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M. S. GODIT.
TRIPLET BUCKET LADDER DREDGE.
APPLICATION FILED APR. 15, 1910.

Patented July 18, 1911.

5 SHEETS—SHEET 1.

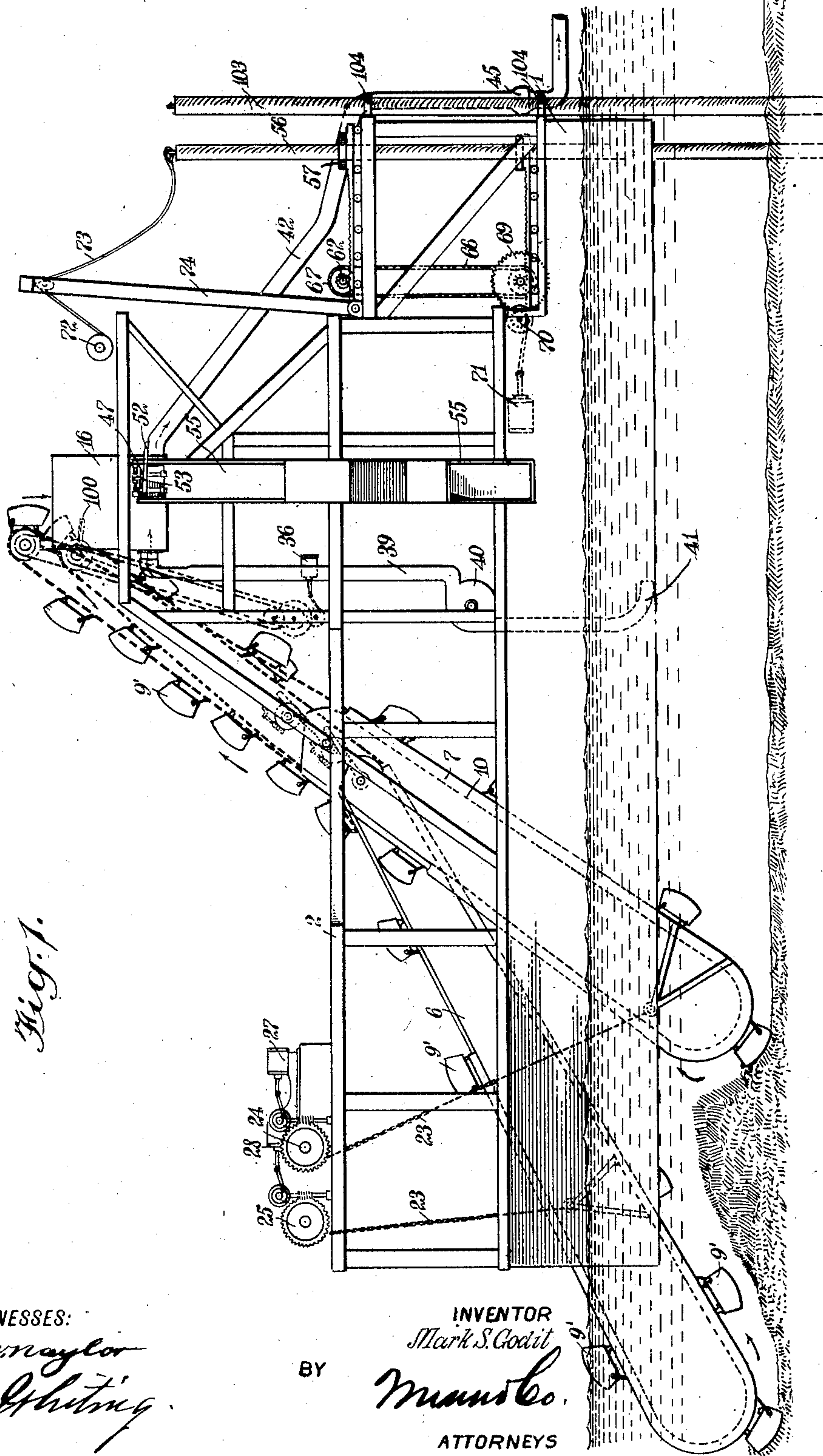


Fig. 1.

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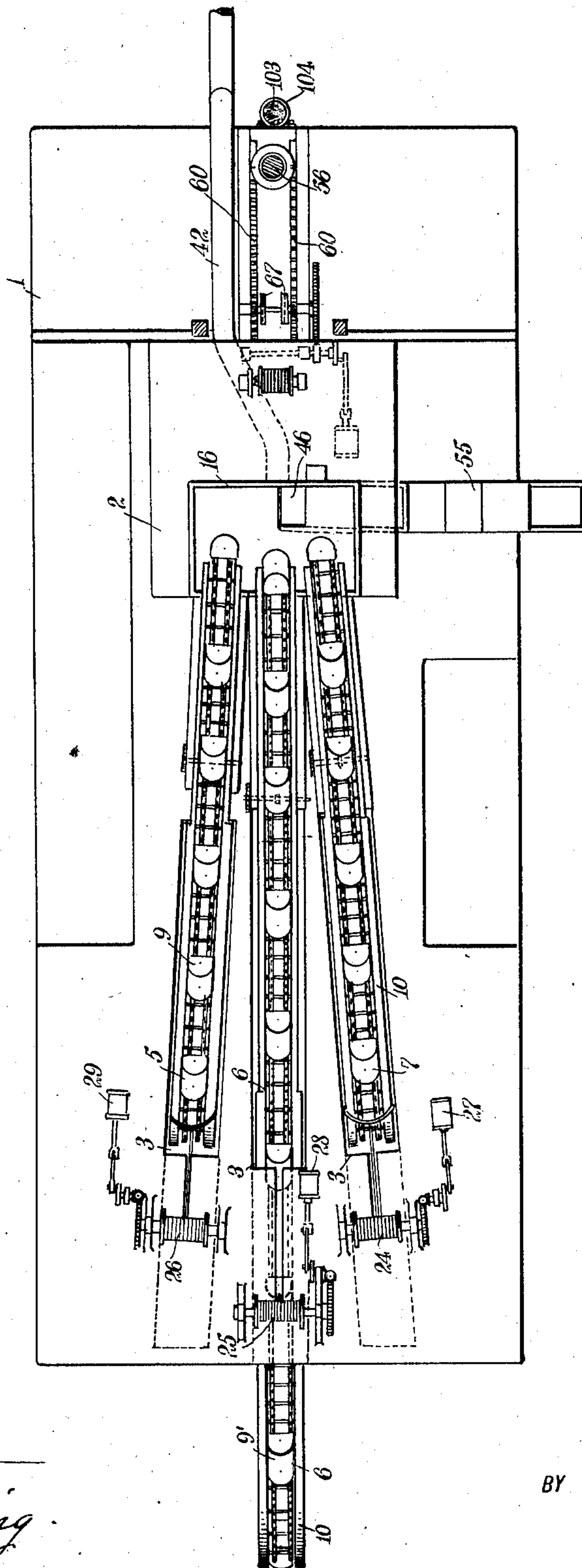
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5 SHEETS—SHEET 2.

Fig. 2.



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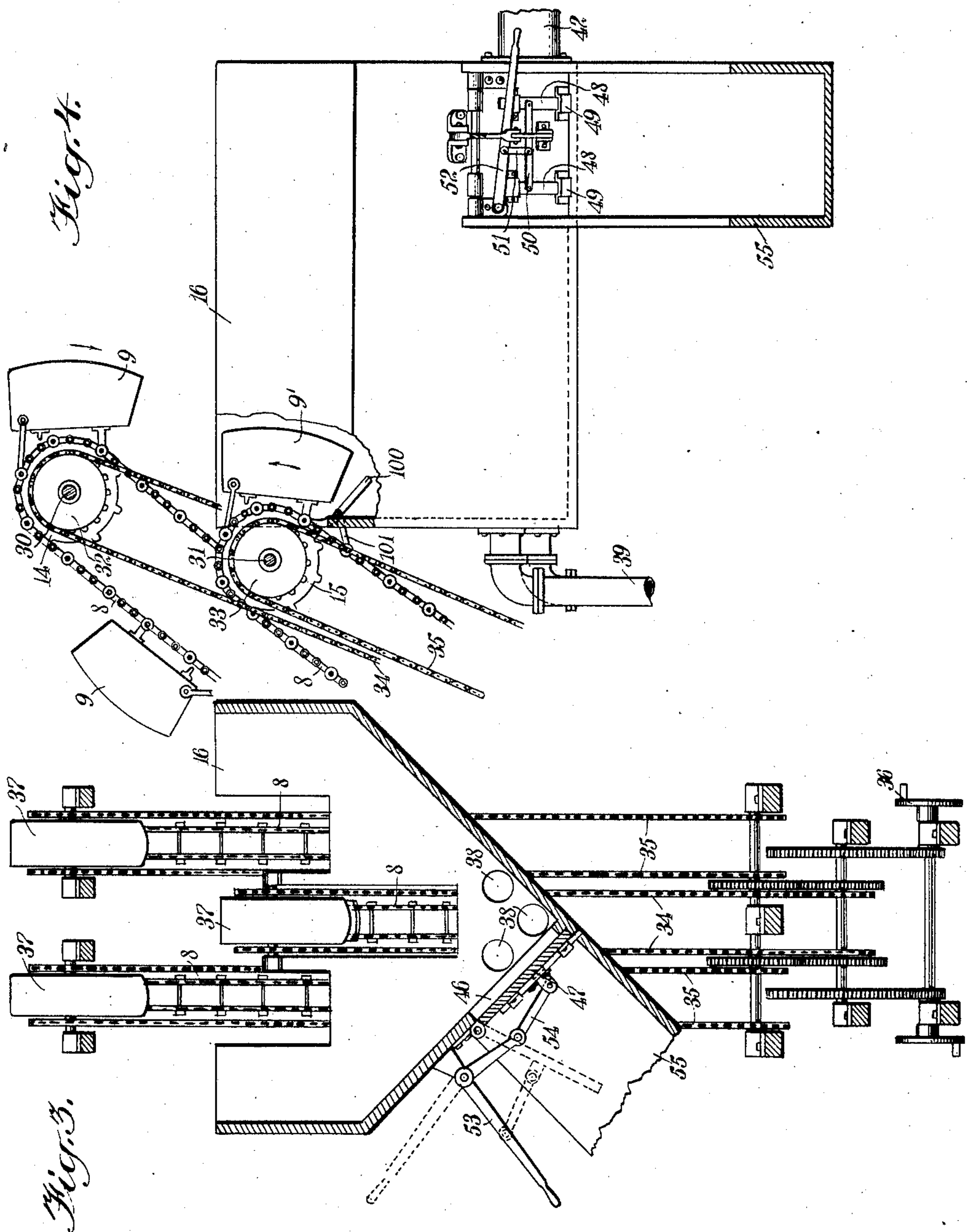
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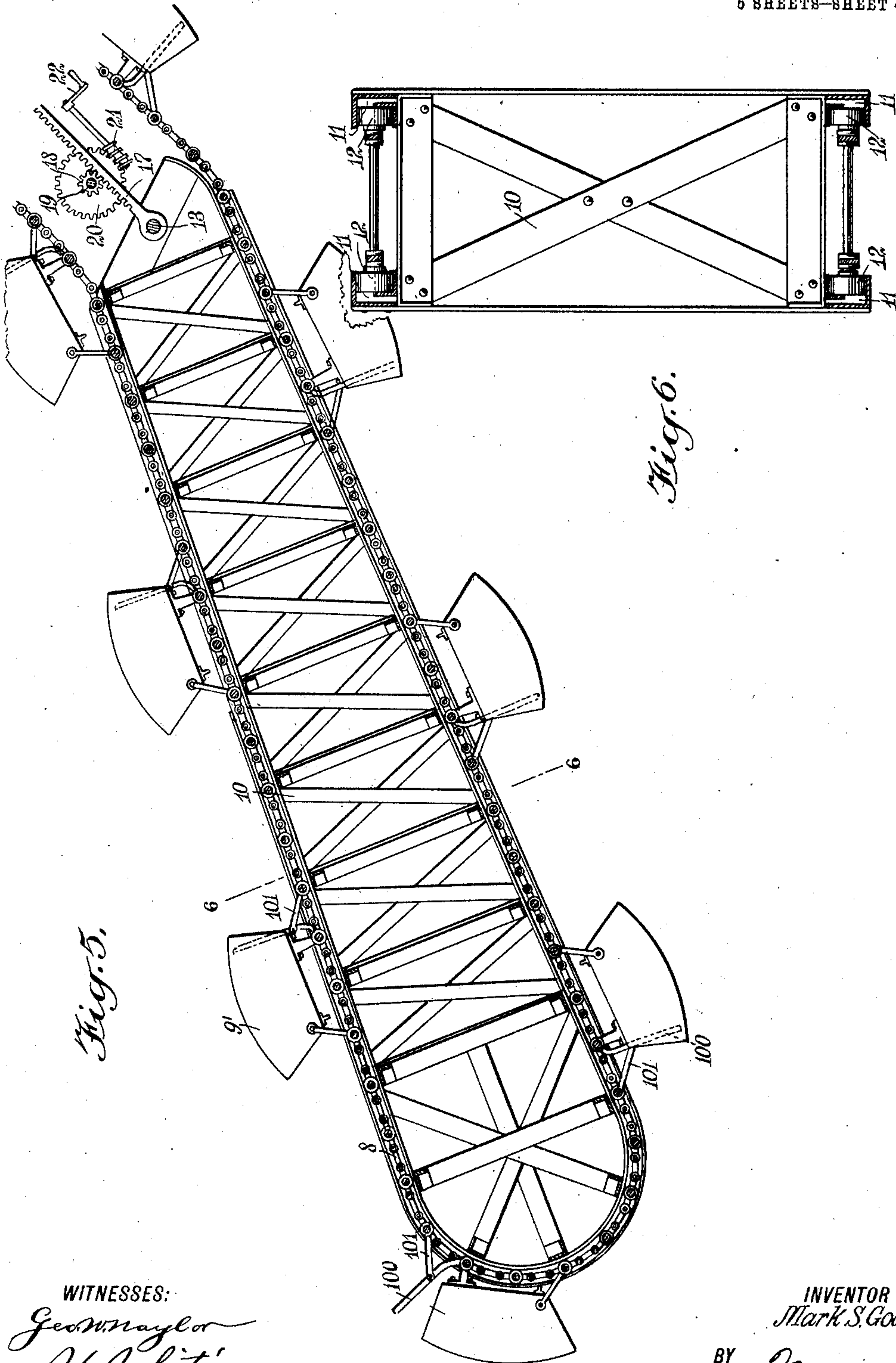


Fig. 5.

Fig. 6.

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5 SHEETS—SHEET 5.

Fig. 7.

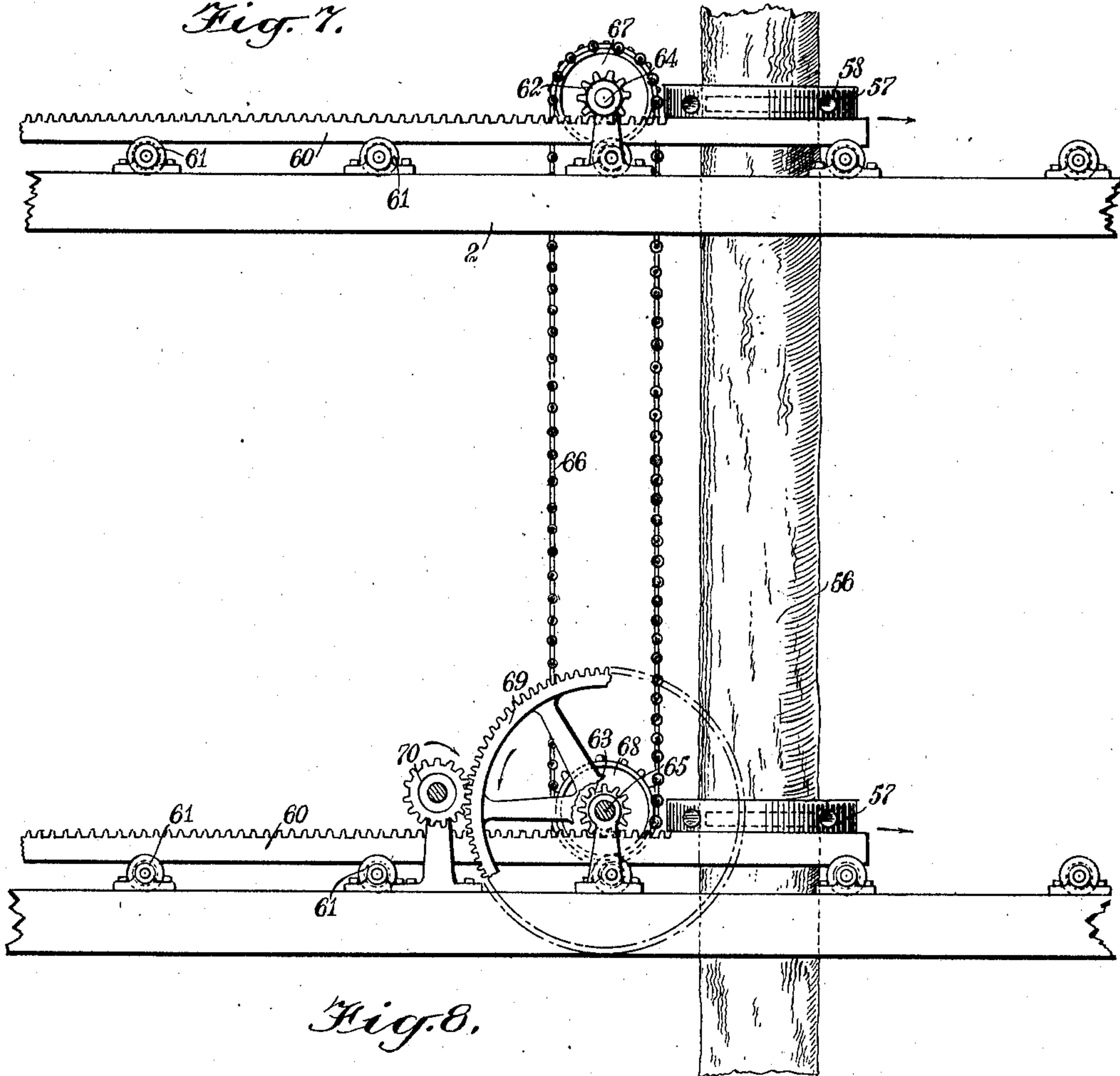
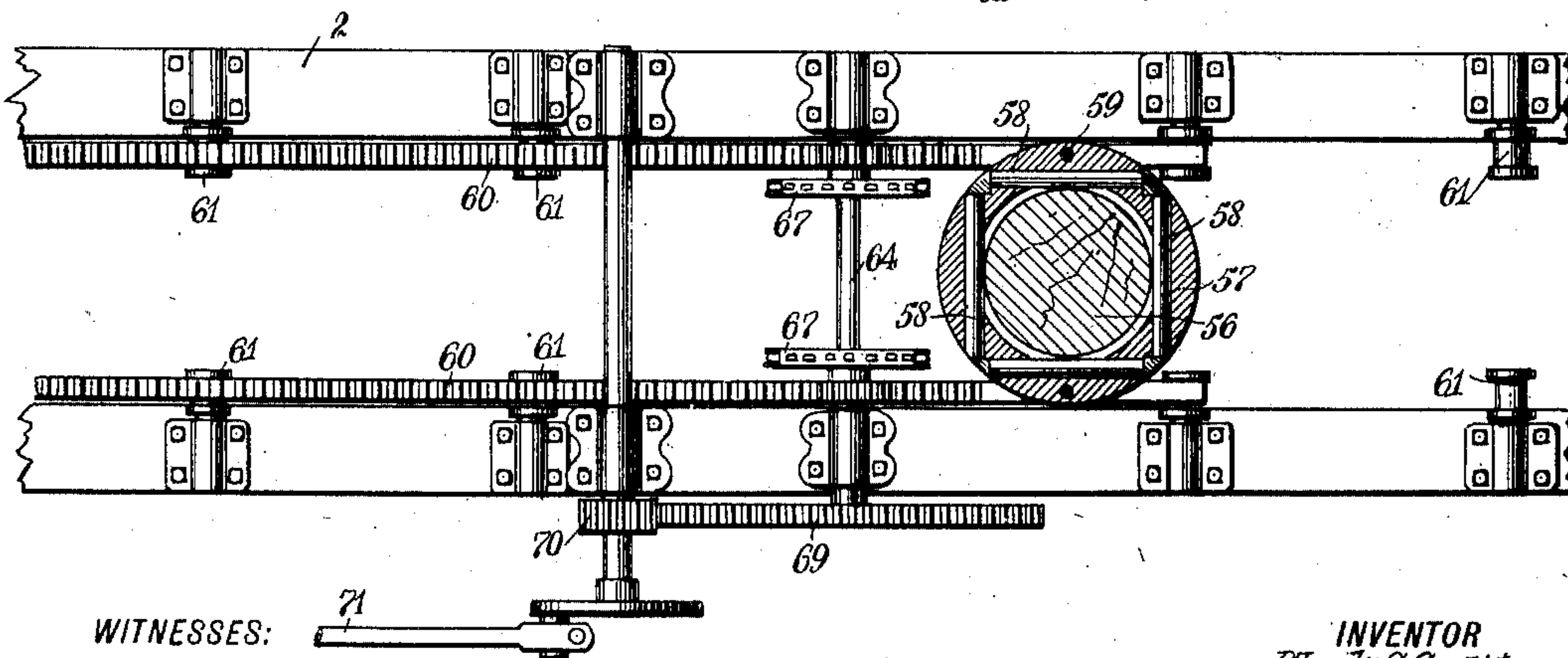


Fig. 8.



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UNITED STATES PATENT OFFICE.

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TRIPLET BUCKET LADDER-DREDGE.

998,495.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed April 15, 1910. Serial No. 555,735.

To all whom it may concern:

Be it known that I, MARK S. GODIT, a citizen of the United States, and a resident of West Wareham, in the county of Plymouth and State of Massachusetts, have invented a new and Improved Triplet Bucket Ladder-Dredge, of which the following is a full, clear, and exact description.

This invention relates to a new and improved dredge of the endless-bucket type, in which a plurality of individual bucket ladders are provided.

An object of this invention is to provide a device which will be simple in construction, comparatively inexpensive to manufacture, strong, durable, efficient in its operation, and readily adjustable.

A further object of this invention is to provide a dredge with a plurality of ladders having endless bucket systems thereon, one of which operates in advance of the others in such a manner that a more efficient operation of the device is obtained.

These and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth in the claims.

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

Figure 1 is a side view in elevation; Fig. 2 is a top plan view; Fig. 3 is a fragmentary transverse vertical section through the dumping hopper; Fig. 4 is an enlarged fragmentary view in elevation, of the dumping hopper, showing parts thereof in section; Fig. 5 is an enlarged side view in elevation of one of the ladders, showing the connection of the endless bucket chains thereto and the means for adjusting the ladder; Fig. 6 is a vertical section on the line 6—6 of Fig. 5; Fig. 7 is an enlarged fragmentary view in elevation, showing the means for advancing and adjusting the dredge relative to the spud; and Fig. 8 is a top plan view of the members shown in Fig. 7.

Referring more particularly to the separate parts of the device, 1 indicates the body of the dredge, which is provided with a superstructure or frame 2 for supporting various parts of the mechanism. The body 1 is provided with a plurality of outlets 3 extending through the bottom thereof, which

provide suitable passages, through which extend a plurality of dredgers 5, 6 and 7, preferably three in number.

It is to be noted that the intermediate dredger 6 is somewhat longer than the pair of side dredgers 5 and 7, and therefore extends considerably ahead of these side dredgers, so that it works in advance thereof and forms a path, along the sides of which the dredgers 5 and 7 may operate. While these dredgers 5 to 7 may be of any suitable character, they preferably consist of endless chains 8 provided at suitable intervals with buckets 9 and 9', and are supported at their lower ends, in a manner to be described, in ladders 10. The buckets 9' on the intermediate foremost dredger 6 differ from the buckets 9, as this dredger is adapted to run in the opposite direction. In order that the buckets 9' may automatically dump, each one is provided with a pivoted end 100, which is pivotally connected to the chain 8 by a brace 101.

The specific form of the ladders 10 will be seen by reference to Figs. 5 and 6. The body of each of the ladders 10 consists of a suitable light metallic framework, properly reinforced so as to form a strong structure, and is provided at its top and bottom, on each side thereof, with suitable channels 11, in which are adapted to run rollers 12 on the endless chains 8, so that the chains will be properly guided in a frictionless manner on the ladders. Each of the ladders 10 is pivotally secured to the superstructure or frame 2 by means of suitable shafts 13, so that they can be manipulated up and down and thereby bring the buckets into the desired relation with the ground to be dredged. The upper ends of the dredger chains 8 pass over suitable sprockets 14 and 15, located in juxtaposition to a hopper 16.

In order that the tension of the chains 8 may be varied and the slack therein taken up, each of the ladders 10 is provided with a rack 17, which is secured to the ladder in any well known manner, as by means of the shaft 13, and engages a pinion 18 on a shaft 19. The shaft 19 is provided with a worm wheel 20, which is engaged by a worm 21, the latter being operated by a suitable hand crank 22. It will thus be seen that by rotating the hand crank 22, the relative position of the ladder 10 and the frame 2 can be varied so as to adjust the tightness of the chain 8 and vary the slack therein.

For the purpose of swinging the outer ends of the ladders 10 up and down and thereby bringing them out of and into engagement with the ground to be dredged, there are provided flexible connections 23 for each of the ladders, which pass over suitable drums 24, 25 and 26. These drums 24 to 26 may be driven in any suitable manner, but preferably by separate motors 27, 28 and 29. The sprocket wheels 14 and 15 which drive the endless bucket chains 8 are secured in any well known manner to shafts 30 and 31, which are provided with sprockets 32 and 33. The latter are connected in driving relation, by means of chains 34 and 35, to any suitable source of motive power, such as individual engines, or by suitable gearing, to a common engine, indicated at 36. Where the endless bucket chains 8 pass over the sprocket wheels 14, there are provided rollers 37, on which the buckets 9 are adapted to rest while dumping into the hopper 16, in close juxtaposition to which the sprocket wheels 14 and 15 are arranged. The position of the rollers 37 is such that the buckets 9 will dump their load in the bottom of the hopper 16 right in the path of a stream of water, furnished thereto by means of a plurality of inlets 38, connected to a pipe 39, which in turn is supplied by a suitable pump 40 from an intake pipe 41, which dips into the water in which the dredge floats. The stream of water disintegrates the material in the hopper, and forces it through an outlet pipe 42, which extends over the rear of the dredge to any suitable point. For the purpose of permitting the relative adjustment of the members of the pipe 42, it is provided at suitable intervals with universal ball-and-socket joints 45.

In order that any stones which are carried up by the buckets 9 and deposited in the hopper 16 may be readily gotten rid of, the hopper 16 is provided adjacent its bottom with an outlet 46, which is normally closed by a door 47 hinged to the hopper 16 in any well known manner. The door 46 is normally locked in its closed position by one or more bolts 48, slidingly secured to the door and engaging locking members 49 secured in any well known manner to the hopper 16. The bolts 48 are connected in any well known manner, as by means of a bar 50 and a link 51, to an operating lever 52. When the bolts 48 are released by manipulating the operating lever 52, the door 47 can be opened by swinging it from the full-line position indicated in Fig. 3 to the dotted line position, by means of a bell crank lever 53, which is connected to the door in any well known manner, as by means of a link 54.

Coextensive with the outlet 46 which is controlled by the door 47, there is provided

a chute 55, which extends over the side of the dredge 1, so that a scow may be placed alongside of the dredge and the boulders accumulated for any particular purpose.

For the purpose of securing the dredge adjustably to the ground, there is provided adjacent the rear thereof, a spud 56, on which are provided one or more superposed collars 57. It will be seen by reference to Figs. 7 and 8 that these collars are provided with a plurality of anti-friction rollers 58, which engage the spud and permit the collar and thus the dredge to move up and down relative to the spud, to allow for any usual vertical movement of the dredge.

Secured to the collars 57 in any well known manner, as by means of pins 59, there are provided one or more racks 60, which are anti-frictionally supported on suitable rollers 61 rotatably supported on the frame 2 in any well known manner. Both the upper and lower racks 60 are engaged by suitable pinions 62 and 63 on shafts 64 and 65, which are suitably supported in any well known manner on the frame 2. The upper shaft 64 is driven from the lower shaft 65 by means of one or more sprocket chains 66, which run over sprockets 67 and 68 secured respectively to the shafts 64 and 65. The shaft 65 is provided at its outer end with a gear 69, which meshes with a pinion 70, which is driven by any suitable motor, indicated by the steam engine 71. It will thus be seen that by driving the shaft 65, the pinions 62 and 63 will be driven, thus advancing the dredge relative to the racks 60 and the spud 56. When the dredge has been advanced the limit of the racks 60, the spud 56 can be removed from its engagement with the ground by means of a suitable hoisting device, indicated at 72, which is connected by means of a suitable flexible connection 73 to the spud 56. This flexible connection 73 is supported in any well known manner by a suitable derrick 74, which coöperates with the hoisting mechanism 72 to remove the spud 56 from the ground. During the shifting of the spud 56 from one location to another, the dredger is held in place by an auxiliary spud 103, which is removably secured to the body of the dredger in any well known manner, as by means of the collars 104, and is manipulated by hoisting mechanism 72 and the derrick 74.

The operation of the device will be readily understood when taken in connection with the above description. The dredgers 5, 6 and 7 are adjusted by means of the hoisting drums 24 to 26 to a depth suitable to the extent of dredging desired. The middle dredger 6, which is in advance of the side dredgers 5 and 7, and which travels in the opposite direction, forms a path, along the sides of which the dredgers 5 and 7 are

adapted to dig. This method of using a plurality of dredgers permits a larger channel to be dug at one time, and lessens the expense of operation inasmuch as the same number of people can take care of three dredgers as would be necessary in the case of one dredger. When the dredging operation has been continued any length of time in one spot, the dredge is advanced bodily by starting the motor 71, which drives the dredge forward relative to the racks 60 and the spud 56. When the limit of the racks has been reached, the spud is readily pulled up out of the ground and inserted in another place, the dredge being held in the meantime by the auxiliary spud 103. The buckets 9 and 9' carry the material excavated up over the sprockets 14, where the buckets 9 naturally drop it out of their open ends, and the buckets 9' have their pivoted ends opened by the relative movement of the braces 101 and the buckets 9', when passing over the curved sprockets 14. The material is deposited in the hopper 16, directly in the path of the stream or in through the inlet openings 38. The size of these openings is such as to permit a plurality of streams to enter and yet prevent any quantity of material falling back into the pump 40, should the source of power for the pump be cut off for any reason. The streams of water let into the openings 38 force the material through the outlet pipe 42, which is carried on a plurality of pontoons 43 and 44 to any required place where it is desired to deposit the material. The large boulders which cannot pass through the outlet pipe 42 can be removed at suitable intervals by opening the door 47 and permitting them to slide down the chute 55 into a scow juxtaposed to the side of the dredge.

While I have shown one embodiment of my invention, I do not wish to be limited to the specific details thereof, but desire to be protected in various changes, modifications and alterations which may come within the scope of the appended claims.

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

1. In an excavator, the combination with a body adapted to move along in a substantially horizontal direction, of a plurality of dredgers disposed on said body in the form of a wedge, with one of said dredgers projecting horizontally in advance of the others

of said dredgers so as to form a path, along the sides of which the other dredgers may subsequently excavate.

2. In an excavator, the combination with a body adapted to move along in a substantially horizontal direction, of a plurality of dredgers disposed on said body in the form of a wedge, with one of said dredgers projecting horizontally in advance of the others of said dredgers so as to form a path, along the sides of which the other dredgers may subsequently excavate, and means for advancing said body to advance said dredgers.

3. In an excavator, the combination with a body adapted to move along in a substantially horizontal direction, of a plurality of dredgers disposed on said body in the form of a wedge, with one of said dredgers projecting horizontally in advance of the others of said dredgers so as to form a path, along the sides of which the other dredgers may subsequently excavate, and individual means for adjusting the position of each of said dredgers independently of every other dredger.

4. In an excavator, the combination with a body, of a plurality of dredgers located on said body, one of said dredgers being located intermediate the others of said dredgers and projecting at its lower end in front of said other dredgers in a horizontal direction, and also extending at its upper end substantially below the upper ends of the others of said dredgers.

5. In an excavator, the combination with a body, of a plurality of dredgers located on said body, one of said dredgers being located intermediate the others of said dredgers and projecting at its lower end in front of said other dredgers in a horizontal direction, and also extending at its upper end substantially below the upper ends of the others of said dredgers, and a common hopper for said dredgers, said dredgers converging from the front to the rear where they project into said common hopper, and whereby a sufficient leeway is permitted for the front and lower ends of said dredgers.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MARK S. GODIT.

Witnesses:

JOSIAH L. ELDREDGE,
EDWARD A. GAMMON.