

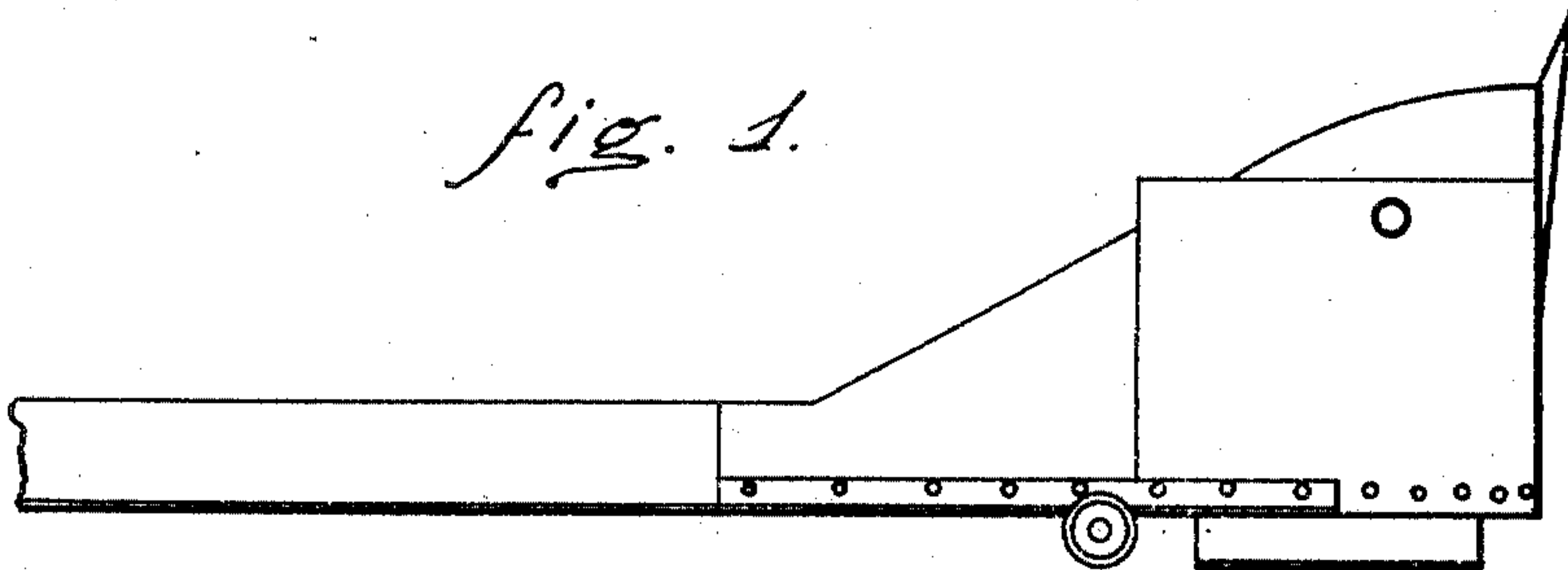
No. 776,105.

PATENTED NOV. 29, 1904.

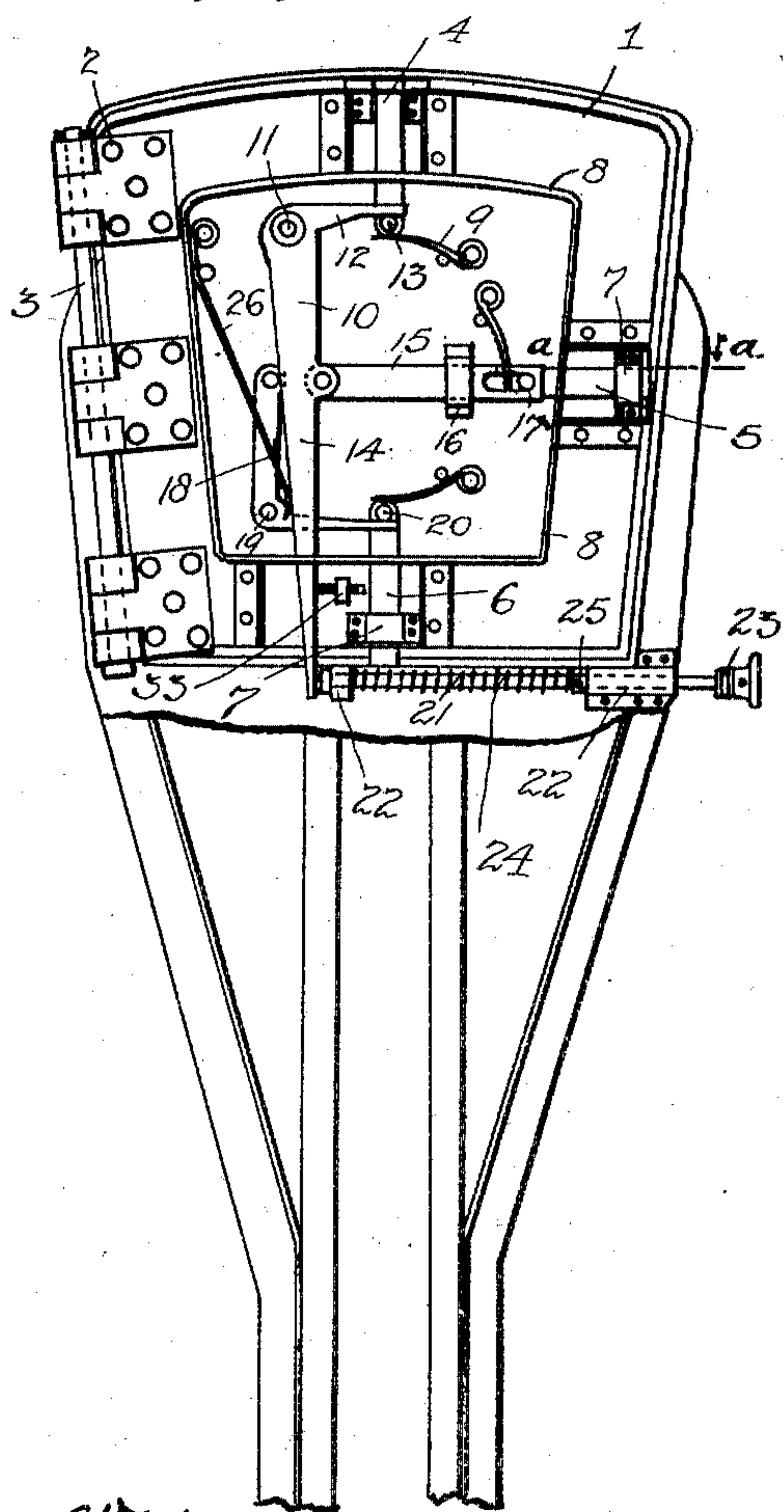
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DIPPER FOR MINING MACHINERY.  
APPLICATION FILED DEC. 21, 1903.

NO MODEL.

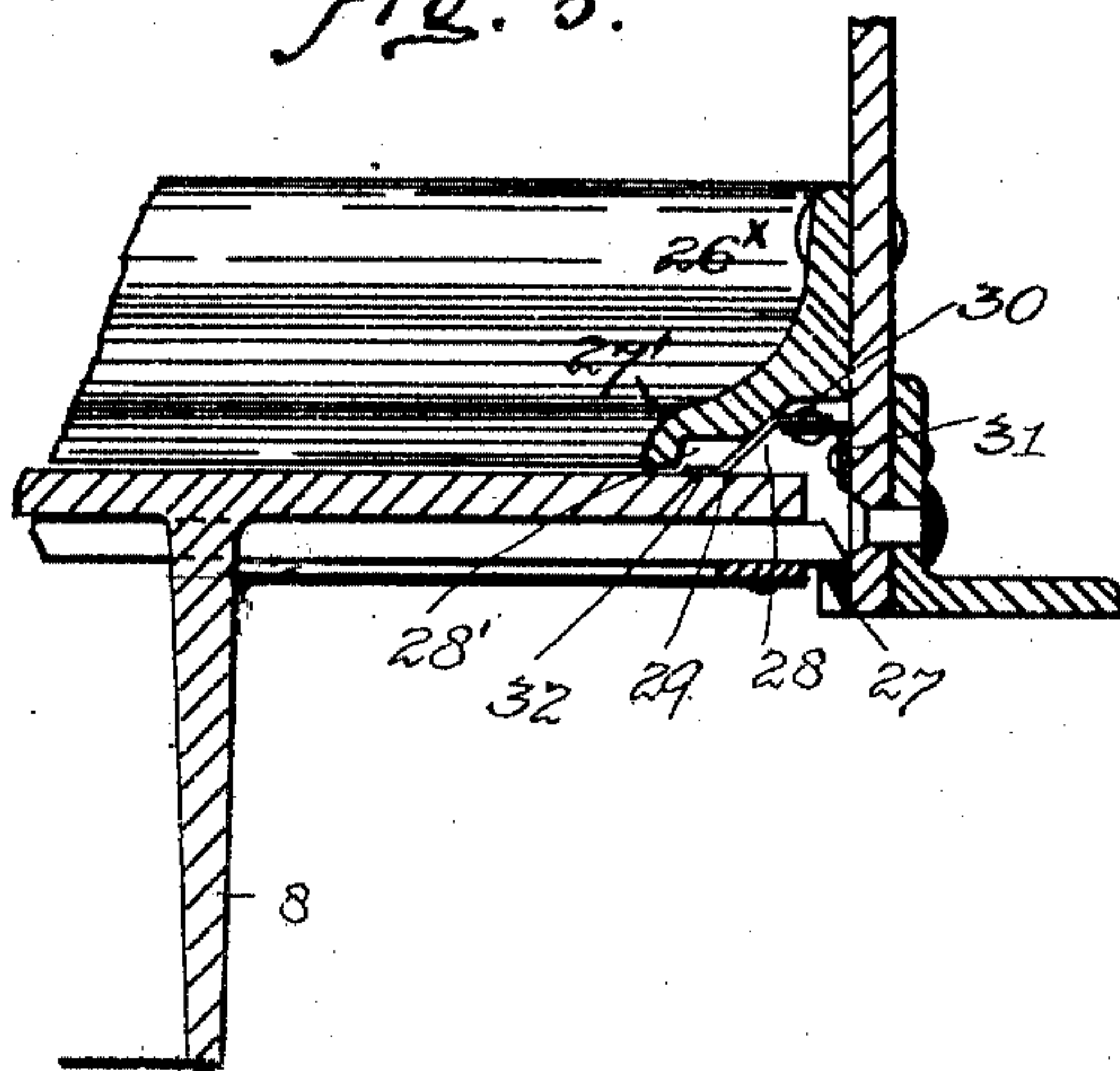
*fig. 1.*



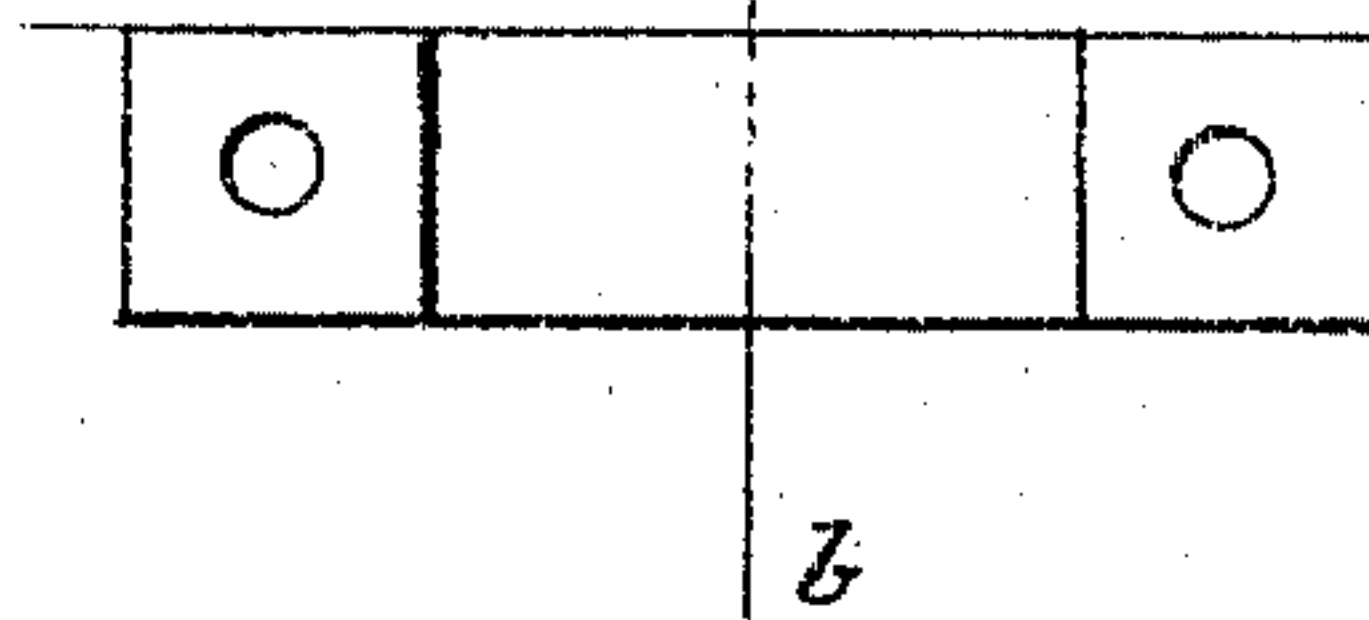
*fig. 2.*



*fig. 3.*



*fig. 4.*



Witnesses:  
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# UNITED STATES PATENT OFFICE.

ERASTUS S. BENNETT, OF NEW YORK, N. Y.

## DIPPER FOR MINING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 776,105, dated November 29, 1904.

Application filed December 21, 1903. Serial No. 186,045. (No model.)

*To all whom it may concern:*

Be it known that I, ERASTUS S. BENNETT, a citizen of the United States, residing at New York city, New York, have invented certain new and useful Improvements in Dippers for Mining Machinery, of which the following is a specification.

My invention relates to mining or excavating apparatus, and particularly to the shovel or dipper for taking up the placer or other material and carrying it to the apparatus for separation or treatment.

In placer-mining it is frequently desired to operate along river-beds where the free gold is contained in material under the water as well as in the solid material above the water-surface, and it is desirable under such circumstances to provide a dipper which will be liquid-tight and will convey its entire contents to the separator or other apparatus without losing a part of it in transit.

It is the object of my invention to provide a dipper of strong construction, simple and positive in its operation, and one which will prevent the escape of its liquid contents. In providing a liquid-tight joint between the door and the body of the dipper I aim to avoid the use of stationary or fixed packing, which under the pounding action of the door thereon is liable to be quickly worn out and to such damage as to render it practically useless after a short period of use. I aim to employ a packing which will accommodate itself to the joint to be sealed and which will be protected from any abrading action of the material.

The features of my invention and the combination and arrangement of parts which also constitute a part of said invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the dipper or shovel. Fig. 2 is a bottom plan view; and Figs. 3 and 4 are detail views, the former being a section of a part of the bucket or dipper and the latter being a detail view of a catch used on the bucket.

The general form of the bucket is shown in Fig. 1, and one feature of the present construction is that the bottom door is hinged at

the side of the dipper or bucket instead of at the back. The door is shown at 1, having hinges 2, by which the said door is hinged to a rod 3, extending along one of the lateral edges of the bucket or dipper, so that instead of swinging in a direction longitudinally of the dipper-handle the door in the present construction will swing down toward one side of the dipper. For holding the door in position securely at all points around its edges I employ a series of catch-bolts 4, 5, and 6, one of these being used for each of the free edges of the door. These bolts are carried by the door and are guided through blocks 7 and also through openings in a flange 8, which extends continuously around the lower face of the door at a slight distance from the edge thereof. The inner ends of the bolts lie within the space inclosed by the said flange, and in this space also are located a series of springs 9, which, pressing on the inner ends of the bolts or latches, tend to force the same outwardly. In order to retract the bolts or latches, I employ a lever 10 of bell-crank form, pivoted at 11 within the space inclosed within the flange 8, one arm of the said bell-crank lever, as at 12, engaging a pin 13 on the latch or bolt 4 to retract the same and said lever having a long arm 14, to which at about the central point of the door a bar 15 is connected, sliding through a guide 16 on the door and having a slot-and-pin connection with the bolt 5. The arm 14 of the said lever is also connected with a supplemental bell-crank lever 18, pivoted at 19 to the bottom of the door and having an arm engaging a pin 20 on the bolt or latch 6. The arm 14 of the main lever extends through and out beyond the flange 8, and its outer end is in range with an operating-rod 21, slidable in bearings 22, fixed to the main frame of the bucket and arranged to be operated when the bucket is swung into a certain position by its knob 23 striking a suitable projection located on the fixed framework of the apparatus or in any suitable way. The rod 21 is normally retracted by a spring 24, surrounding the rod and pressing at one end against one of the bearings or guides 22 and at its opposite end against a collar 25 on the said rod 21. When the rod is operated,



it will engage the lever-arm 14, and through the described connections all of the latch-bolts will be retracted, and the door will then be free to swing downwardly on its hinged connection, which, as before stated, extends along one of the lateral edges of the door-opening. The lever 10 is pressed in one direction by a spring 26, and when the door is closed the latches are in position to engage the catches on the door-frame, one of which is shown in Fig. 3 at 27, these catches having inclined faces to be engaged by the inclined end of the latches. It will be seen from the above that the door will be held at a plurality of points around its edge, and in the present case one of the latches or locking-bolts is provided for each edge of the door, and by reason of this the door will be securely held at all points and will not be liable to spring and cause leakage. The operating mechanism is protected by the depending flange 8, which also serves to stiffen the door.

The main frame of the bucket or dipper is stiffened by a reinforcing-piece 26<sup>x</sup>, and this, it will be noticed in Fig. 3, is riveted or otherwise secured to the inner side of the main frame of the bucket. It has an inwardly-projecting portion 27' extending down to nearly the level of the inner side of the door, and its under side is so formed as to leave a recess 28 between itself and the door when the same is in closed position. In the space thus provided by the overhanging of the reinforcing-piece I arrange a packing 29, consisting of a piece of flexible material secured at 30 to an angle-iron 31, which is fixed to the frame of the bucket, the said flexible packing extending downwardly and inwardly so as to rest on the door when the same is closed. The flexible material is so formed as to present a flat rim 32 for contact with the upper surface of the door, and above this flat rim and between the same of the overhanging part of the reinforcing-piece a free space is left, as shown at 28'. This flexible packing will seal the joint between the bucket and the frame, for it will be seen that any liquid passing between the lower edge of the reinforcing-piece and the upper face of the bucket into the space 28 will by pressing on the flexible packing serve to hold the same down against the bucket-door and make a close and practically water-tight joint. It will be seen from the above that the reinforcing-piece not only serves to strengthen the bucket-frame, but it protects the flexible packing from contact with the sand or other abrading material carried by the bucket, and thus prevents damage thereto. This reinforcing-piece also helps to keep the flexible packing in proper shape and in position to perform its function. It will be seen also that my invention in this regard is distinguished from packing joints in which the packing is under compression between two parts which are forced one toward the other,

for in my invention there is no pounding action of the door on a fixed packing; but instead a loose flexible sheet is provided which will accommodate itself to the open or closed position of the door and is pressed against the door by the liquid material tending to escape.

33 shows a stop to control the projection of the locking-bolts. This may be a stationary nut-screw or the like.

It will be noticed from Fig. 2 that the door is not only pivoted to one of the lateral edges of the bucket-frame, but the axis of its hinge or pivot is at an angle to the handle of the dipper or bucket. This is important in securing an automatic closing of the door, for it will be noticed that as the bucket is lowered the axis of the door instead of assuming a vertical position will assume a position, so to speak, "out of plumb," with the effect that the door will swing forcibly around this inclined axis and will shut with a slam.

I claim as my invention—

1. A bucket or dipper for excavating or mining machines having a door pivotally secured to one of the lateral sides of the frame, substantially as described.

2. In combination with a bucket-frame, a door pivotally secured thereto at one edge and a plurality of latching devices located around the edge of the door, substantially as described.

3. In combination with a bucket, a pivoted door, means for holding the door closed, and means for automatically releasing the door, adapted to strike an abutment located adjacent the point of dumping, substantially as described.

4. In combination with a bucket and its pivoted door, a plurality of latches disposed about the different edges of the door, and means for automatically releasing the said latches simultaneously, said means being adapted to strike an abutment located adjacent the point of dumping, substantially as described.

5. In combination with a bucket, a door therefor, pivoted on one of its lateral edges, a latch for holding the door closed, and means for automatically opening the door, said means being arranged to strike an abutment adjacent the point of dumping, substantially as described.

6. In combination with a bucket-frame, a door pivotally secured thereto, latching mechanism and a depending rib on the door associated with the said latching mechanism, substantially as described.

7. In combination with a bucket-frame, a pivoted door having a depending rib and latching means guided through the said rib.

8. In combination with a bucket-frame, a pivoted door having a depending rib, latching mechanism including parts located in the space inclosed by the said rib.

9. In combination with a bucket-frame and its door, a reinforcing-piece on the inner side of the bucket-frame, substantially as described.



10. In combination with a bucket-frame and its pivoted door, a reinforcing-piece on the inner side of the frame extending nearly to the plane of the upper side of the door.

5 11. In combination with a bucket-frame and its pivoted door, a flexible packing within the frame resting on the door and a protecting-piece for the said flexible packing, substantially as described.

10 12. In combination with a bucket-frame and its pivoted door, a flexible packing within the bucket-frame resting on the door and a protecting-piece for the flexible packing providing a space 28' over the flexible packing, substantially as described.

15 13. In combination with a bucket-frame, a piece on the inner side thereof forming an overhang and providing a space between itself and the plane of the upper face of the door, and a flexible packing within the said space having its free edge to rest on the door, substantially as described.

20 14. A bucket or dipper for excavating or mining machines having a door pivotally secured thereto, a latch for holding the said door closed and means for automatically withdrawing the latch to open the door, said means comprising a rod carried by the bucket and adapted to strike an abutment suitably disposed, substantially as described.

30 15. A bucket or dipper for excavating or mining machines, having a door pivotally secured thereto, a plurality of latches for holding the said door closed and automatic means for withdrawing the said latches simultaneously to open the door, said means comprising a rod carried by the bucket and adapted to strike an abutment suitably disposed, substantially as described.

16. A bucket or dipper for excavating or mining machines having a door pivotally secured thereto, a plurality of latches for holding the door closed, said latches being capable of independent adjustment and means for adjusting the latches as a whole to take up wear, substantially as described.

17. A bucket or dipper for excavating or mining machines, having a door pivotally secured to one of the lateral sides of the frame and a plurality of latches for holding the door closed, substantially as described.

18. A bucket or dipper for excavating or mining machines, having a door pivotally secured to one of the lateral sides of the frame, a plurality of latches disposed at different points around the edge of the door for holding the same closed and means for automatically withdrawing the latches simultaneously, substantially as described.

19. In combination in an excavating or mining machine, a bucket or dipper frame, packing associated with the said frame and a door arranged to serve as a valve with a plurality of latches disposed at different points around the door for holding the same in contact with the packing, substantially as described.

20. In combination, a dipper or bucket frame, and a door pivoted to one of the lateral edges thereof, the axial line of the pivot being at an angle to the central line of the handle of the dipper, substantially as described.

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

ERASTUS S. BENNETT.

Witnesses:

J. R. SCOTT,  
MYRON L. JUSTIN.