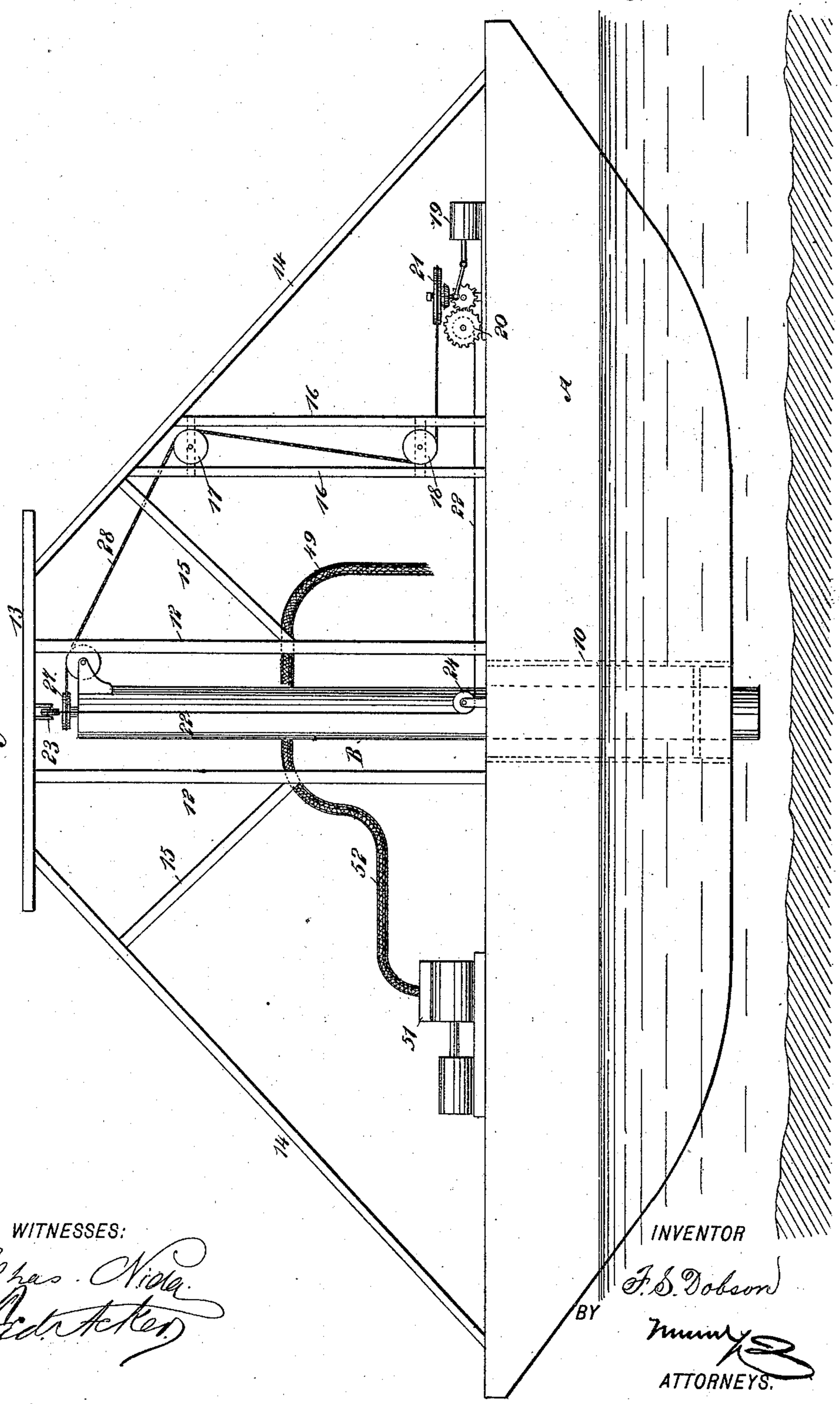
(No Model.) 3 Sheets—Sheet 1.

F. S. DOBSON.

MINING MACHINE.

No. 540,152. Patented May 28, 1895.



WITNESSES:

Chas. Nichols.

J. Richd. Acker.

INVENTOR

F. S. Dobson

BY

Munn & Co

ATTORNEYS.

(No Model.)

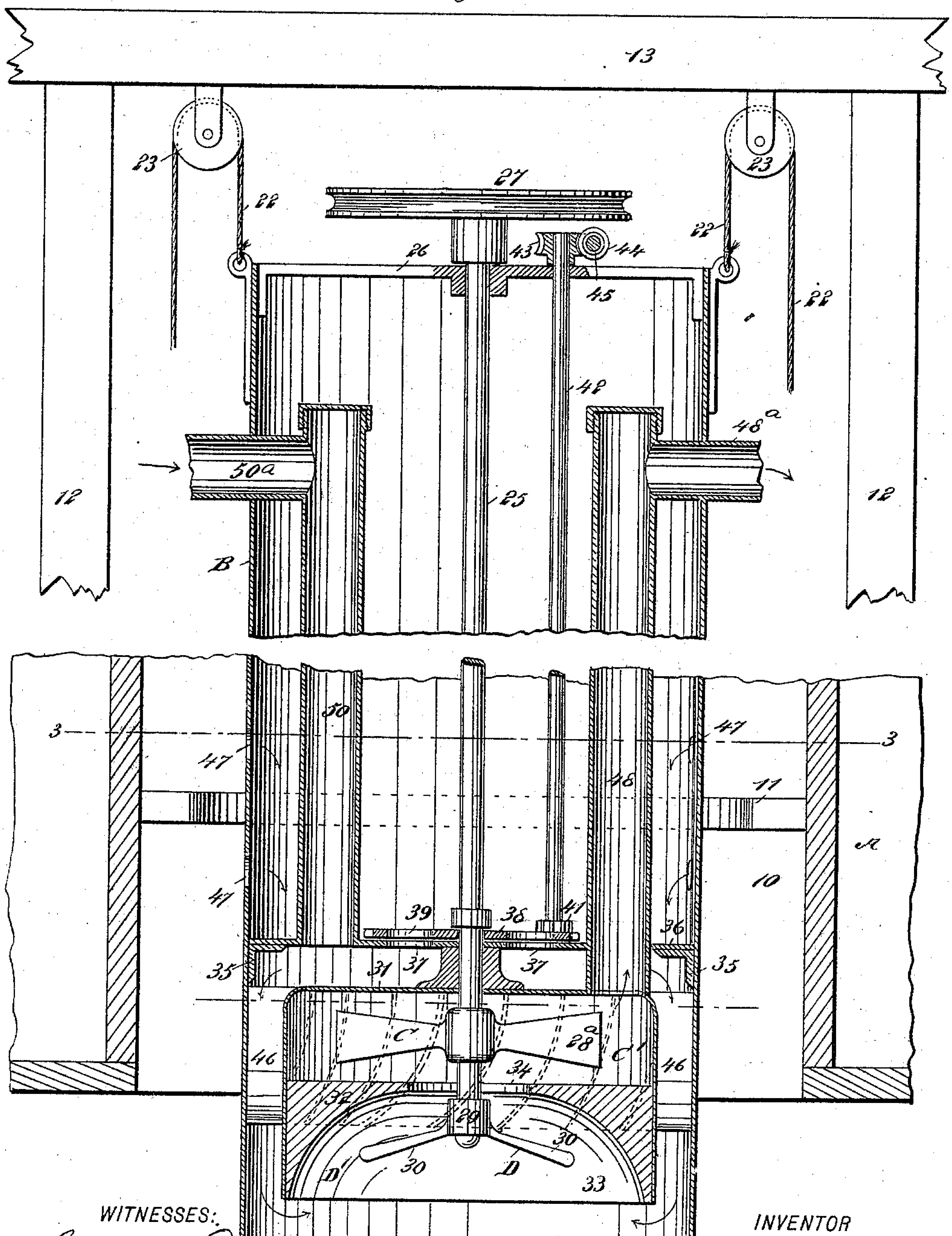
3 Sheets—Sheet 2.

F. S. DOBSON.

MINING MACHINE.

No. 540,152. Patented May 28, 1895.

Fig: 2.



WITNESSES:

Chas. Nida
Fred. Acker.

INVENTOR

F. S. Dobson

BY

Munn & Co

ATTORNEYS.

(No Model.) 3 Sheets—Sheet 3.

F. S. DOBSON.

MINING MACHINE.

No. 540,152. Patented May 28, 1895.

Fig: 3.

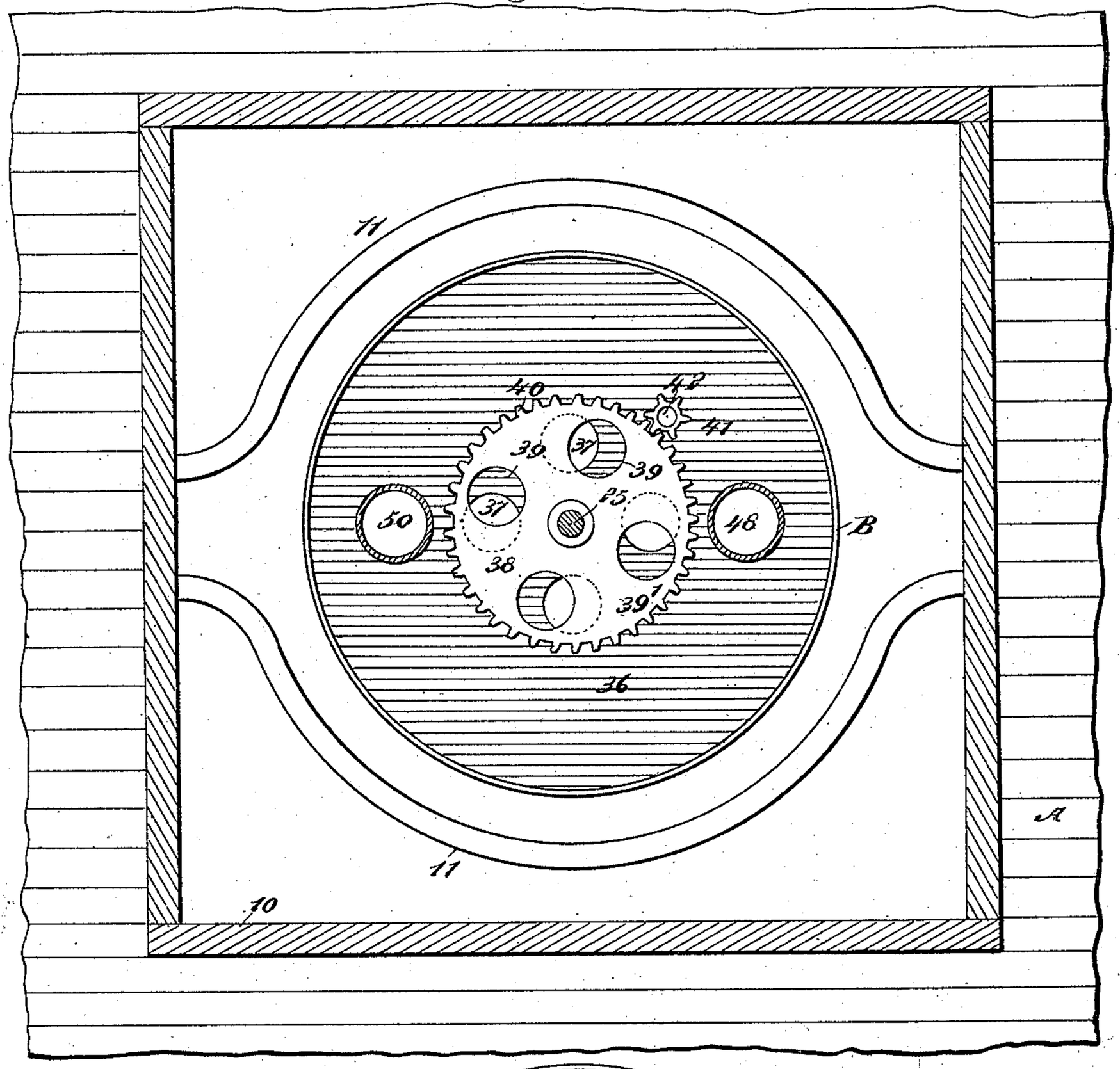
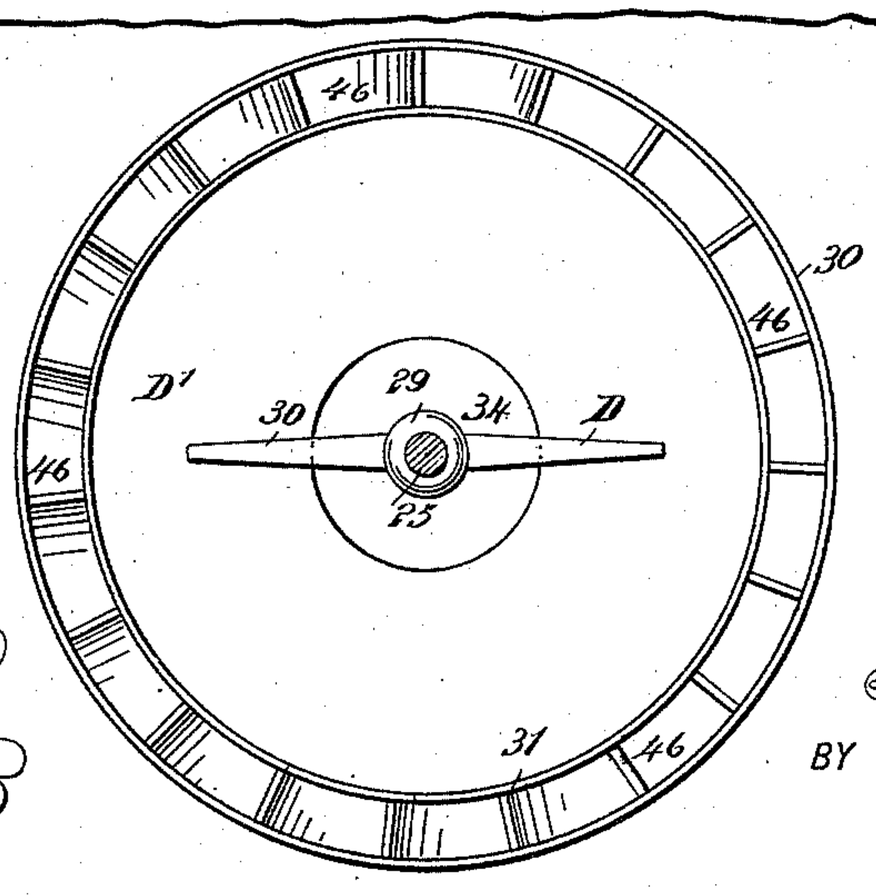


Fig: 4.



WITNESSES:

Chas. Nidy.

J. Fred. Acker.

INVENTOR

F. S. Dobson

BY

ATTORNEYS.

UNITED STATES PATENT OFFICE.

FRANK SCOTT DOBSON, OF VANCOUVER, CANADA, ASSIGNOR OF TWO-THIRDS TO FRANCOIS XAVIER MARTIN AND ALBERT EDWARD BECK, OF SAME PLACE.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 540,152, dated May 28, 1895.

Application filed February 7, 1895. Serial No. 537,630. (No model.) Patented in Canada September 24, 1894, No. 47,089.

To all whom it may concern:

Be it known that I, FRANK SCOTT DOBSON, of the city of Vancouver, Province of British Columbia, and Dominion of Canada, have invented a new and useful Improvement in Mining Machinery, (for which I have obtained Letters Patent in Canada, No. 47,089, dated September 24, 1894,) of which the following is a full, clear, and exact description.

My invention relates to an improvement in mining machinery especially adapted for raising gold from rivers, bars or flats, and the object of the invention is to provide a caisson, a support for the same, and means for raising and lowering the caisson and providing it with a centrifugal pump and agitator, and a means whereby the water from the stream in which the caisson is sunk may be made to force the material to the pump and assist the agitator in removing the material and delivering it to the pump, or whereby, when the receiving end of the caisson is buried too deeply in the bed of the stream to permit the water entering the caisson from assisting the agitator, water may be introduced to the pump and to the agitator under pressure from the support for the caisson.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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

Figure 1 is a side elevation of a scow upon which the mining-machine is mounted. Fig. 2 is a longitudinal central section through the caisson. Fig. 3 is a transverse section through the caisson, taken substantially on the line 3 3 of Fig. 2; and Fig. 4 is a bottom plan view of the caisson and the casing surrounding the pump.

In carrying out the invention a scow A is employed, or equivalent floating support or body, and in the central portion of the scow a well 10 is made, preferably polygonal in cross section, the said well extending through the scow from top to bottom, and within this well two semi-circular and opposing guide rings 11 are pivoted, or otherwise mounted in a manner to render them adjustable to and from one another, the guide rings being adapted to receive between them the lower portion of a caisson B, the said caisson being preferably made of boiler iron with a smooth outside surface, although it may be constructed of any other desired material, or as the character of the work may demand. The upper portion of this caisson is located between standards 12 secured upon the deck of the scow, the said standards being ordinarily connected at the top by means of a cross bar 13, which in its turn is braced by side bars 14 extending downward to the fore-and-aft portions of the scow, the side bars being in their turn strengthened by short braces 15. A second set of standards 16 is located at one side of the central or main set 12, and between this second set of standards pulleys 17 and 18 are mounted, and adjacent to this second set of standards an engine 19 is located usually upon the deck of the scow, having driving connection with a windlass 20 and with a shaft upon which a large horizontal pulley 21 is mounted.

The caisson is raised and lowered by attaching cables 22 to the sides thereof at the top, as shown in Fig. 2, which are passed over pulleys 23, pendent from the cross bar 13, and downward over suitable pulleys 24 located upon or near the deck of the scow, from whence the said cables 22 are carried to the windlass 20.

About centrally within the caisson a shaft 25 of a centrifugal pump C is mounted, the upper end of the shaft being preferably held to turn in a spider 26; and the said pump shaft is provided with a pulley 27 at its upper end and is driven by a belt 28 passed around said pulley, likewise around the pulleys 17 and 18 in the second set of standards 16, and around the driven pulley 21 near the engine.

The centrifugal pump C consists of a series of propeller-like blades 28^a, secured upon the said shaft 25 at or near its lower end, the lower end of the shaft having removably secured thereto an agitator D, which is preferably made to consist of a hub 29 and blades 30 of any desired shape projected radially and downwardly from the hub.

A casing 31 open at its lower end is made to surround both the pump and the agitator, a space being made to intervene the outer face of the casing and the inner surface of the caisson, both the casing and caisson being preferably of the same cross sectional shape, but the pump is held to revolve in a chamber C′ of its own, since a horizontal partition 32 is located in the casing 31 below the pump, provided with a bell mouth or recess 33 upon its under side, as shown in Fig. 2, forming a chamber D′ in which the agitator revolves, and an opening 34 in the central portion of the partition 32 forms a communication between these two chambers C′ and D′. I desire it to be understood that preferably the lower end of the casing 31 is a predetermined distance from the lower edge of the caisson.

Above the casing 31 brackets 35 are secured upon the inner face of the caisson, and on these brackets a horizontal partition 36 is made to rest, and to this partition at its center the casing 31 is secured, while around the central portion of the partition 36 a series of openings or apertures 37 is made, and a disk valve 38 is loosely mounted around the pump shaft 25 and is held to turn upon the upper face of the said partition 36, the valve disk having openings or apertures 39 made therein, as shown in Fig. 3, corresponding preferably in size, order and number to the apertures 37 in the partition. The periphery of the disk valve is provided with teeth 40 engaged by a pinion 41 secured upon a shaft 42, which extends upward to a bearing at the top of the caisson, where the shaft is usually provided with a worm wheel 43 or its equivalent, meshing with a worm 44 located upon a shaft 45 operated by hand or by power. Thus by manipulating the shaft 45 the apertures in the valve may be brought wholly or partially in registry with those in the partition, or the openings in the partition may be entirely closed. The valve may be properly termed a sluice valve, since it is adapted when surface water is used, to admit said water in sufficient quantities through the partition to the agitator and pump.

The space between the partition 36 and the casing 31 constitutes a water-way, and the water is delivered into a series of chutes, flues or channels 46, constructed around the sides of the casing 31 and filling the space between the casing and the caisson; but these flues or channels do not extend the full length of the casing. The channels or flues are placed at such an inclination around the pump casing that they will direct the water at about an angle of ninety degrees to the bell mouth in which the agitator is located, the direction of the water being shown by the arrows in Fig. 2.

Series of openings or apertures 47 are made in the sides of the caisson above the partition 36, and these openings or apertures, when desired, may be closed by suitably constructed covers.

A discharge pipe 48 is located within the caisson, closed at its upper end, and the lower end of this discharge pipe is made to enter the pump chamber C′ at one side, and is provided at its upper end with a branch 48ª, which extends out through the caisson at a point above the level of the deck of the scow, and to this branch pipe preferably a flexible tube 49 is secured, to be conducted to sluice boxes, or equivalent receptacles.

Water is delivered to the pump and agitator under pressure when necessary through the medium of a pipe 50, located also within the caisson, but the said pipe 50 is passed only through the partition 36 and communicates with the water-way above the casing 31 and over the chute or channels 46, as shown in Fig. 2; and this force pipe 50 is provided with a branch 50ª, extending out from the caisson a suitable distance above the deck, being connected with a force pump 51 preferably by a length of flexible tubing 52.

In operation, the caisson having been lowered to the bed of a stream, for example, the water of the stream will have sufficient power upon entering the caisson through the openings 47 to assist the agitator largely in stirring up or loosening the material constituting the bed, and delivering said material to the centrifugal pump C, by means of which it will be forced into and through the delivery pipe 48. If, however, the caisson is so far buried in the bed that the water of the stream will not of itself have sufficient power to loosen particles in the bed of the stream, the sluice valve 38 is completely closed, and the water is forced from the pump 51 through the force pipe 50 downward into the flues 46, from whence it will be delivered upon the bed, and the water, together with the particles removed and likewise the particles stirred up by the agitator when employed, will be delivered to the centrifugal pump and by the pump to the discharge pipe 48. The inclination of the troughs or channels 46 adds to the force of the water when delivered to the bed of the stream, and likewise gives the water a tendency to whirl upward in direction of the centrifugal pump and the agitator. All the interior parts of the said improved caisson may be removed, leaving a clear shaft within which a miner can descend to prospect, or run a drift or a tunnel.

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

1. The combination, with a caisson having openings in its sides, and a partition located below the openings provided with a sluice-valve, and means for raising or lowering the caisson, of a casing supported within the caisson below the partition, a centrifugal pump operating within the casing, and means, substantially as shown and described, for manipulating the sluice valve, and a discharge from the said pump, as and for the purpose specified.

2. In mining machinery, a caisson, means for raising and lowering the same, a casing located within the caisson, a centrifugal pump mounted to revolve in the said casing, a discharge for the said pump leading out from the caisson, and means, substantially as shown and described, for supplying water to the pump, as and for the purpose specified.

3. In mining machinery, a caisson, means for raising and lowering the same, a casing located within the lower portion of the caisson, a centrifugal pump, and an agitator held to revolve in the said casing, a discharge pipe leading from the casing out through the caisson, a force pump, a connection between the said pump and a space within the caisson above the casing, and a partition located within the caisson over the casing, having valve-controlled openings, and means, substantially as shown and described, for admitting water into the caisson above its partition, as and for the purpose set forth.

4. The combination, with a caisson provided with openings in its sides, a partition below said openings provided with a sluice valve, and means, substantially as shown and described, for raising and lowering the caisson, of a casing located within the caisson below the partition, of less diameter than the caisson, inclined troughs filling the space between the sides of the caisson and casing, a partition dividing the casing into two compartments, the under face of the partition being provided with a cavity, a shaft mounted to revolve in the caisson, a centrifugal pump carried by the said shaft and held to revolve in the upper chamber of the casing, and an agitator also mounted upon the said shaft and held to revolve in the cavity of the said partition, the partition being provided with an opening leading up into the pump chamber, and a discharge from the said pump, as and for the purpose specified.

FRANK SCOTT DOBSON.

Witnesses:
J. C. DOCKERILL,
WALTER J. THICKE.