

No. 692,030.

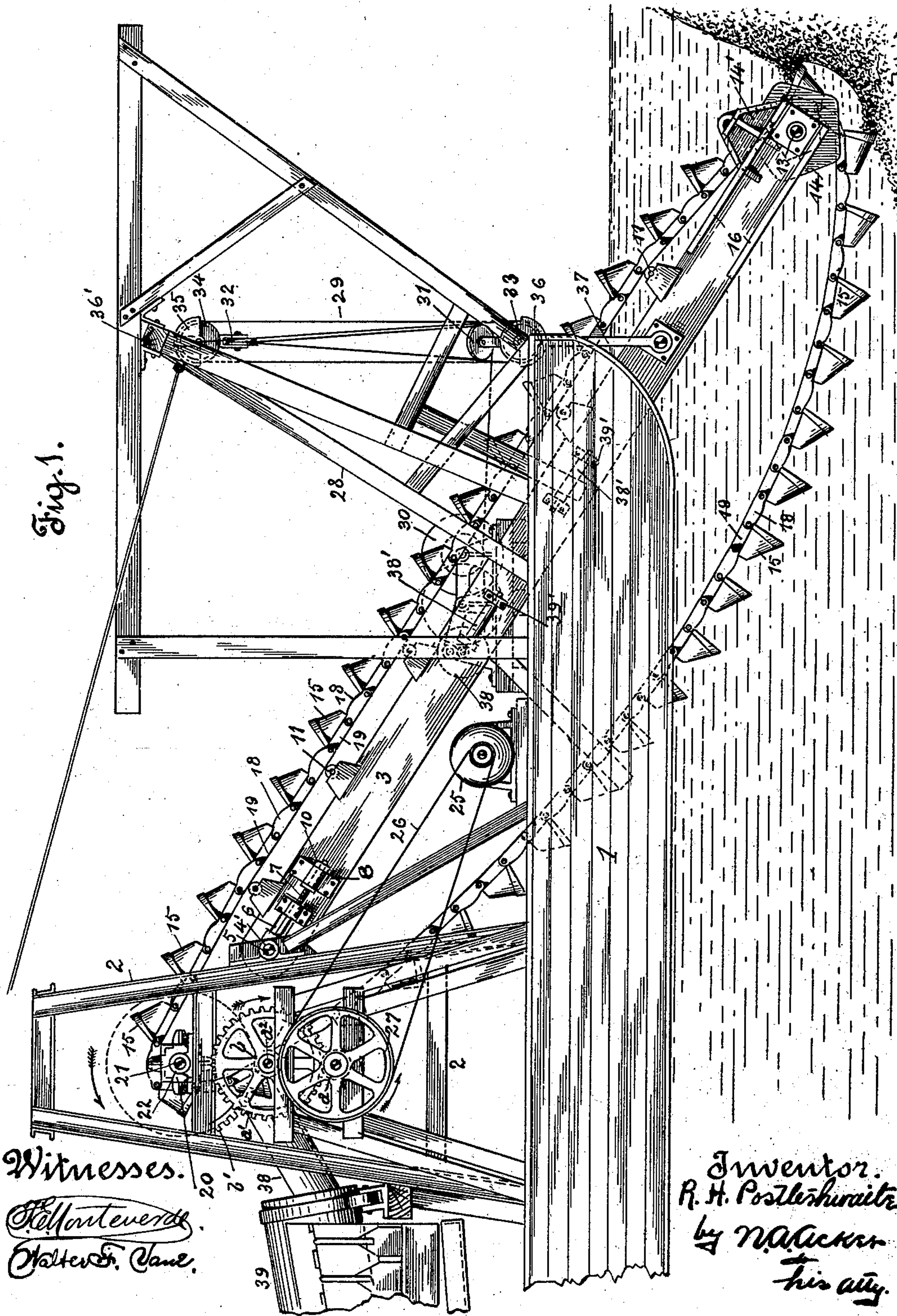
Patented Jan. 28, 1902.

R. H. POSTLETHWAITE.
EXCAVATING MECHANISM FOR DREDGERS.

(Application filed Mar. 18, 1901.)

(No Model.)

3 Sheets—Sheet I.



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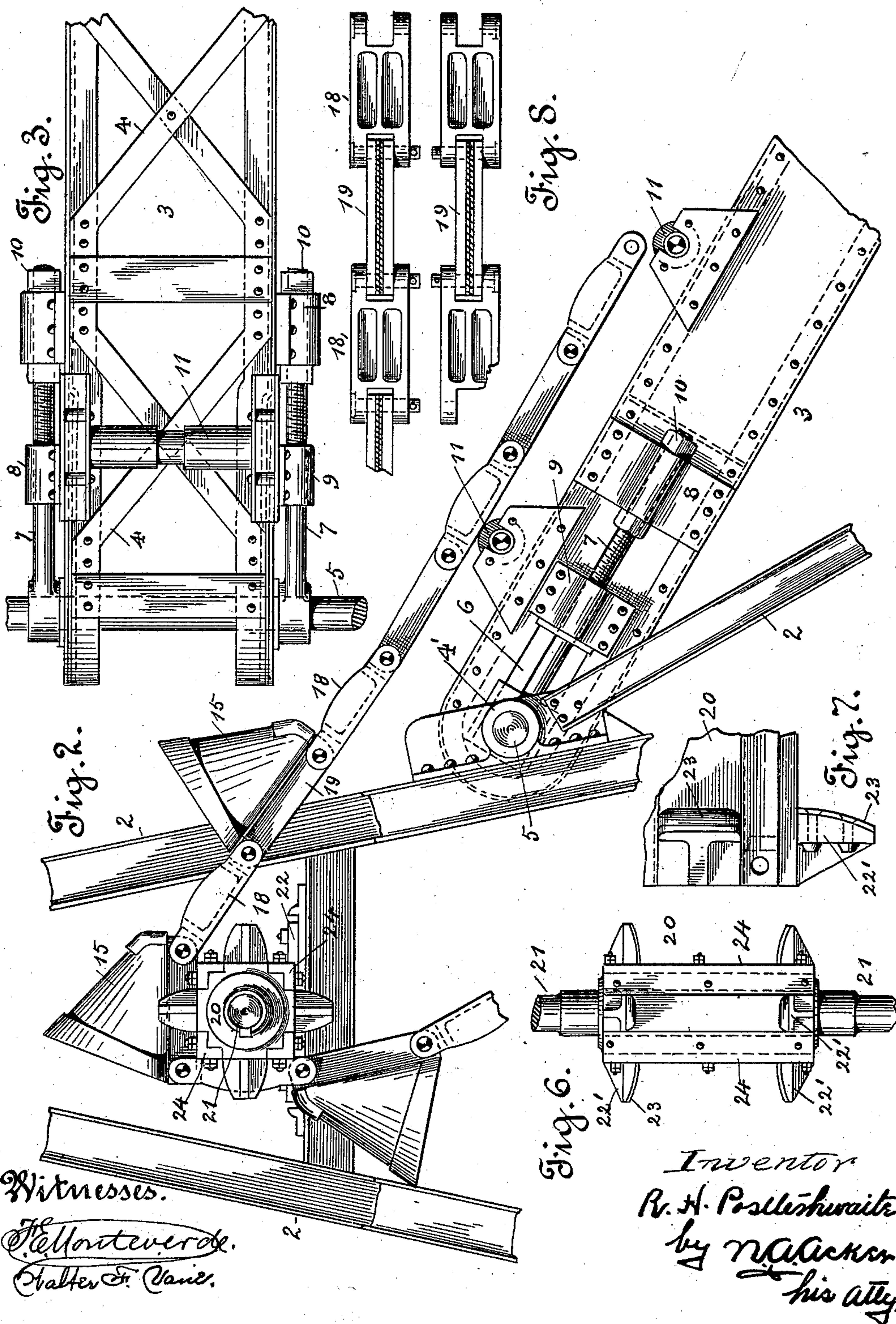
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

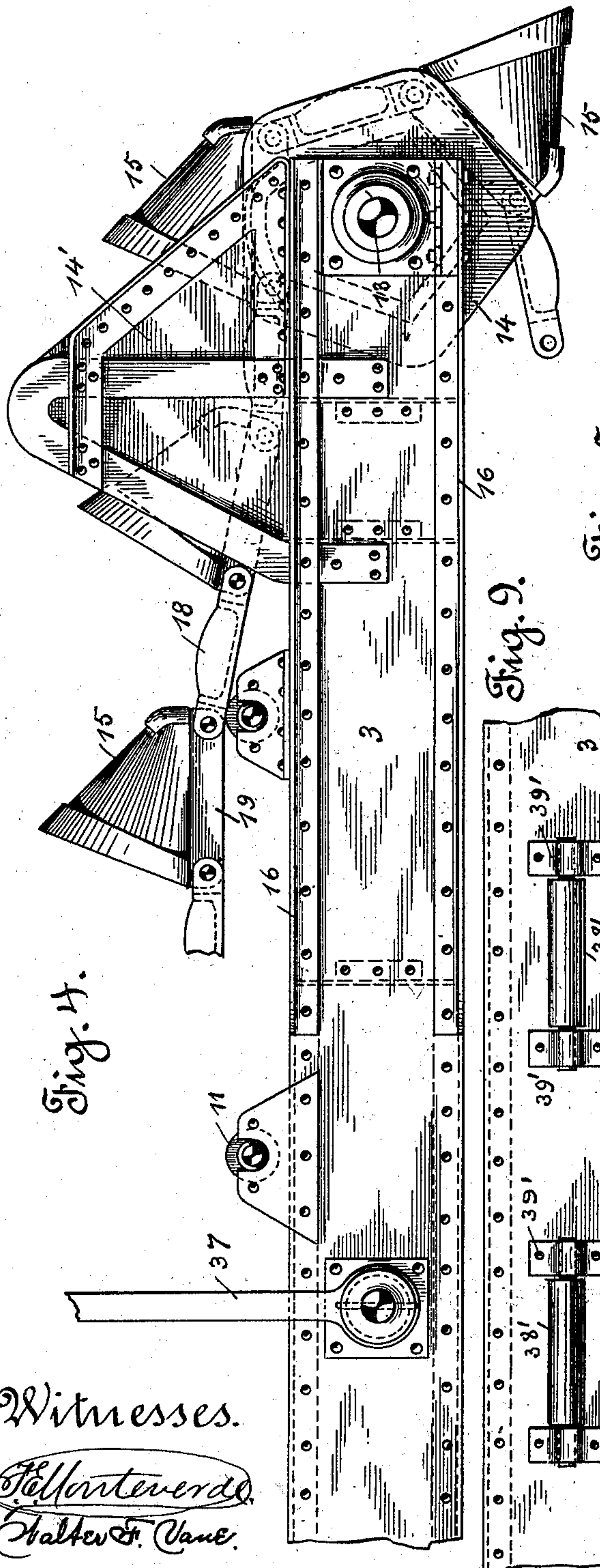


Fig. 9.

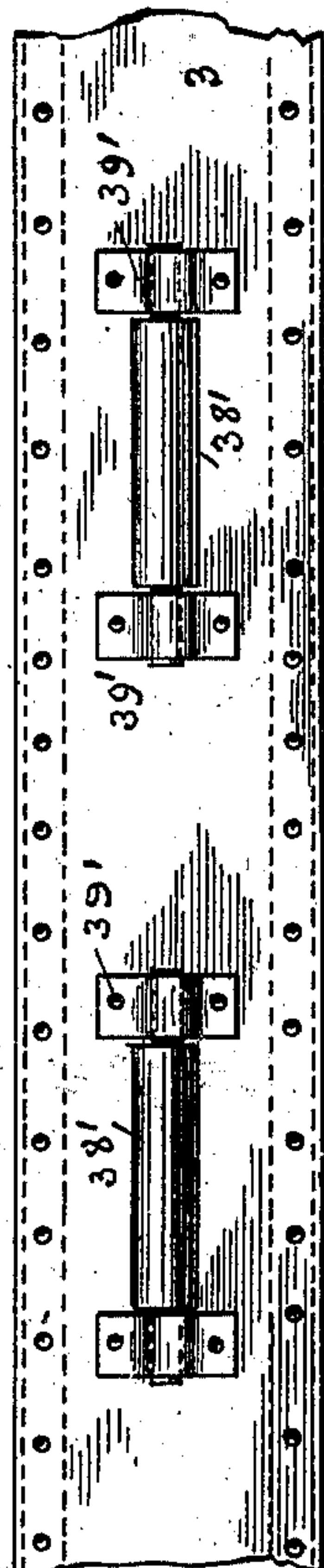
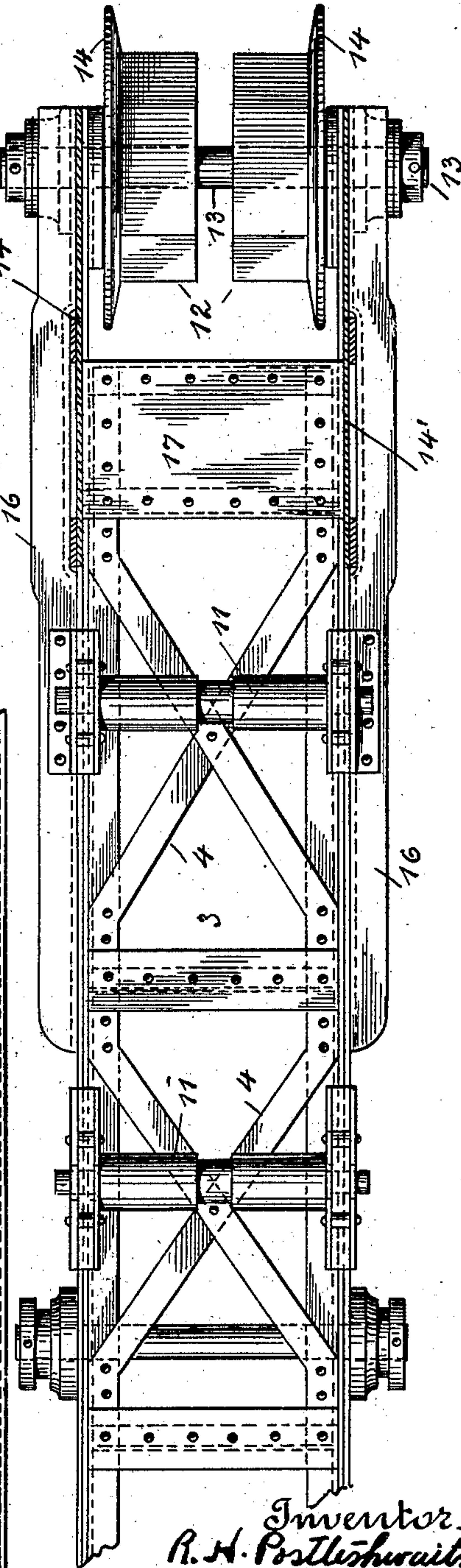


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

ROBERT H. POSTLETHWAITE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR
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EXCAVATING MECHANISM FOR DREDGERS.

SPECIFICATION forming part of Letters Patent No. 692,030, dated January 28, 1902.

Application filed March 18, 1901. Serial No. 51,646. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. POSTLETHWAITE, a subject of the King of Great Britain, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Excavating Mechanism for Dredgers; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention is designed for use in connection with that class of dredgers employed for use in excavation of gold-bearing soil from river-bottoms, and it relates more particularly to certain improvements in the swinging ladder over which the endless carrier for the cutting-buckets work.

The objects of the invention are to provide for renewal of the wearing-face of the tumbler at the upper end of the swinging ladder, in providing means whereby frictional wear of the ladder due to lateral strain of the ladder against the side walls of the well during the working of the apparatus may be obviated, and to provide against the endless carrier moving laterally as carried over the rolls or drum at the lower or submerged end of the ladder.

In order to comprehend the invention, reference should be had to the accompanying sheets of drawings, wherein—

Figure 1 is a side view in elevation, partly broken away, of the dredge, illustrating the position of the excavating mechanism during the operation of cutting into an embankment.

Fig. 2 is a broken detail view in side elevation disclosing a portion of the ladder and endless carrier to which the excavating-buckets are attached, the upper tumbler over which the endless carrier travels, and the means for regulating longitudinal adjustment of the ladder.

Fig. 3 is a broken plan view of the ladder detached from its supporting-frame. Fig. 4 is a side view in elevation of the lower end portion of the ladder, showing a portion of the endless carrier with excavating-buckets attached thereto.

Fig. 5 is a plan view of that portion of the ladder illustrated in Fig. 4. Fig. 6 is a plan view of the tumbler over which the endless carrier travels.

Fig. 7 is a broken detail view of the same; Fig. 8, a broken plan view of the endless carrier, and Fig. 9 is a broken side view of the ladder.

In the drawings the numeral 1 is used to indicate the dredge-boat, which is provided with the usual well within which the swinging ladder works. To the said boat is secured the supporting-frame 2, to which is pivoted the ladder 3. The ladder consists of the side pieces suitably strengthened by tie rods or plates 4. In the present case the ladder is held within bearing-boxes 4', attached to the frame 2 by means of the shaft 5. This shaft extends through slots 6, formed in the upper portion of the ladder, and to each end of said shaft is secured an adjusting-rod 7. These rods extend through guide-plates 8 9, attached to the sides of the ladder, and the lower end of each rod is screw-threaded and has secured thereon the nuts 10. To the upper face of the ladder are attached the bearing-rolls 11, which support the upper run of the endless carrier. The lower end of the ladder carries the rolls or drums 12, which are mounted upon the shaft 13, extending through the side pieces of the ladder. Each roll or drum is provided with a side flange 14, between which side flanges the chains constituting the endless carrier work. The intent of these side flanges is to keep the carrier from lateral movement; but practical working has demonstrated that such is not the case. Inasmuch as the lower end of the ladder is at all times submerged during working of the dredge, it is required that means be provided to prevent lateral movement of the carrier as carried over the rolls or drums 12, else the said carrier, with its filled buckets, will jam at such point and either slip off of the ladder or seriously strain the same. To obviate this defect, there is attached to each side piece of the ladder a guard-plate 14'. Each guard-plate is of a height sufficient to extend above the bucket 15 as carried over the end rolls or drums 12. Should the endless carrier tend toward lateral movement as carried over said rolls or drums, the side wall of the bucket will bear against the inner face of the guard-plate at such side of the ladder and the carrier gradually force over into proper position. To resist the severe strain to which the ladder is subjected at such point by reason of such lateral movement of the carrier and buckets, due mainly to foreign substances—such as trees, weeds, logs, &c.—being drawn in by

the carrier, the ladder is reinforced by the longitudinal pieces 16 and cross-plate 17.

The endless carrier is composed of chains consisting of links 18, united by plates 19. To the plates 19 are attached the excavating-buckets 15, thus leaving a pair of links between each bucket. Said endless carrier works over lower roll or drum 12 of the ladder and tumbler 20. The shaft or trunnions 21 of said tumbler works in bearings 22, secured to cross-pieces of supporting-frame 2, Fig. 1 of the drawings. From this tumbler at each end project the fingers 22', preferably four at each end. Between these fingers work the endless carrier as carried over the tumbler, and said fingers serve to prevent the endless carrier slipping laterally upon the said tumbler during upward travel thereof with its loaded buckets. Inasmuch as considerable wear falls upon the inner face of said fingers, I line each with a removable steel face-plate 23, which may be readily removed when worn out and replaced by a new one. In this manner the life of the tumbler is considerably prolonged. For the same reason each corner of the tumbler is provided with a removable corner-plate 24, preferably of angle metal, which when worn by the endless carrier may be quickly removed and replaced by a new one.

The tumbler 20 is driven from motor 25 by belt 26, working over pulley 27. The shaft of this pulley carries a pinion a , which meshes with gear a' , secured to shaft a^2 , located above that of shaft carrying the pulley 27. Said shaft a^2 carries a pinion b , which meshes with gear b' , secured to end of tumbler-shaft projecting beyond the bearing-box.

To the boat or platform 1 there is secured, so as to span the well, a frame 28, from which is suspended the swinging ladder 3. This ladder is raised and lowered by means of the cable 29, which leads from the drum 30. The cable is run under sheave 31, thence over sheave 32, thence under sheave 33, thence over sheave 34, and the free end is attached to sheave-frame 35. This frame supports sheaves 32 and 34, while sheaves 31 and 33 are held within frame 36, frame 35 being suspended from cross-piece 36' of frame 28. To sheave-frame 36 is attached the bail 37, the arms of which are pivoted to side pieces of the ladder 3, Figs. 1 and 4. The drum 30 is driven from motor 38, located upon the boat or platform. By this manner of suspending the swinging ladder very little power is required to raise and lower the same.

As the excavated material is discharged from the buckets during their travel over the tumbler 20 the same falls into chute 38 and is delivered by said chute to the interior of the rotary grizzly or separator 39.

During the working of the apparatus there is considerable side or lateral strain placed upon the ladder, and as a consequence the same works or rubs against the inner face of the wall of the well. In order to provide

against frictional wear, it has been customary to provide fenders or plates to protect the ladder and well. However, such guard-plates only serve to partially remedy the difficulty. In order to obviate this difficulty, I secure to each side piece of the ladder one or more rolls 38'. These rolls work in bearing 39', attached to the side piece of the ladder, Figs. 1 and 9. By the employment of these rolls the excessive frictional wear heretofore occasioned by the ladder working against the wall of the well is removed and the life of the parts thus prolonged.

Having thus described the invention, what is claimed as new, and desired to be protected by Letters Patent, is—

1. A tumbler of substantially the character described having a series of reinforced fingers projecting radially from the respective ends thereof.

2. A tumbler of substantially the character described having a series of radially-projecting fingers at the respective ends thereof, and removable face-plates for said fingers.

3. In a dredge for the described purpose, the combination with the fixed supporting-frame, of the ladder pivoted directly thereto, the tumbler working within the supporting-frame, means for imparting rotation to said tumbler, the roll or drum working in bearings at the lower end of the ladder, the endless carrier working over said roll or drum and tumbler, excavating-buckets secured to and carried by the endless carrier, the reinforced guard-plates rigidly secured to the lower end of the side pieces of the ladder, and means whereby the ladder may be raised and lowered.

4. The combination with the ladder for the endless carrier, of the fixed supporting-frame to which the ladder is directly pivoted, means whereby the ladder is raised and lowered, and reinforced independent guard-plates secured to and projecting upwardly from the side pieces of lower end of the ladder, said guard-plates serving to provide against lateral movement of the endless carrier as carried over the drum or roll working within the lower end of the ladder.

5. The combination with the supporting-frame, of the tumbler working in bearings therein, a ladder, a roll or drum working within the lower end of said ladder, means for raising and lowering the ladder, a carrier working over said roll or drum and the tumbler, and means for adjusting the tension of the carrier comprising rods 7 pivoted to the supporting-frame, and devices for adjustably connecting said rods to the ladder, substantially as described.

6. The combination with the supporting-frame, of the ladder pivoted thereto, the tumbler working in bearings of the supporting-frame, means for driving the tumbler, the endless carrier working over said tumbler and a roll or drum working in bearings at the lower end of the ladder, and a series of fingers projecting from the tumbler and between

which the endless carrier works as carried over the tumbler, each finger being provided with a removable wearing or face plate.

7. The combination with the tumbler, of the corner-plates removably attached thereto, a series of fingers projecting from the said tumblers, and a removable wearing or face plate secured to each projecting finger.

8. The combination with the supporting-frame, of the ladder pivoted thereto, the tumbler working within bearings of the supporting-frame, means for imparting rotation to the tumbler, the roll or drum working in bearings at the lower end of the ladder, the endless carrier working over the roll or drum and tumbler, the excavating-buckets secured to and carried by the endless carrier, a series of fingers projecting from the tumbler and between which the endless carrier works, of devices for imparting longitudinal movement to the supporting-ladder so as to regulate the tension of the endless carrier, the guard-plates attached to the lower end of the side pieces of the ladder, and means whereby the supporting-ladder is raised and lowered.

9. A ladder of the character described having the oppositely-arranged guard-plates 14' provided with the braces 16 disposed longitudinally of the ladder.

10. A ladder of the character described having the oppositely-arranged guard-plates 14' provided with the braces 16 disposed longi-

tudinally of the ladder and the brace 17 disposed crosswise thereof.

11. A ladder of the character described having adjacent its lower end relatively short upwardly-extending wear-plates arranged at opposite points on the ladder, and means exterior to said plates for reinforcing the same, substantially as described.

12. In a machine of the character described, a support, a ladder, a drum at the outer end of the ladder, a tumbler on the support, a carrier working over said drum and tumbler, and an adjustable pivotal connection between the support and ladder located at a point intermediate of the drum and tumbler, substantially as described.

13. In a machine of the character described, a support, a ladder, a drum at the outer end of the ladder, a tumbler on the support, a carrier working over said drum and tumbler, a connection between the carrier and support located at a point away from the tumbler intermediate of the same and the drum, and means for longitudinally adjusting said ladder, substantially as described.

In witness whereof I have hereunto set my hand.

ROBERT H. POSTLETHWAITE.

Witnesses:

N. A. ACKER,

D. B. RICHARDS.