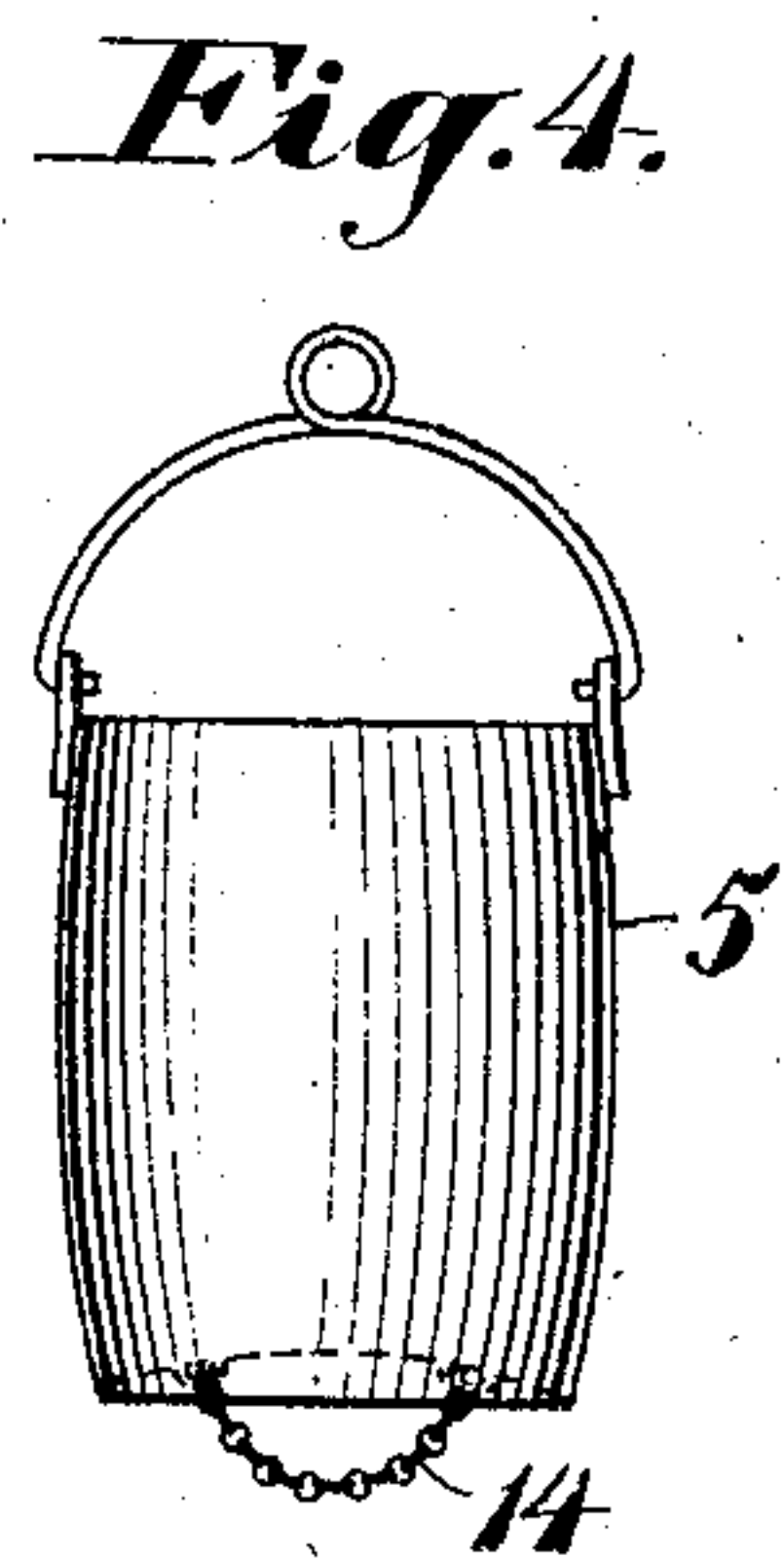
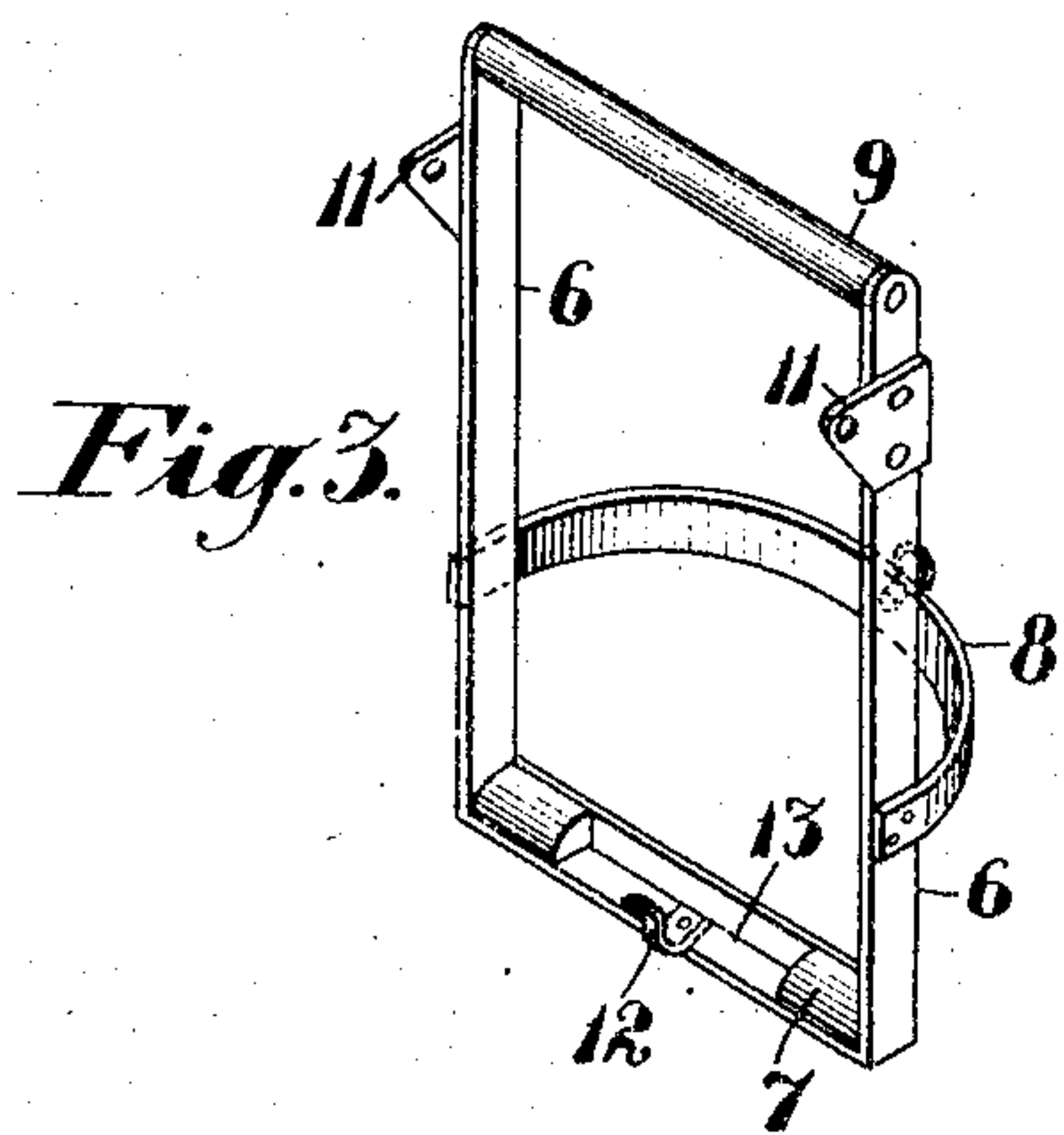
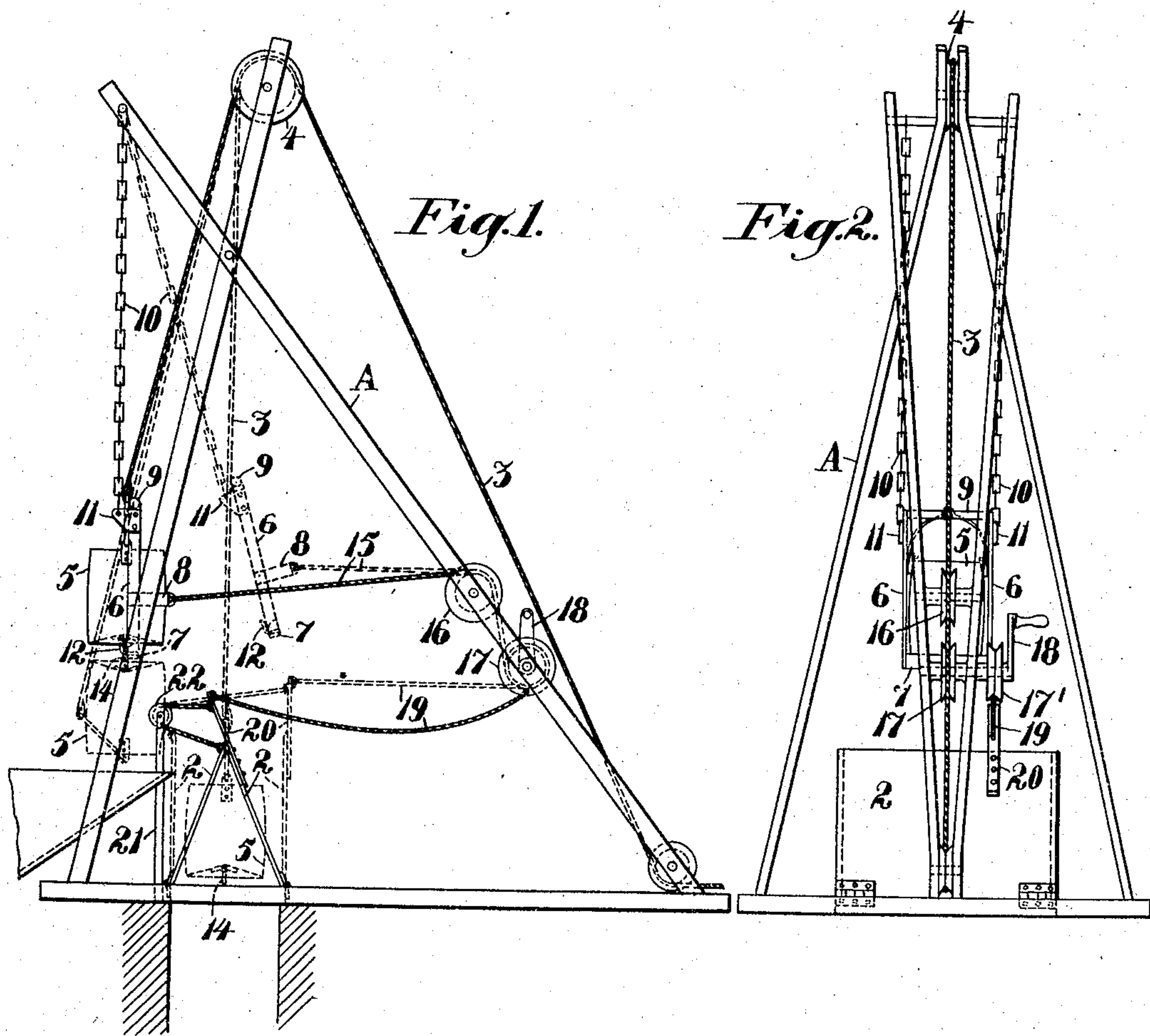


No. 780,629.

PATENTED JAN. 24, 1905.

W. R. WILCOX.
MINING_BUCKET DUMPING APPARATUS.
APPLICATION FILED FEB. 16, 1904.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM R. WILCOX, OF BOISE, IDAHO.

MINING-BUCKET-DUMPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 780,629, dated January 24, 1905.

Application filed February 16, 1904. Serial No. 193,775.

To all whom it may concern:

Be it known that I, WILLIAM R. WILCOX, a citizen of the United States, residing at Boise, in the county of Ada and State of Idaho, have
 5 invented new and useful Improvements in Mining-Bucket-Dumping Apparatus, of which the following is a specification.

My invention relates to improvements in mining apparatus, and particularly in means
 10 for dumping the bucket, in means for closing the mouth of the shaft, and in means for operating said closing means and said dumping means coördinately.

It consists of the parts and the construction
 15 and combination of parts, as hereinafter more fully described, having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of my invention. Fig. 2 is a front view of same. Fig. 3 is a detail
 20 of the bucket-dumping bridle. Fig. 4 is a detail of the bucket.

A represents a suitable framework or galls supporting the parts of my apparatus and disposed in proper relation to the mouth
 25 of the shaft, which is normally closed by the hinged doors or hatches 2.

3 is a hoisting-rope passing over a sheave 4 in the frame and attached to the bucket 5 and
 30 operated from any suitable source of power.

The bucket as it is supported from sheave 4 would normally depend over the shaft-opening.

It is desired that when the bucket is lowered into the shaft or is about to be lowered the
 35 hatches should be open and that when the loaded bucket is hoisted out of the shaft and during the dumping of the bucket the hatches should be closed, since the laws of many States require the shaft-opening to be covered during
 40 the dumping operation. It is further desired that the dumping of the bucket and the opening and closing of the hatches be done automatically and that the opening and closing of the hatches be done coördinately with the op-
 45 eration of the dumping mechanism.

In the present instance I have shown the following mechanism for effecting the desired ends: A dumping-bridle consisting of the side
 50 bars 6, a bottom support 7, a segmental rear brace 8, and a top roller or bar 9 is suspended

by chains or other suitable flexible connections 10 from an elevated part of frame A and forward of sheave 4. The chains attached to the lugs 11 on the bridle or in such other
 55 suitable manner as to cause the bottom of the bridle to tip forward, so that the hook member 12, carried in a recess 13 on support 7, may always engage the pendent coupling member 14 on the bottom of the bucket when the lat-
 60 ter is lowered to rest upon support 7. The bridle may be drawn back out of the path of the bucket by means of a cord 15 passing over a guide-sheave 16 on the frame and attaching to a drum 17, operated, for example, by the crank
 65 18. Ordinarily, except during dumping operations, the bridle would be drawn back, the hoisting-rope 3 passing down in front of roller or bar 9. The opening of the hatches is effected by means of a cord 19, attached to drum 17,
 70 operable in unison with drum 17 and connecting with an arm 20 on the nearer hatch. Opposed to arm 20 is an upright 21, having a sheave 22, around which is rove a cord with one end attached to arm 20 and the other to
 75 the farther hatch. Thus when crank 18 is actuated to turn drum 17 in one direction the hatches are opened simultaneously with the rearward swing of the dumping-bridle, and vice versa, when the drum is turned in the
 80 opposite direction the hatches are closed simultaneously with the forward swing of the bridle, which is the dumping position. (Shown in full lines, Fig. 1.)

In operation with the hatches open and the bridle retracted the bucket may descend un-
 85 impeded into the shaft or raised therefrom. The bucket having been brought up to a point so that the bottom of the bucket is above the path of the bottom 7 of the bridle, the latter is released, and simultaneously the hatches
 90 are closed. As the bucket is lowered member 14 engages hook 12, and the weight of the bucket is transferred from the rope 3 to the bridle and chains 10, and the dump is finally
 95 dropped into an ore-car or other suitable receiver located in front of the hatches. The segmental brace 8 serves to support the bucket at the rear when resting on support 7 and in-
 100 sures the bucket dumping forward when tension is released on the hoisting-rope. The

roller or bar 9 coöperates with the bail of the bucket to turn the latter to bring the member 14 always into position to be engaged by hook 12 when the bucket is lowered into the
 5 bridle. By flexibly suspending the bridle, as by the chains 10, danger of wrecking the apparatus is avoided in case the operator should in hoisting carelessly or accidentally catch the bucket beneath the bridle or the bar 9. This
 10 is an important feature.

In Fig. 4 I have shown the coupling member 14 as comprising a short piece of chain secured at its ends to the bottom of the bucket and lying in a plane coincident or parallel
 15 with the plane of the bail of the bucket. The chain forms a flexible loop in lieu of a rigid ring, which latter has been found liable to be flattened and jammed out of shape by rough usage of the heavy bucket, or where a ring is
 20 used the bottom of the bucket is liable to become dented and destroy the relation between the ring and hook 12, so that the bucket will not always catch on the hook. Moreover, the chain has the advantage, because it loops
 25 from two widely-separated points, while the ring's support is more in the nature of a swivel, causing the ring to turn into a plane more or less transverse to the plane of the bail.

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

1. In apparatus of the class described the combination of hinged hatches, a bucket movable in the line of said hatches, a dumping
 35 mechanism including a freely-suspended bridle movable in horizontal planes and interposable in the path of said bucket, and unitary means for operating both the hatches, and the said dumping mechanism.

40 2. In apparatus of the class described, the combination with a shaft-opening or the like, of a closure therefor, a bucket movable in the line of said opening, a dumping mechanism interposable in the path of said bucket, said
 45 mechanism including a bridle flexibly suspended from a point in advance of said bucket and adapted to have a movement in a horizontal direction to intercept the bucket, and unitary means for opening and closing said
 50 closure and operating the said dumping mechanism.

3. In apparatus of the class described, the combination with a shaft or like opening, a hinged closure therefor, a bucket suspended
 55 in line with said opening, a flexibly-suspended dumping mechanism oscillating in a horizontal direction in the path of the bucket and unitary means for operating said closure and dumping mechanism coördinately.

60 4. In apparatus of the class described, the combination with a shaft-opening or the like, of a closure, a bucket dependent from above and in line with said closure, dumping mechanism interposable in the path of said bucket,
 65 said mechanism including a bridle flexibly

suspended from a point in advance of said bucket and adapted to have a movement in a horizontal direction to intercept the bucket, and unitary means for simultaneously closing
 70 said closure and moving said dumping mechanism into the path of said bucket.

5. In apparatus of the class described, the combination with a shaft-opening or the like, of a closure, a bucket dependent from above and in line with said closure, dumping mechanism
 75 interposable in the path of said bucket, said mechanism including a bridle flexibly suspended from a point in advance of said bucket and adapted to have a movement in a horizontal direction to intercept the bucket,
 80 unitary means for simultaneously closing said closure and moving said dumping mechanism into the path of said bucket, and unitary means for opening said closure and moving said dumping mechanism out of interference
 85 with said bucket.

6. In apparatus of the class described, the combination with a shaft-opening or the like, of opposed hinged hatches, a pulley disposed relative to said hatches, a cord passing around
 90 said pulley and having one end attached to one of said hatches and the other end to the other hatch, and means to operate one hatch to open and close both.

7. In apparatus of the class described, the
 95 combination with a shaft or like opening, of a hinged closure therefor, a frame relative to said opening, a bucket suspended in the line of said opening, a dumping mechanism suspended in advance of said bucket and oper-
 100 atable across the path thereof, said mechanism including an open frame freely suspended from a point in advance of said bucket and adapted to have a movement in a horizontal
 105 direction to intercept the bucket and connections between said dumping mechanism and closure for operating the same coördinately.

8. In apparatus of the class described, the combination of a suitable support, a bucket
 110 suspended therefrom, and a dumping mechanism flexibly suspended from a point in advance of the bucket and arranged to oscillate in an arc to intercept the bucket, said dumping mechanism including a frame open on one
 115 side and having a rigid bottom bucket-support, and a hook recessed in said support, and means on the bucket to engage said hook.

9. In apparatus of the class described, the combination of a suitable support, a bucket
 120 suspended therefrom, a dumping mechanism, including a frame open in front and having a rigid bottom portion, flexibly suspended from a point in advance of said bucket and arranged to have the bottom of said frame project forward, said frame adapted to oscillate
 125 in an arc to intercept the bucket.

10. In apparatus of the class described, the combination of a suitable support, a bucket
 130 suspended therefrom, a dumping mechanism suspended from a point in advance of the

bucket and interposable in the path thereof, said dumping mechanism including a frame open on one side and having means to support the bottom of the bucket, the suspensory means of said frame arranged to cause the bottom thereof to be projected forward.

11. In apparatus of the class described, the combination of a suitable support, a bucket suspended therefrom, a dumping mechanism suspended from said support and oscillating in an arc to intercept the bucket, said dumping mechanism including a frame open at one side and suspended from a point in advance

of said bucket and adapted to have a movement in a horizontal direction to intercept the bucket, and hook member interposable in the path of the bucket, and a flexible coupling member as chain 14 on the bucket to engage said hook.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM R. WILCOX.

Witnesses:

S. H. NOURSE,
JESSIE C. BRODIE.