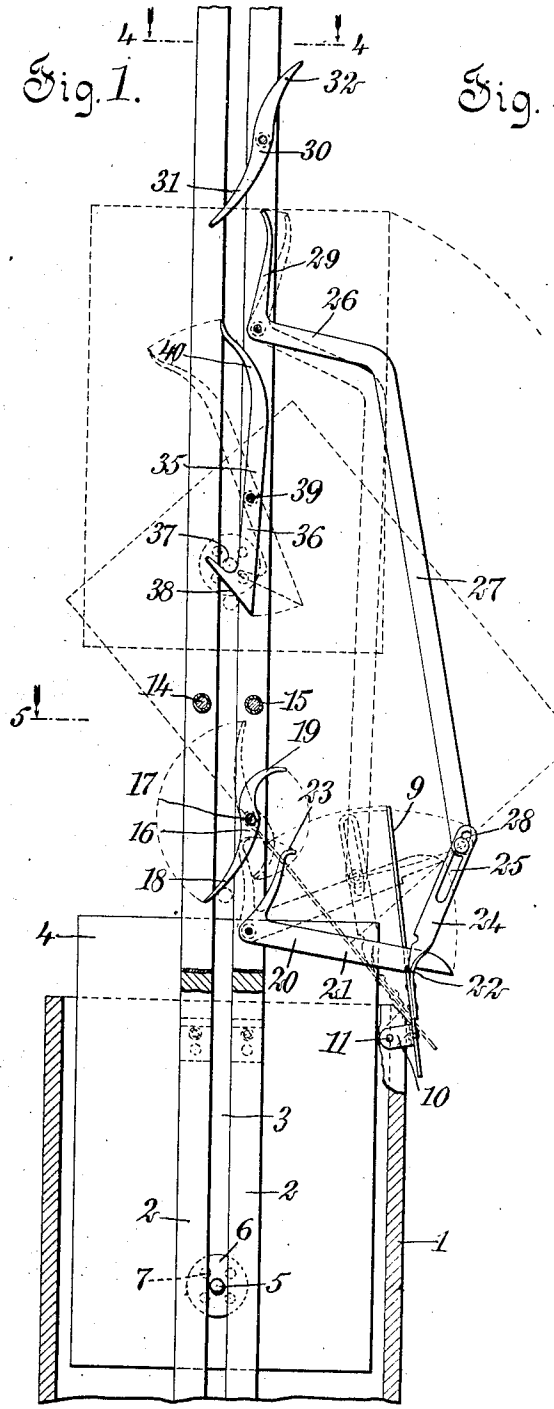
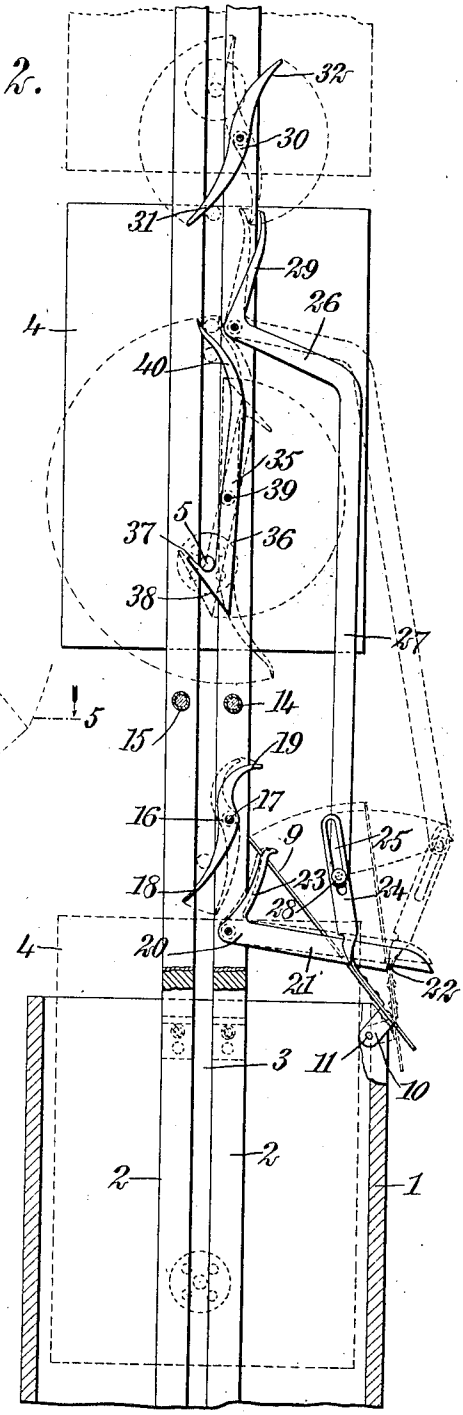


Fig. 2.



WITNESSES

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Fig. 3.

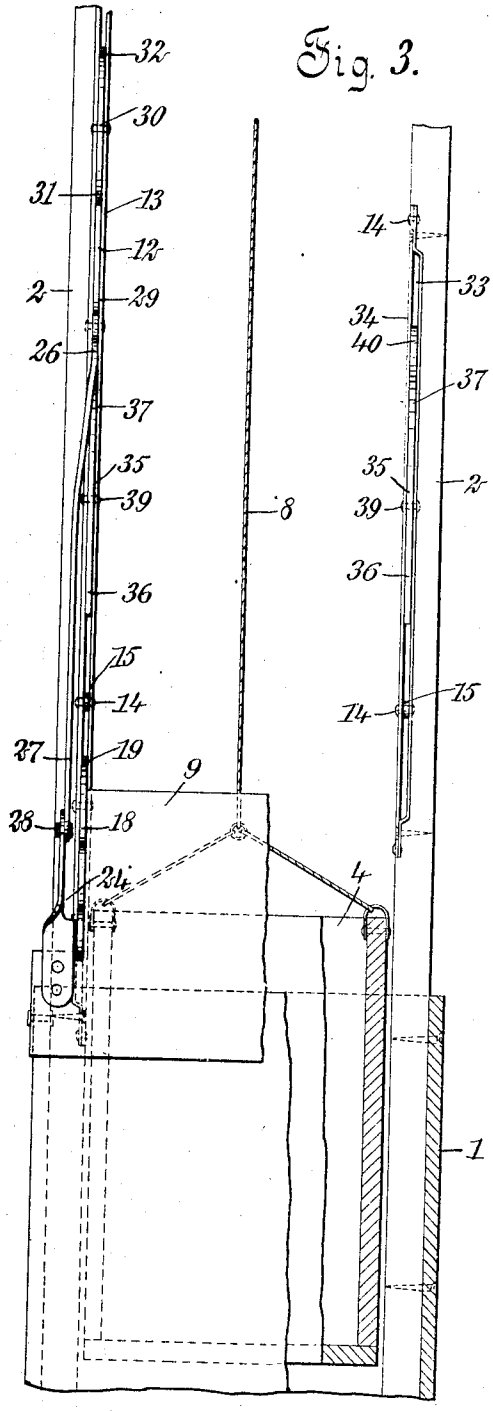


Fig. 4

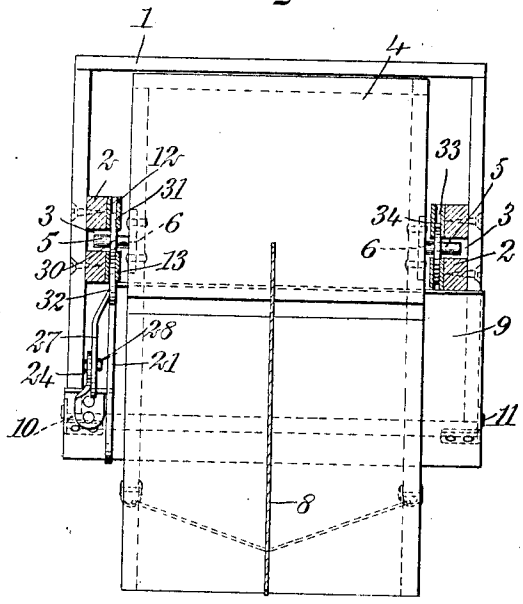
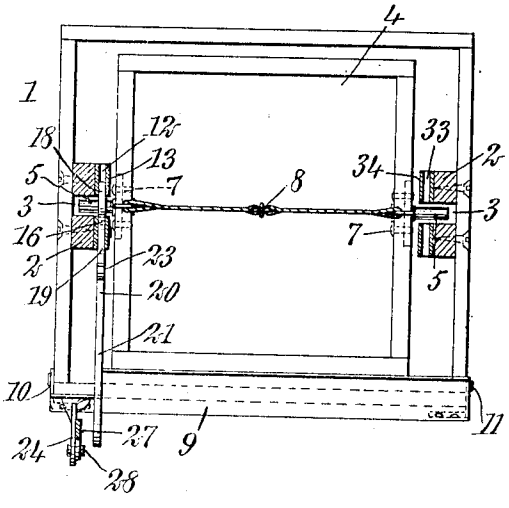


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN WILSON WEAVER, OF SKIDOO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO MATT HOVECK, OF SKIDOO, CALIFORNIA.

AUTOMATIC DUMPING DEVICE.

No. 888,434. Specification of Letters Patent. Patented May 19, 1908.

Application filed June 22, 1907. Serial No. 380,251.

To all whom it may concern:

Be it known that I, JOHN WILSON WEAVER, a citizen of the United States, and a resident of Skidoo, in the county of Inyo and State of California, have invented a new and Improved Automatic Dumping Device, of which the following is a full, clear, and exact description.

This invention relates to automatic dumping devices, and more particularly to that class of dumping device used in connection with mines and excavations.

The object of the invention is to provide a simple, strong and efficient dumping device which is automatic in operation and which has a dumping-bucket operated to dump the contents of the same by the movement of the bucket upon guides.

A further object of the invention is to provide a dumping device having an apron operated by the movement of the bucket, partially to cover the shaft or excavation, to prevent the accidental return of part of the contents of the bucket when the latter is dumped, and having supporting means controlled by the movement of the bucket for holding the bucket in the dumping position.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which

Figure 1 is a side elevation of my invention showing parts in cross-section and indicating different positions of certain parts in dotted outline; Fig. 2 is a similar view showing parts in different positions; Fig. 3 is an elevation showing parts broken away and parts in cross-section; Fig. 4 is a horizontal cross-section on the line 4—4 of Fig. 1; and Fig. 5 is a similar view on the line 5—5 of Fig. 1.

Before proceeding to a more detailed explanation of my invention it should be understood that the same is particularly applicable for use in connection with mines and other excavations. It is customary to provide hoists for removing the ore or excavated material, having buckets for carrying the same, which are raised to a suitable point where the bucket is dumped to empty it of the contents. The dumping of the hoisting buckets is usually manually effected, or requires careful controlling by an operator. To avoid the necessity of an operator for the dumping bucket, I provide automatic means controlled by the movement of the bucket for dumping the same. At the same time, I provide an apron, particularly useful in connection with mine shafts, adapted to be swung into position partially covering the shaft when the bucket passes along the guides, so that when the contents of the bucket are dumped the apron prevents the return of any of the same into the shaft, the apron being at an angle and directing the material away from the edge of the shaft. The operation of the apron is quite automatic, being held in an operative position to permit the passage of the bucket, operated by the movement of the bucket, and again returned to an inoperative position when the bucket returns after dumping.

Referring more particularly to the drawings, 1 represents the walls of a shaft such as is often encountered in mines and the like. At opposite sides of the shaft 1 are arranged parallel members 2 of timber or any other suitable material and separated a suitable distance to constitute guides, the members 2 presenting therebetween a guide-slot 3. I provide a dumping bucket 4 of any preferred or common form and material. The bucket 4 has near the bottom at opposite sides, projecting guide-pins 5 secured by means of a suitable bracket 6 and rivets 7 to the bucket. The pins 5 are arranged at one side of the center of the bucket, so that when the bucket is supported upon the pins the gravitational action of the bucket automatically dumps the same in the direction towards which the pins are offset from the center of the bucket. The bucket may be hoisted in the usual manner by a cable 8 secured to the bucket in any suitable manner. The cable 8 is operated by a hoisting engine of any common or preferred type and the bucket returns into the shaft gravitationally when the drum of the hoisting engine is released.

An apron 9 of sheet metal or any other material suited to the purpose, is hinged by means of laterally-disposed extensions 10 and hinge-pins 11 at the edge of the shaft. When the apron 9 is in a substantially vertical or operative position the bucket can pass freely therebeyond. The apron 9 is arranged

to swing into position against the guides as indicated most clearly in Fig. 2. In the operative position shown in Fig. 2 the apron obstructs the shaft, so that when the bucket is dumped as shown in dotted outline in Fig. 1, the material slides over the apron to the side of the shaft and thus none of the contents of the bucket can possibly fall back into the shaft. One of the guides has an elongated recess 12 at the inner face thereof, with a covering member 13 of sheet metal or the like arranged flush with the face of the guide. The covering member 13 is secured in position by means of suitable bolts or rivets 14 and spacing blocks 15. Pivotally arranged within the recess is a dog 16 pivoted upon a suitable pivot-pin 17. The dog 16 has opposite arms 18 and 19, the arm 18 of which normally projects across the guide groove 3. A bell-crank lever 20 is similarly pivoted in the recess and has an arm 21 presenting a shoulder 22. The shoulder 22 serves to engage the apron 9 at an edge thereof to hold the same in an inoperative position. The bell-crank lever 20 has an operating arm 23. When the bucket passes upwardly along the guides the pin 5 at one side thereof comes into engagement with the arm 18, moving the same upwardly and above the dog 16, so that the arm 19 engages the arm 23 of the lever 20, thereby in turn pivoting the latter and disengaging the arm 21 from the apron 9 to permit the same to fall into an operative position as shown in Fig. 2. The arrangement is such that the arm 18 is operatively engaged by the bucket in its upward movement only, the pin of the bucket, when the latter returns, engaging the dog inoperatively, the bell-crank lever 20 lying undisturbed. The apron 9 has a rigid arm 24 presenting a slot 25. A bell-crank lever 26 is pivoted in the recess 12 above the dog 16, and has an elongated arm 27 disposed towards the apron and presenting a laterally offset pin 28 operatively arranged in the slot 25. The lever 26 has an arm 29 normally lying adjacent to the guide groove 3. A dog 30 is pivoted in the recess 12 and has an arm 31 normally projecting across the guide groove 3, and an offset arm 32. When the bucket is moved upwardly along the guides until a pin 5 comes into engagement with the arm 31 of the dog 30, the latter is swung about its pivot pin, the arm 32 engaging the arm 29 of the bell-crank lever 26. The bell-crank lever 26 is swung about its pivot, the arm 27 moving upwardly to swing the apron 9 into the inoperative position shown in Fig. 1, so that the bucket in its return down the guides can pass freely beyond the apron. The arrangement is such that in its downward movement the bucket inoperatively engages the dog 30, the latter being actuated to operate the apron, only when the bucket moves upwardly upon the guides.

The opposite guide has a similar recess 33 with a covering member 34 secured in position by rivets 14 and spacing blocks 15. The recess 33 is arranged substantially opposite to the portion of the recess 12 between the dogs 16 and 30. Arranged in the recess 12 between the dogs is a swinging supporting member 35 having an arm 36 normally downwardly disposed and presenting a recess 37 and an inclined edge 38. The supporting member 35 is pivotally mounted upon a suitable pin 39 and has a curved arm 40 opposite to the arm 36. A similar supporting member is arranged in the recess 33 of the opposite guide. The arrangement of the supporting members is such that the arm 36 normally presents the recess 37 at the guide groove 3, the inclined edge 38 extending transversely of the guide groove. The arm 40 normally extends in an upwardly-inclined position across the guide groove 3. When the bucket moves upwardly along the guides until the pins 5 come into engagement with the inclined edge 38 of the supporting members, the latter are disposed to one side to permit the bucket to pass beyond the arm 36 to permit the pins 5 to engage the recesses 37. In this way the dumping bucket is pivotally supported by the swinging members 35, and when the hoisting cable is released the bucket automatically swings into the dumping position shown most clearly in Fig. 4.

It will be remembered that the pins 5 are offset to one side to permit the bucket automatically to dump. When the bucket has been emptied of its contents, the cable is operated to bring the bucket into the vertical position and to continue the upward movement of the same upon the guides. In the upward movement the pins 5 pass beyond the arms 40 of the swinging members 35, pushing the latter to one side and above the same and operate the dog 30 to return the apron 9 to the inoperative position. The bucket is then allowed to return downwardly upon the guides. When the pins 5 engage the upper sides of the arms 40 the swinging members are turned upon the pivots and make a complete revolution as the bucket passes thereBeyond, the arm 36 being disposed to one side thereby to permit the unobstructed passage of the pins 5 in the guide grooves 3, the bucket being free to travel down the mine shaft.

The operation of the automatic dumping device of my invention is simple: The loaded bucket in traveling upwardly upon the guides first operates the dog 16, which throws the apron 9 into an inoperative inclined position resting against the guides. Continuing the upward movement, the bucket comes into engagement with the swinging members 35 and is supported thereby. The hoisting cable is released and the bucket dumps automatically. When the bucket is emptied, the

hoisting cable is again operated and the upward movement of the bucket upon the guides is continued until the bucket operatively engages the dog 30, to return the apron 9 to an inoperative position. The hoisting cable is thus released and the bucket gravitationally returns along the guides into the shaft.

It will be understood that the shaft and guides may be inclined at any suitable angle and that the bucket may be of any common or preferred type. The bucket may be operated by any hoisting mechanism suited to the purpose.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, means for advancing said bucket along said guides, and means for pivotally supporting said buckets to dump the contents thereof, said supporting means being displaced by the movement of said bucket upon said guides, said bucket engaging said guides at one side of the center of gravity of the bucket whereby said bucket tends to tilt when the advancing means therefor are not actuated.

2. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, means for advancing said bucket along said guides, means independent of said bucket for pivotally supporting the same to dump the contents thereof, and means controlled by the movement of said bucket for displacing said supporting means to permit the bucket to return upon said guides, said bucket engaging said guides at one side of the center of gravity of the bucket whereby said bucket tends to tilt when the advancing means therefor are not actuated.

3. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides and having pins engaging said guides, said pins being secured to said buckets at one side of the center of the same, and means for engaging said pins pivotally to support said bucket to dump the contents thereof, said supporting means being displaced by the movement of said buckets on said guides.

4. In a device of the class described, in combination, a guide, a bucket arranged to travel upon said guide, a movable supporting member presenting an arm, said arm being adapted pivotally to engage said bucket to support the same to dump the contents thereof, and means controlled by the movement of said bucket for displacing said member.

5. In a device of the class described, in combination, a guide, a bucket arranged to travel upon said guide, and a pivoted supporting member presenting an arm for pivotally holding said bucket to dump the contents of the same, said arm being displaced to engage said bucket by the movement of the same upon said guide, said member being displaced to permit the bucket to return upon said guide by a further movement of the bucket upon said guide.

6. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, and pivoted members having arms normally disposed towards said guides to engage said bucket pivotally to support the same to dump the contents thereof, said members having further arms engaged by said buckets when moving beyond said first arms, whereby said members are displaced to permit the return of said bucket upon said guides.

7. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, and pivoted members having arms presenting recesses and inclined edges, said arms being normally disposed towards said guides, said bucket having projections engaging said inclined edges when said bucket is moved towards said members and displacing said members to permit the engagement of said projections with said recesses to support the bucket to dump the contents thereof, said members having fingers inoperatively engaged by said bucket when the movement of the same is continued beyond said arm, and operatively engaged by said projections in the return movement of said bucket whereby the members are disposed to permit the unobstructed return of said bucket.

8. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, a movable apron between said bodies and independent of said bucket, and means controlled by the movement of said bucket for operating said apron.

9. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, a hinged apron, a stop for holding said apron in an inoperative position, a pivoted member controllable by said bucket to disengage said stop, and means controlled by the movement of said bucket for returning said apron to an inoperative position.

10. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, a hinged apron adapted to swing toward said guides, a pivoted lever removably engaging said apron to hold the same in an inoperative position, a pivoted member operated by the movement of said bucket in one direction to disengage said lever, said member inoperatively engaging said bucket when the same is moved in the other direction, a pivoted arm operatively engaging said apron, and a second

pivoted member operated by the movement of the bucket in one direction to control said pivoted arm, and said second member inoperatively engaging said bucket when the same is moved in the other direction.

11. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, a movable apron, means controlled by the movement of said bucket for operating said apron, and means for pivotally supporting said bucket to dump the contents thereof.

12. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, a hinged apron, means for holding said apron in an operative position, means controlled by the movement of said bucket for operating said apron, and means for pivotally supporting said bucket to dump the contents thereof.

13. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, means for pivotally supporting the said bucket to dump the contents thereof, means controlled by the movement of said bucket for displacing said supporting means to permit the bucket to return upon said guide, a movable apron, and means controlled by the movement of said bucket for operating said apron.

14. In a device of the class described, in combination, guides, a bucket arranged to travel upon said guides, pivoted members presenting arms for pivotally holding said bucket to dump the contents thereof, said arms being displaced to engage said bucket by the movement of the same upon said guides, said members being further displaced to permit the bucket to return upon said guides by the movement of said bucket in the opposite direction, a hinged apron, a stop for holding said apron in an inoperative position, a pivoted releasing member controllable by said bucket to disengage said stop, and means controlled by the movement of said bucket for returning said apron to an inoperative position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN WILSON WEAVER.

Witnesses:

AUSTIN YOUNG,

J. FRED DULING.