

No. 886,728.

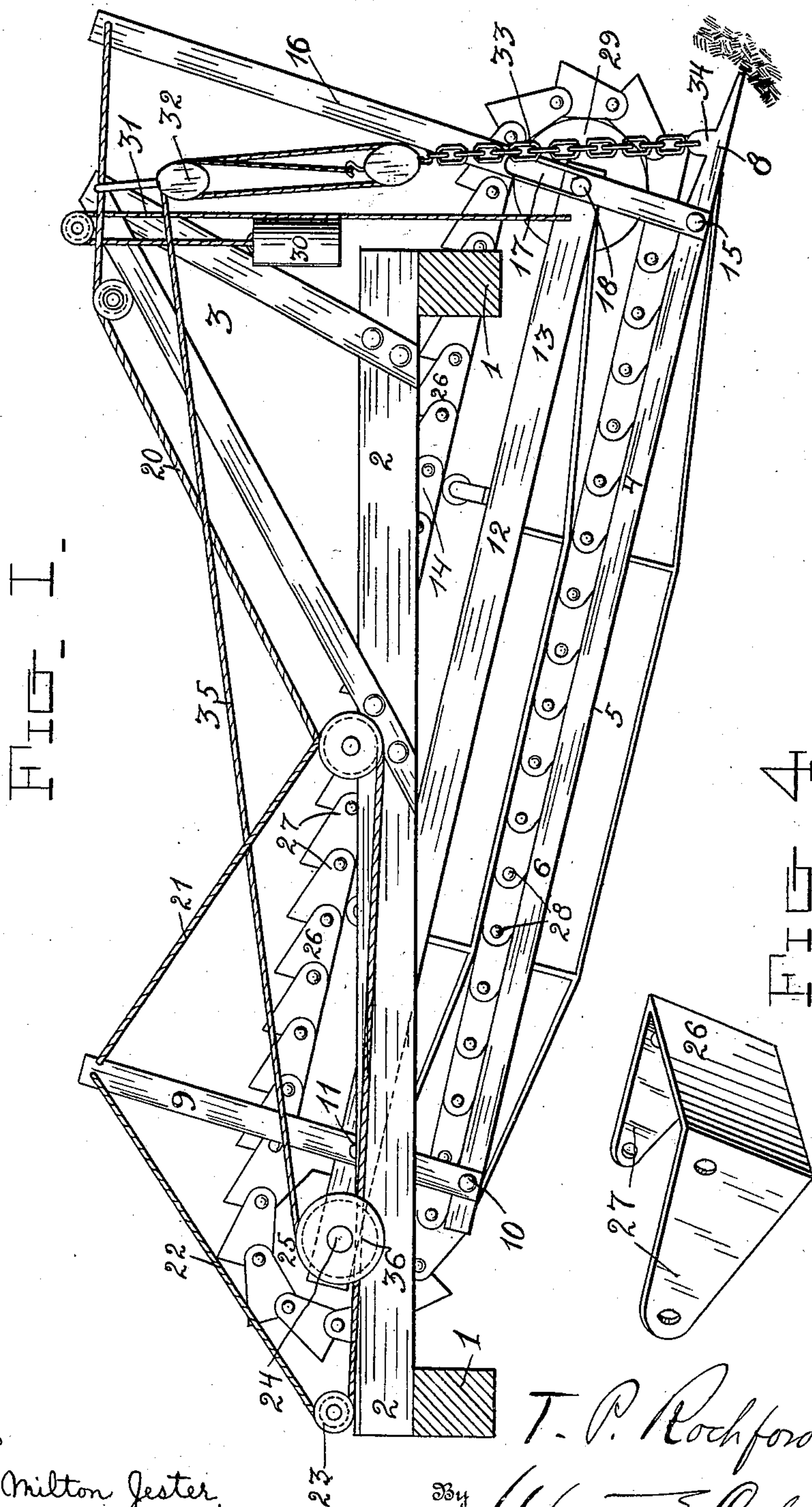
PATENTED MAY 5, 1908.

T. P. ROCHFORD.

MINING DREDGE.

APPLICATION FILED JUNE 29, 1907.

3 SHEETS—SHEET 1.



Witnesses

J. Milton Jester.
D. L. Nash.

T. P. Rochford Inventor

By Watson E. Coleman
Attorney

No. 886,728.

PATENTED MAY 5, 1908.

T. P. ROCHFORD.

MINING DREDGE.

APPLICATION FILED JUNE 29, 1907.

3 SHEETS—SHEET 2.

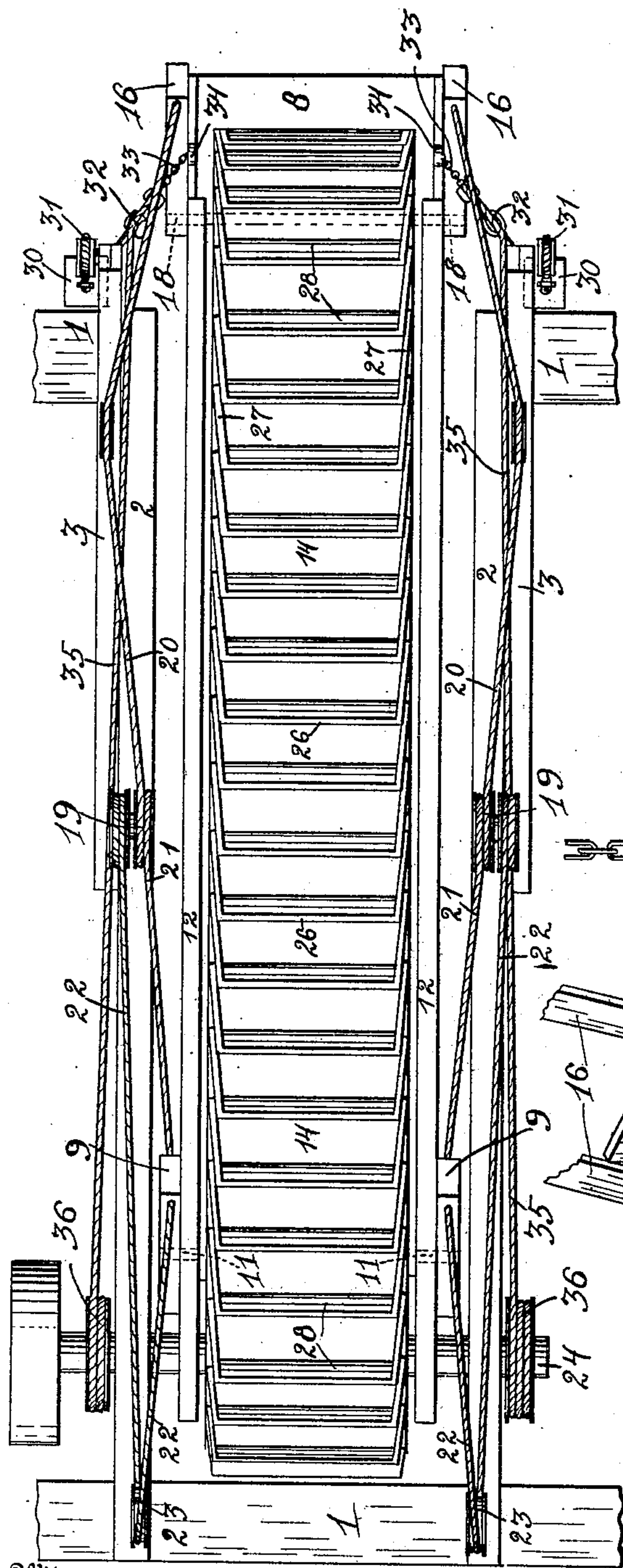
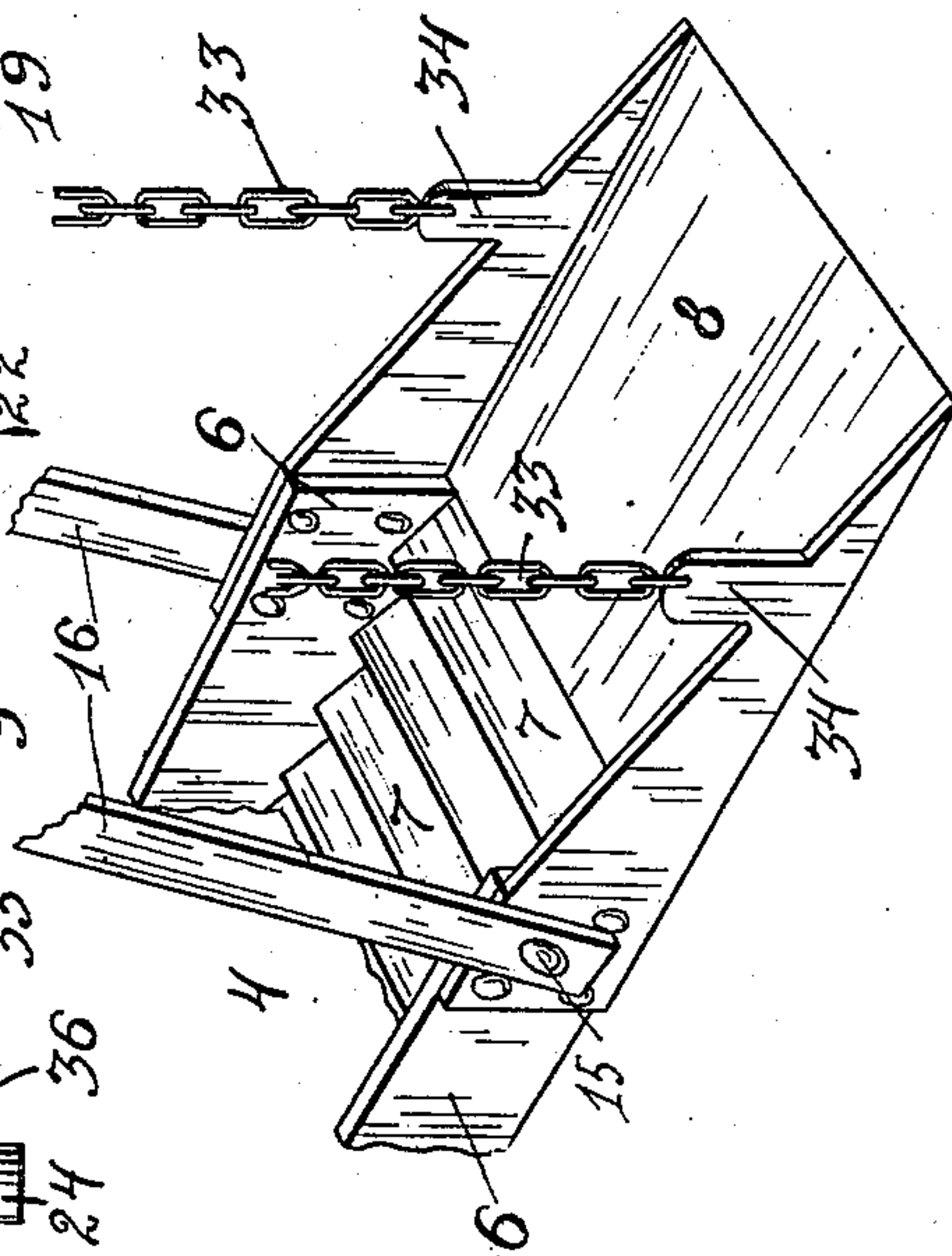


FIG. 1.

FIG. 2.



Witnesses

J. Milton Jester.
D. L. Nash.

334

T. P. Rochford ^{Inventor}
Watson E. Coleman ^{Attorney}

No. 886,728.

T. P. ROCHFORD.
MINING DREDGE.

PATENTED MAY 5, 1908.

APPLICATION FILED JUNE 29, 1907.

3 SHEETS—SHEET 3.

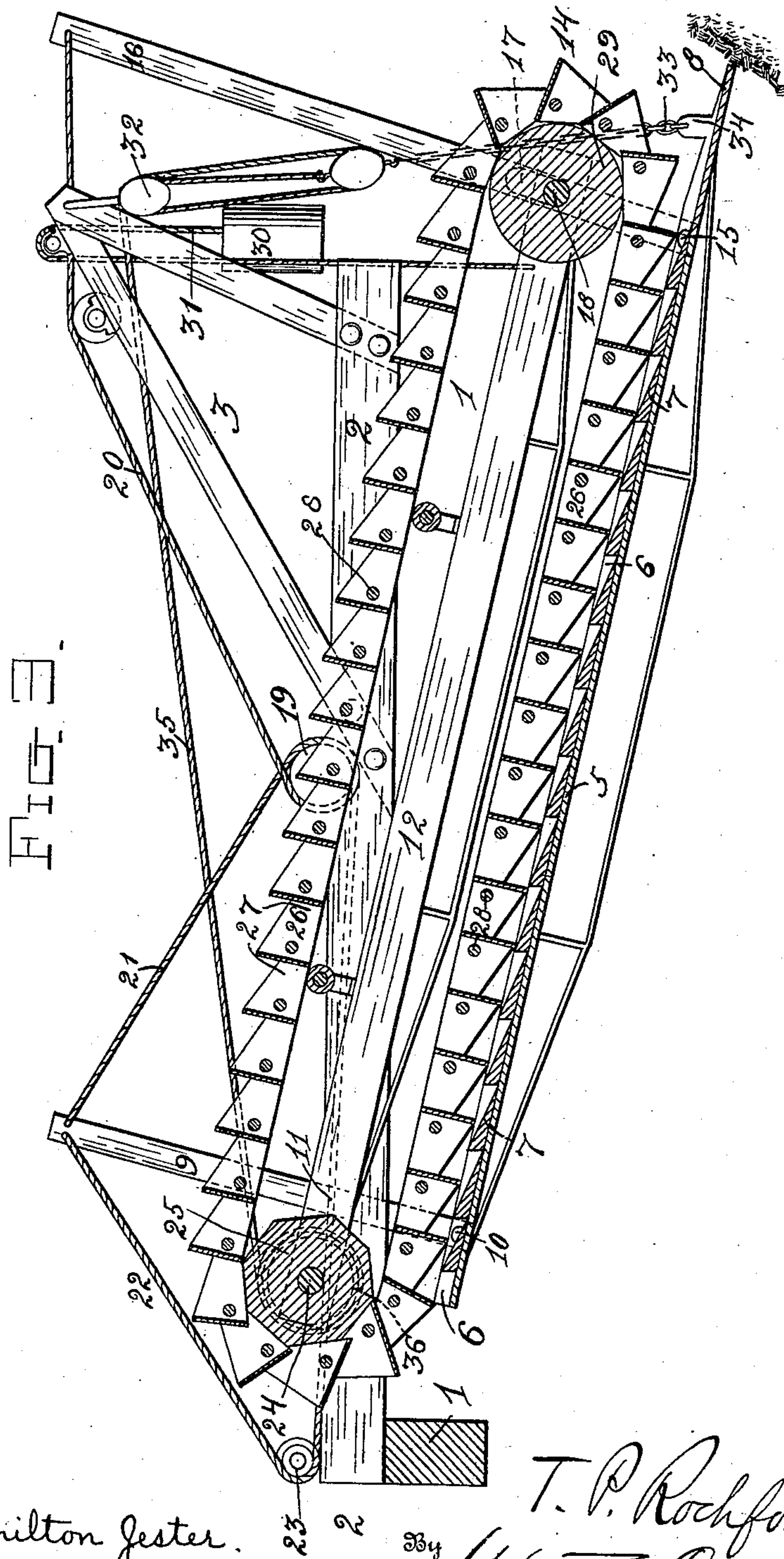


FIG. 3.

Witnesses

J. Milton Jester.
D. L. Nash.

Inventor

T. P. Rochford
Watson E. Coleman
Attorney

UNITED STATES PATENT OFFICE.

THOMAS P. ROCHFORD, OF VALDEZ, DISTRICT OF ALASKA.

MINING-DREDGE.

No. 886,728.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed June 29, 1907. Serial No. 381,448.

To all whom it may concern:

Be it known that I, THOMAS P. ROCHFORD, a citizen of the United States, residing at Valdez, in the District of Alaska, have invented certain new and useful Improvements in Mining-Dredges, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in dredges and in apparatus for saving gold and other minerals.

The principal object of the invention is to provide a dredging apparatus which will wash or save the gold from the gravel or other material as such material is being elevated or brought to the surface by the dredge.

With the above and other objects in view, the invention consists of the novel construction and the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which

Figure 1 is a side elevation of my improved mining dredge, partly in section; Fig. 2 is a top plan view; Fig. 3 is a vertical longitudinal section; Fig. 4 is a detail perspective of one of the scoops or buckets of the endless elevator; and Fig. 5 is a detail perspective of the front end of the combined elevator trough and sluice box, its digging nose or shovel and its attached parts.

My combined dredging and gold saving machine or apparatus comprises a suitable main frame 1 adapted to be built into or suitably mounted upon a scow or other floating body (not illustrated) and as shown in the drawings, comprises a horizontal portion 2 and a vertical portion 3.

Suspended beneath the frame in a downwardly and forwardly inclined position is a combined elevator trough and sluice box 4 consisting of a bottom 5 and upright sides 6. Upon the bottom 5 are suitable transverse riffles 7 which form pockets for the reception of quicksilver and at the front and lower end of the trough or box is a metallic nose 8 adapted to serve as a digging shovel. The box 4 is suspended for oscillatory movement in a longitudinal direction, that is forwardly and rearwardly, and its front end is adapted to be raised and lowered so that its nose or shovel 8 may be adjusted for operation upon the bed of a stream or body of water in which the apparatus is located. This mounting of the box is effected by providing at its rear end two upright levers 9 which have

their lower ends pivoted at 10 upon the sides 6 of the box at its upper or rear end and their intermediate portions pivoted or fulcrumed at 11 upon the side bars 12 of a vertically swinging frame 13 which carries an endless elevator 14 adapted to work through the trough or box 4 and to carry the gravel or other material dug up or loosened by the shovel 8 upwardly through said box. The upper ends of the levers 9 project above the top of the frame 1 and are operated as hereinafter described or in any other suitable manner for the purpose of oscillating or swinging the box 4. Pivoted at 15 upon the sides 6 adjacent to the front end of the box 4 are two upwardly extending levers 16 which are loosely fulcrumed intermediate their ends upon the forward ends of the side bars or beams 12 by forming in them longitudinal slots 17 to receive the projecting ends of a transverse shaft 18. The levers 16 serve both as a suspending and operating means for the front of the box 4 and their projecting upper ends may be oscillated in any suitable manner.

For the purpose of operating the levers 9, 16 and thereby swinging or oscillating the box 4 to cause its nose or shovel 8 to enter the bed of the material which the apparatus is operating upon, I preferably, but not necessarily, employ a plurality of winding drums 19 adapted to be operated by an engine or other motor. Three cables 20, 21, 22 are operated by the drums 19, the cable 20 leading to the upper ends of the levers 16, the cable 21 leading directly to the ends of the levers 9 and the cable 22 being passed over a guide sheave or the like 23 arranged in rear of the levers 9 and then attached to the latter, as clearly shown in the drawings. While the foregoing is the preferred arrangement of the cables, it will be understood that any other arrangement may be provided for oscillating the levers.

The elevator carrying frame 13 is inclined downwardly and forwardly and has its rear end pivotally hung from a transverse shaft 24 suitably journaled upon the main frame. The shaft 24 may be connected to and driven by an engine or motor of any description and upon its central portion is a driving wheel or drum 25 for the endless elevator 14. This wheel has its periphery provided with flat faces to engage the buckets or scoops of which the elevator is composed and prevent the latter from slipping upon it. While the

elevator may be of any suitable form and construction I preferably make it of a plurality of buckets or scoops 26 which are of substantially U-form, as clearly shown in Fig. 4, so that they are open at both the top and bottom. The tapered arms 27 of these buckets overlap the closed ends of the next adjacent ones and are pivotally connected thereto by cross rods 28. By constructing the buckets in this manner it will be seen that they will serve as scoops to scrape or drag the material dug or loosened by the shovel 8 upwardly through the box 4 and over the riffles 7 upon its bottom. The elevator passes over a guide wheel or drum 29 arranged upon the transverse shaft 18 at the front end of the frame 13. Owing to the sliding engagement of the ends of the shaft 18 with the slotted portions of the levers 16, it will be seen that the front end of the elevator will have a limited vertical movement above the box 4 and that its bottom stretch will drag over the top of the box and will also yield or raise vertically when it meets with an obstruction. But I preferably counter balance said end of the elevator and its frame 13 by means of a weight 30 attached to one end of a cable 31 passed over a suitable guide sheave upon the vertical portion 3 of the main frame and having its other end suitably connected to the front of the frame 13.

While the front and lower end of the box 4 may be raised and lowered by any suitable means, I preferably provide upon each side of the device a block and tackle 32 which has its lower block connected by a chain or the like 33 to an ear 34 formed upon one side of the nose or shovel 8 and its upper block suitably connected to the upright portion 3 of the main frame. The ends of the cables 35 which pass over the sheaves in the blocks of said tackle are connected to a drum or drums 36 which may be arranged upon the shaft 24 or otherwise located within convenient reach of an operator.

The invention may be used in various ways but it is especially adapted for, first, digging virgin gravel from the beds of rivers or other bodies of water and washing the gold therefrom during the process of digging; and second, for washing gold from loose gravel which in northern countries is dug up from beneath the frozen surface of the ground during the winter months and deposited in dumps or piles for treatment in sluice boxes during the summer months. In use, the main frame is suitably mounted upon a scow or float, as before stated, and the cables 35 are then adjusted to position the shovel or nose 8 at the proper elevation. The shaft 24 is then driven to impart motion to the elevator and while the latter is in motion the drums 19 are operated to cause the cables 20, 21 22 to oscillate the levers 9, 16 and thereby

oscillate the trough or box 4 so that its shovel or nose 8 will dig into the bed of gravel or other material. As this material is dragged upwardly through the box by the buckets or scoops of the bottom stretch of the elevator, it will be thoroughly washed by the water through which it passes and the gold which it contains will be deposited upon the bottom of the box and caught by the mercury in the riffles upon said bottom. The tailings are discharged from the upper end of the box 4 into a suitable conveyer (not illustrated) which carries them out of the way, it being understood that the upper end of the box is disposed above the surface of the water.

While I have shown and described in detail the preferred embodiment of my invention it will be understood that I do not wish to be limited to the precise showing herein set forth and that various changes may be resorted to within the scope of the appended claims.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. In a mining dredge, the combination of an inclined sluice box provided with an open top, gold collecting riffles upon the bottom of the box, a digging shovel at the front end of the box, means for supporting the box with its front end submerged in a body of water, means for oscillating the box longitudinally to cause its shovel to loosen the gravel and an endless rotary elevator arranged in the top of the box for elevating the gravel loosened by the shovel.

2. In a mining dredge, the combination of an inclined sluice box provided with an open top, gold collecting riffles upon the bottom of the box, a digging shovel at the front end of the box, means for adjustably supporting the box with its front end submerged in a body of water, means for oscillating the box longitudinally to cause its shovel to loosen the gravel, an endless rotary elevator arranged in the upper portion of the box and having its lower stretch traveling upwardly through the same, and means for yieldably mounting said elevator to permit it to rise and fall with respect to said box.

3. In a mining dredge, the combination of an inclined sluice box provided with an open top, gold collecting riffles upon the bottom of the box, a digging shovel at the front end of the box, means for adjustably supporting the box with its front end submerged in a body of water, means for oscillating the box longitudinally to cause its shovel to loosen the gravel, a counterbalanced frame arranged above the box and pivotally mounted for swinging movement and an endless rotary elevator mounted upon said frame and having its lower stretch traveling upwardly through the box to elevate the gravel.

4. In a mining dredge, the combination of an inclined sluice box provided with an open top, gold collecting riffles upon the bottom of the box, a digging shovel at the front end of the box, a support from which the rear end of the box is pivotally hung, means for adjusting the front end of the box vertically, means for oscillating the box longitudinally to cause its shovel to loosen the gravel, a frame arranged above the box and pivoted at its rear end, means for counterbalancing the front end of said frame and an endless rotary elevator mounted on said frame and consisting of a chain of buckets or scoops, the lower stretch of the elevator chain being adapted to travel upwardly through the box to elevate the gravel therein.

5. In a mining dredge, the combination of an inclined sluice box provided with an open top, gold collecting riffles upon the bottom of the box, a digging shovel at the front end of the box, a support from which the rear end of the box is hung for swinging movement, means for adjusting the front end of the box vertically, a frame pivoted at its rear for vertical swinging movement, an endless rotary elevator upon said frame and having its lower stretch adapted to travel upwardly through the box, a pivot upon said frame, and an operating lever pivotally and slidably engaged with said pivot and having its lower end connected to the front portion of said box.

6. In a mining dredge, the combination of an inclined sluice box having an open top, transverse riffles upon the bottom of the box, a digging shovel at the front end of the box, means for supporting the box with its front end submerging in a body of water, means for oscillating the box longitudinally and an endless rotary elevator mounted above the box and consisting of an endless chain of U-shaped buckets or scoops pivotally connected to each other by cross rods, the lower stretch of the elevator chain being adapted to travel upwardly through the box and over its transverse riffles.

7. In a mining dredge, the combination of a support, a transverse drive shaft thereon, a driving drum on said shaft, a sluice box having its rear end hung from said support for longitudinal swinging movement, gold saving riffles upon the bottom of the box, a digging shovel at the front end of the box, means for adjustably supporting the front end of the box, a counterbalanced swinging frame having its rear end hung from said

shaft, a transverse shaft in the front end of said frame, a drum upon the last mentioned shaft, an endless chain of buckets passed around the two drums and adapted to have its lower stretch travel upwardly through the box, and an operating lever slidably and pivotally engaged with the shaft at the front end of said frame and having its lower end connected to the front portion of said box.

8. In a mining dredge, the combination of a support, an inclined sluice box having its rear end hung from said support for swinging movement and provided upon its bottom with gold saving riffles and upon its front end with a digging shovel, means for adjustably supporting the front end of the box, a counterbalanced frame arranged above the box, an endless chain of buckets or scoops upon said frame adapted to have its lower stretch travel upwardly through the box and means for oscillating said box longitudinally.

9. In a mining dredge, the combination of a support, a combined elevator trough and sluice box having its rear end pivotally hung from said support, a digging shovel upon the front end of the combined elevator trough and sluice box, gold saving riffles upon the bottom of said combined elevator trough and sluice box, means for raising and lowering the front end of said combined elevator trough and sluice box, a swinging frame on said support, an endless elevator on said frame, and means for oscillating said combined elevator trough and sluice box.

10. In a mining dredge, the combination of a support, a combined elevator trough and sluice box having a digging shovel at its forward end, and gold saving riffles upon its bottom, a swinging frame pivoted at one end upon said support, means for counterbalancing the free end of said frame, an endless elevator upon said frame, a front lever loosely pivoted upon the free end of said frame for supporting and operating said combined elevator trough and sluice box, a rear lever pivoted upon said support for supporting and operating the rear end of said combined elevator trough and sluice box, means for operating said levers and means for adjusting the front end of said combined elevator trough and sluice box.

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

THOMAS P. ROCHFORD.

Witnesses:

JNO. Y. OSTRANDER.

A. W. ROCHFORD.