No. 723,771. PATENTED MAR. 24, 1903.

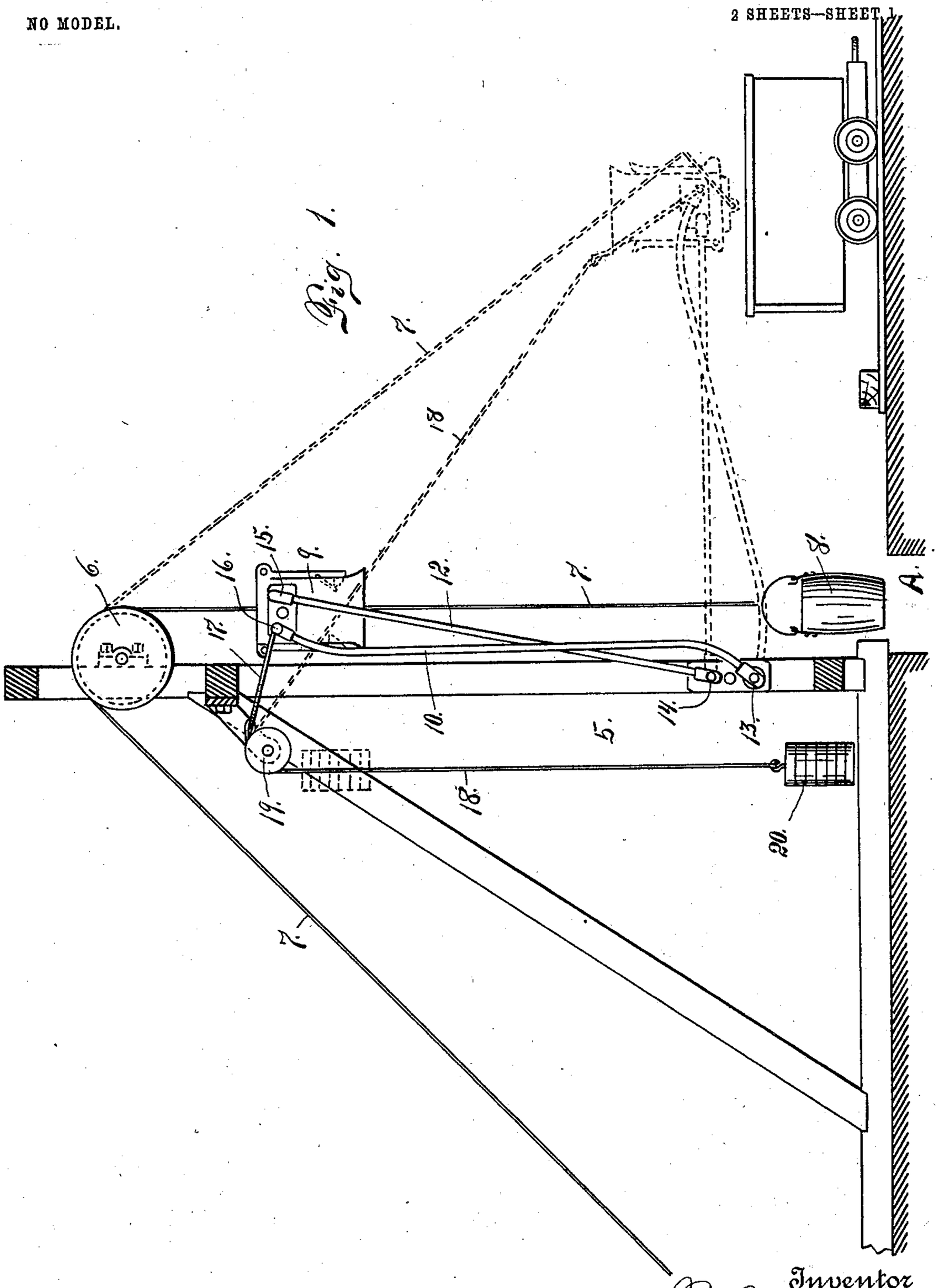
T. E. ANDERSON.

BUCKET DUMPING APPARATUS.

APPLICATION FILED DEC. 9, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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NO MODEL. 2 SHEETS—SHEET 2.

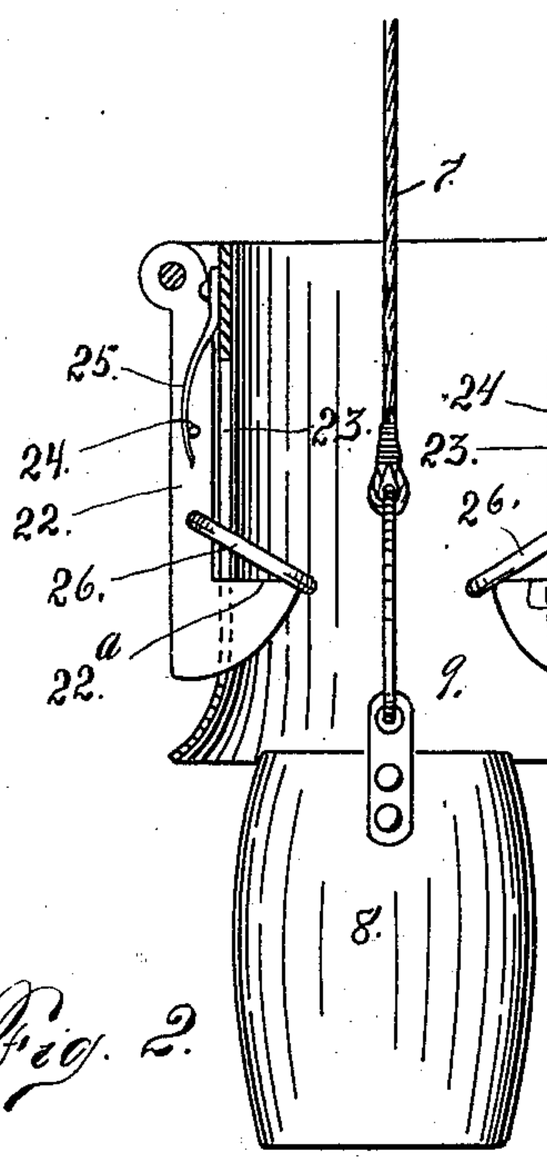

Fig. 2.

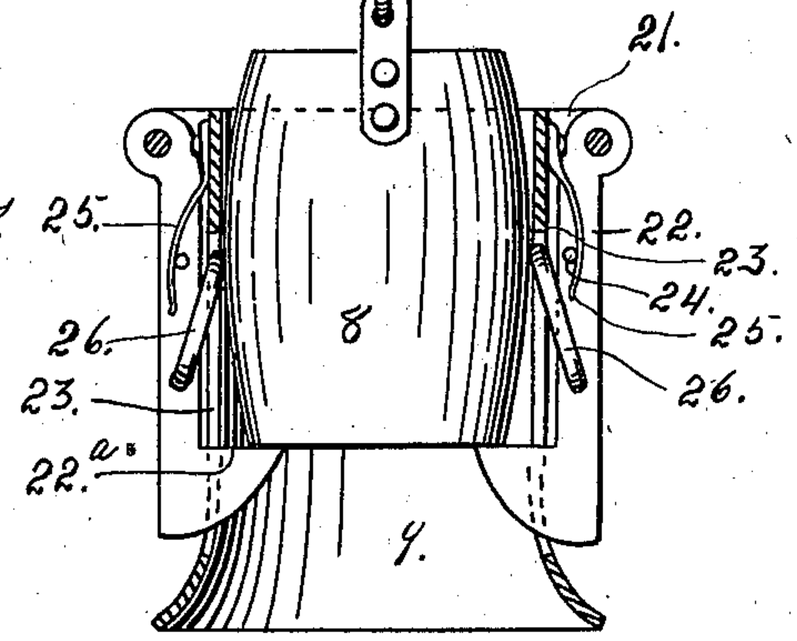

Fig. 3.

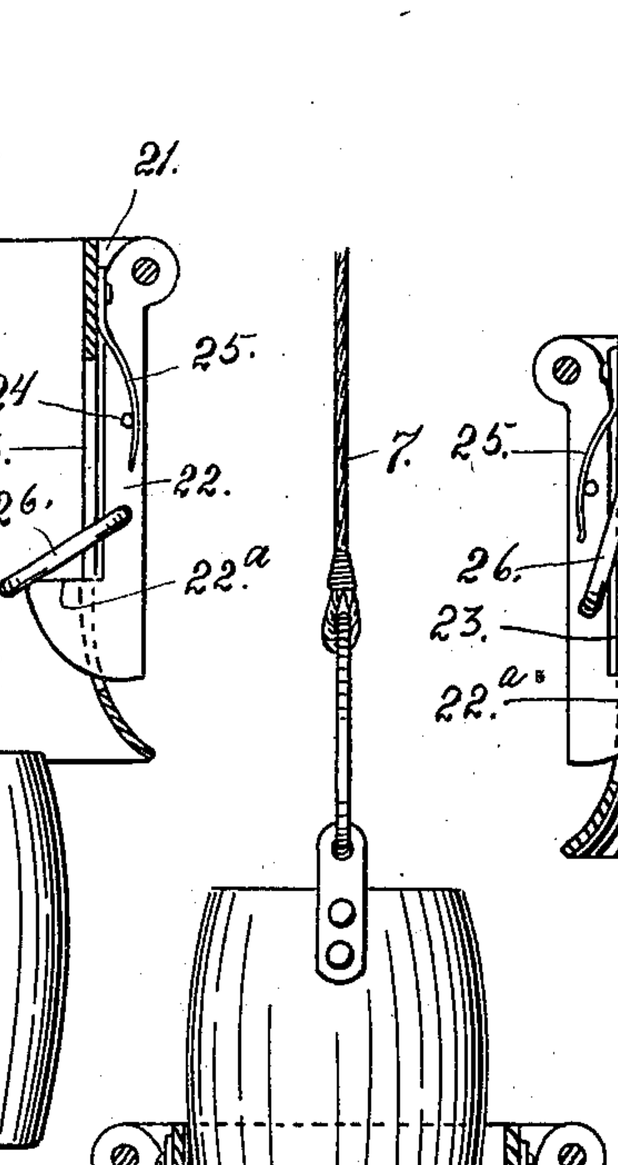

Fig. 4.

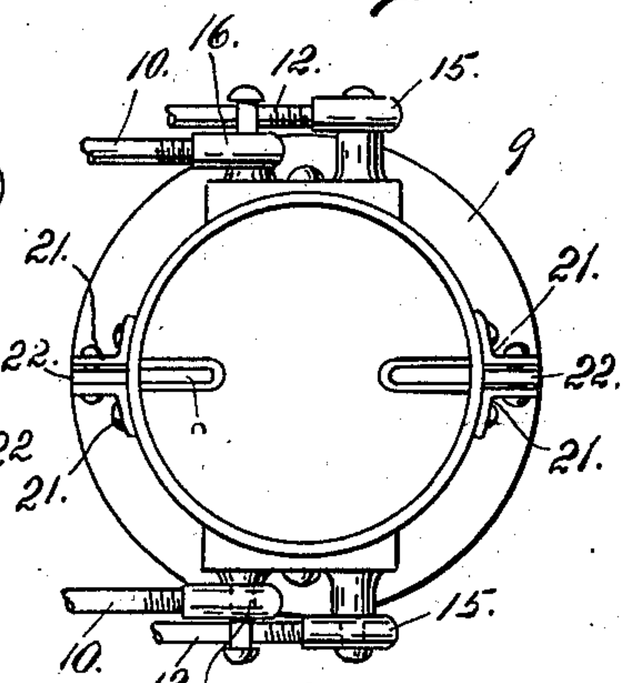

Fig. 5.

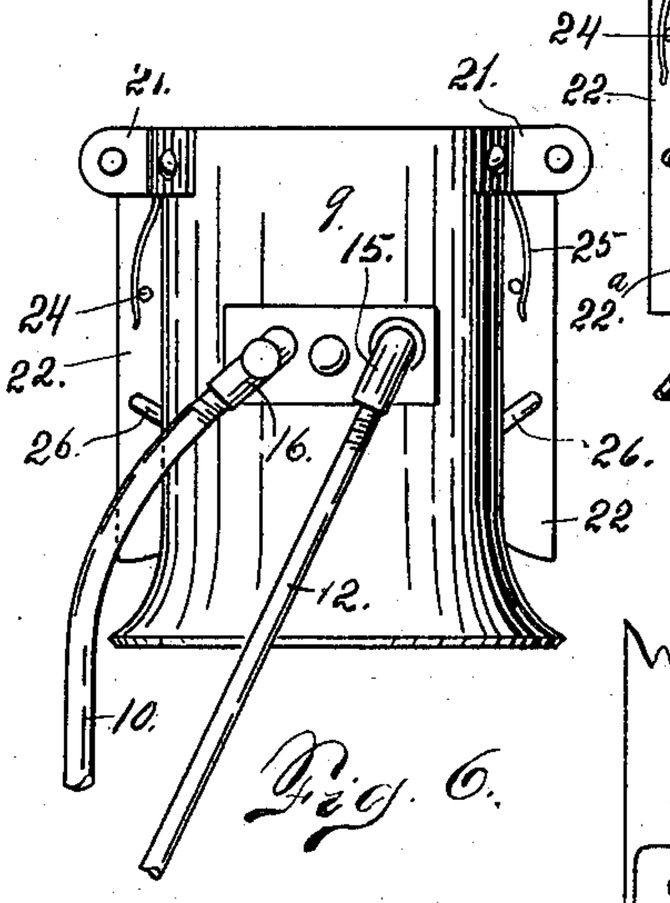

Fig. 6.

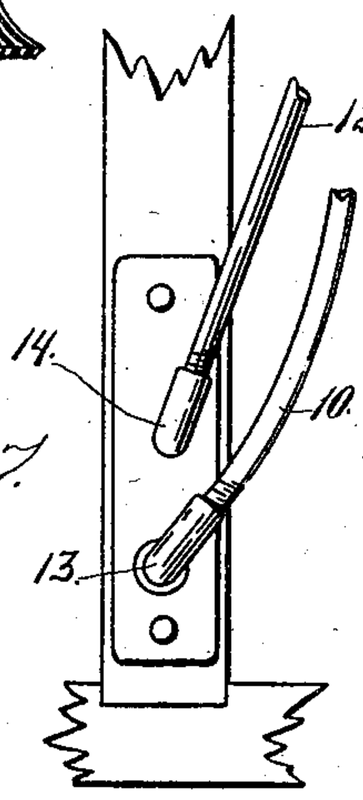

Fig. 7.

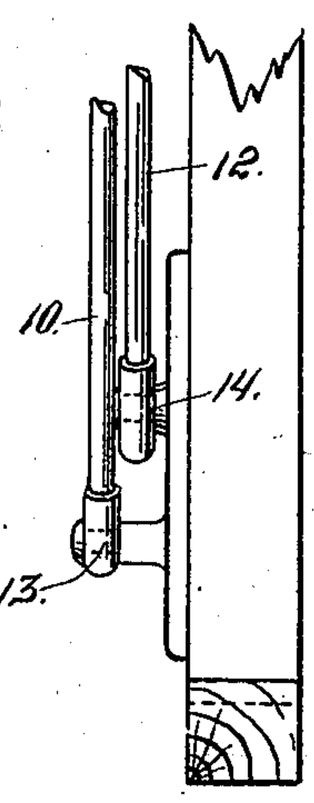

Fig. 8.

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UNITED STATES PATENT OFFICE.

TURY E. ANDERSON, OF DENVER, COLORADO.

BUCKET-DUMPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 723,771, dated March 24, 1903.

Application filed December 9, 1902. Serial No. 134,579. (No model.)

To all whom it may concern:

Be it known that I, TURY E. ANDERSON, a citizen of the United States of America, residing in the city of Denver, Arapahoe county, and State of Colorado, have invented certain new and useful Improvements in Bucket-Dumping Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in bucket-dumping apparatus, being more especially intended for use in dumping loaded buckets as they are drawn from mining-shafts. The invention will, however, be found equally advantageous in other relations where buckets are to be dumped.

Briefly stated, the apparatus consists of a bucket-holder mounted on links connected with a suitable frame and arranged to invert the bucket-holder as the latter moves downwardly from the normal or elevated position, in which it is held by a counterbalance-weight until the loaded bucket is in place, when the bucket-holder and bucket overcome the counterbalance and move downwardly together until the bucket is dumped into a suitable receptacle, as a car. The bucket-holder is provided with two dogs exteriorly pivoted and whose holding extremities normally enter openings in the wall of the holder far enough to support the bucket when the latter is in position. The dogs are spring-held in the normal position. They are provided with pivoted links forming guards to prevent the dogs from catching the bucket as the latter descends after each dumping act. As the bucket is drawn up through the holder the link-guards are raised and held in the raised position, allowing the dogs to engage the bottom of the bucket, which remains in position in the holder until the bucket is dumped and the bucket and holder are again returned to the elevated position, after which a slight upward movement of the bucket releases the guards and allows them to drop, whereby as the bucket is lowered the latter engages the guards and forces the dogs outwardly, permitting the bucket to move downwardly into the shaft.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a side elevation of my improved bucket-dumping apparatus shown in two positions, one being in full lines and the other in dotted lines. In this view the frame is shown in section and one half removed to better disclose the mechanism. Fig. 2 is a section taken through the bucket-holder, showing the bucket below the holder about to enter the same, the parts being shown on a larger scale. Fig. 3 is a similar view showing the bucket in position in the holder ready to begin the dumping act. Fig. 4 shows the bucket raised to allow the guards to fall to position on the dogs preparatory to the descent of the empty bucket. Fig. 5 is a top view of the bucket-holder shown in detail, the supporting-links being broken away. Fig. 6 is a side elevation of the same shown in the upright position. Figs. 7 and 8 illustrate the lower extremities of the links, showing their connection with the frame.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a suitable framework ordinarily termed a "gallows-frame." Upon the upper part of this frame is mounted a sheave 6, over which the cable 7, connected with a bucket 8, passes. The bucket-holder 9 is connected with the frame by two links 10 and 12, which are pivotally connected with the frame at one extremity, as shown at 13 and 14, while their opposite extremities are pivotally connected with the bucket-holder, as shown at 15 and 16. This holder is provided with a bail 17, to which is connected a cable 18, passing over a sheave 19, the opposite extremity of the cable being provided with a counterbalance-weight 20 of sufficient gravity to support the bucket-holder when free from a loaded bucket. The upper extremity of the bucket-holder is provided on each side with a pair of ears 21, be-

tween which is pivoted the upper extremity of a dog 22. In the plane of the dogs and below their upper extremities the bucket-holder is slotted, as shown at 23, to allow the hooked lower extremities of the dogs to enter the interior of the holder far enough to support the bucket when the latter is in the position shown in Fig. 3. Each dog is provided with a pin 24, engaged by a leaf-spring 25, which normally holds the dog in the position shown in the said figure. Each dog is provided with a short link 26, which is pivoted thereon and normally engages the holding extremity of the dog. (See Fig. 4.)

In describing the operation of the apparatus I will assume that the parts are in the position shown by full lines in Fig. 1 of the drawings. As the bucket 8 is drawn upwardly it enters the bottom of the bucket-holder, which is outwardly flared for the purpose. As the bucket continues its upward movement it strikes the curved lower extremities of the dogs and forces the latter outwardly far enough to permit the upward travel of the bucket, which, however, strikes the links and lifts them to the position shown in Fig. 3. As soon as this occurs the dogs swing inwardly to their normal position, bringing their horizontal offsets or faces 22ª under the bottom of the bucket, whereby the latter is held securely in place. The cable 7 is then slackened and the gravity of the loaded bucket overcomes the counterweight 20, and the bucket and holder move to the dotted-line position in Fig. 1, the holder and bucket being inverted during the downward travel. The tipping action of the bucket and bucket-holder is due to the peculiar arrangement of the links 10 and 12. The link 10 is located outside of the link 12. The link 10, as shown in the drawings, is the longer and is pivoted to the frame below the lower extremity of the link 12. The link 10 is connected with the bucket-holder at a point in the same horizontal plane with but forward or to the left of the point where the link 12 is connected with the said holder, referring to Fig. 1 of the drawings. These links are both connected near the top of the bucket-holder and their points of connection are on opposite sides of the vertical center of the holder. Hence as the bucket-holder descends the two links act in harmony or coöperate to perform the tipping or dumping function, as will be readily understood by reference to Fig. 1. When the parts are in the position shown by dotted lines in Fig. 1, the counterweight is raised to the dotted-line position in the same figure. After the bucket is dumped the pull on the cable 7 returns the bucket and holder to the elevated position. These parts then occupy the position shown in Fig. 3. Then a slight upward movement of the bucket lifts it to the position shown in Fig. 4, when the guard-links drop to the position shown in the same figure, after which the bucket will pass freely down through the bucket-holder and thence into the shaft A for another load, after which the operation just described will be repeated.

Having thus described my invention, what I claim is—

1. In a bucket-dumping apparatus, the combination with a suitable frame, of a bucket-holder, a counterbalance normally holding the holder in the elevated position and in the path of the bucket to be dumped, and means connected with the bucket-holder for supporting the latter in operative position on the frame and adapted to invert the holder and bucket as they are carried downwardly by the gravity of the load which overcomes the counterbalance.

2. A bucket-holder comprising a casing adapted to receive the bucket and provided with two spring-held dogs pivoted on the casing, one on each side, and normally entering the casing to support the bucket, and guards mounted on the holder and adapted to engage the dogs to prevent the bucket from catching on the dogs during its downward movement, but which guards are in the path of the bucket during its upward movement and are by it raised to allow the bucket to be engaged by the dogs while the guards are held between the bucket and the casing of the holder.

3. In bucket-dumping apparatus, the combination with a frame, of a bucket-holder provided with bucket-holding dogs and guards as described, a counterbalance connected with the holder, and swinging means mounted on the frame, connected with the bucket-holder, and arranged to invert the latter as it moves downwardly, substantially as described.

4. In bucket-dumping apparatus, the combination of an open-ended bucket-holder provided with pivoted, spring-held bucket-holding dogs, guards adapted to engage the dogs and arranged to be lifted by the bucket when moving in one direction, and preventing the bucket from catching on the dogs when the bucket is moving in the opposite direction, and links connected with the bucket-holder and arranged to invert the same as the latter moves downwardly, substantially as described.

5. In bucket-dumping apparatus, the combination with a suitable frame, of an open-ended bucket-holder, a counterbalance connected therewith to hold it normally in the elevated position and in the path of the bucket, and two links connected with the bucket-holder on each side and mounted to swing on the frame, the arrangement being such that as the bucket-holder moves downwardly by gravity, it is inverted to empty the bucket, substantially as described.

6. The combination of a bucket-holder provided with spring-held bucket-holding dogs, and guards for the dogs arranged as described, and links for supporting the bucket-

holder in the path of the bucket and arranged to invert the bucket-holder and bucket as they swing downwardly.

7. In bucket-dumping apparatus, the combination with a suitable frame, of a bucket-holder open at both ends to receive the bucket, a counterbalance for supporting the holder in the path of the bucket, means mounted on the holder for supporting the bucket when it approaches in one direction and allowing it to pass through when it enters from the opposite direction, and two pairs of links arranged to swing on the frame and connected with the bucket-holder, one pair on each side, the arrangement being such that the links tip the bucket-holder sufficiently to dump the bucket as the latter moves downwardly with the holder.

In testimony whereof I affix my signature in presence of two witnesses.

TURY E. ANDERSON.

Witnesses:

DENA NELSON,

A. J. O'BRIEN.