(No Model.) 5 Sheets—Sheet 1.

T. Z. COLE.

CONVEYER FOR DREDGING AND DITCHING MACHINES.

No. 342,583. Patented May 25, 1886.

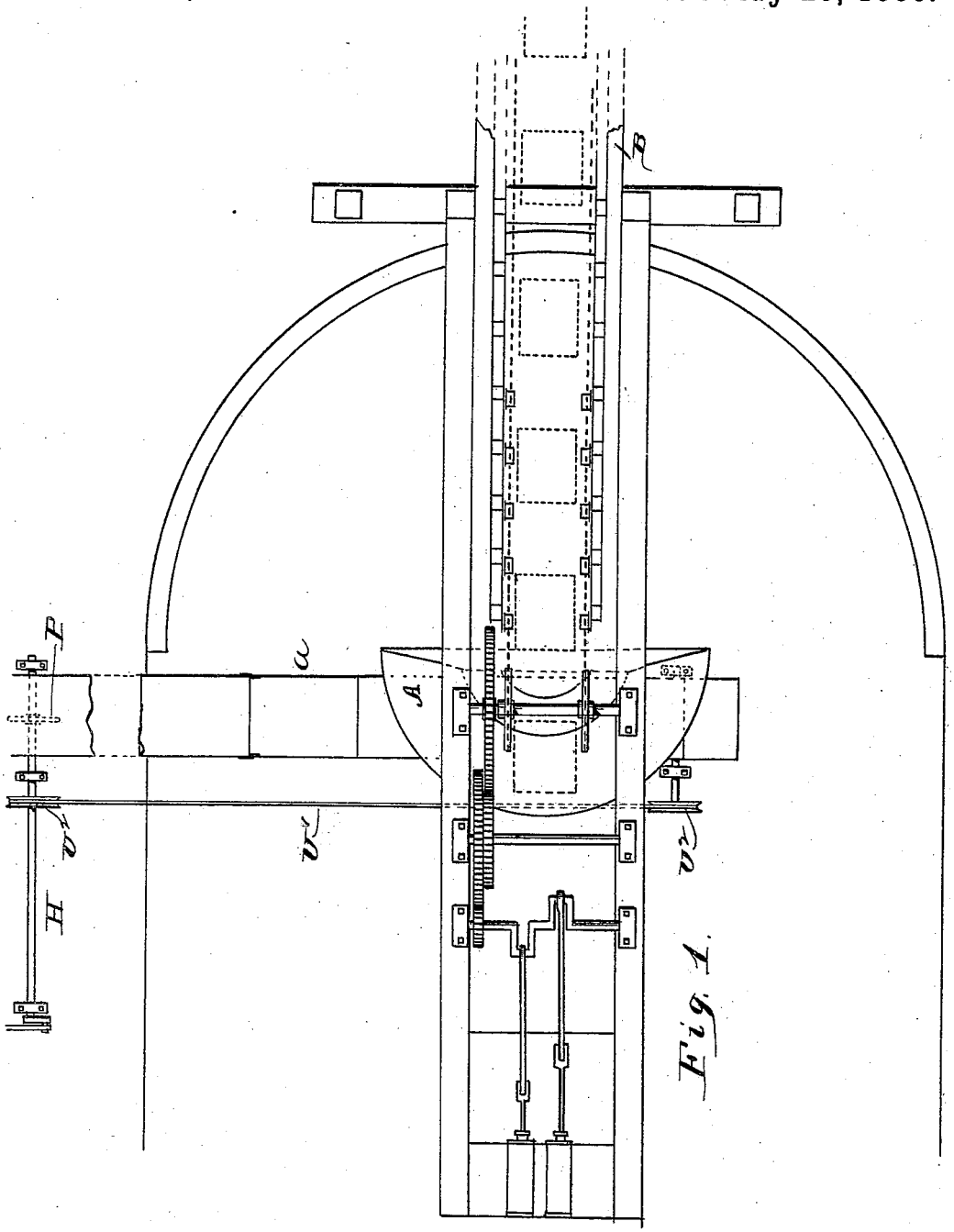

Fig. 1.

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Attorney.

(No Model.)

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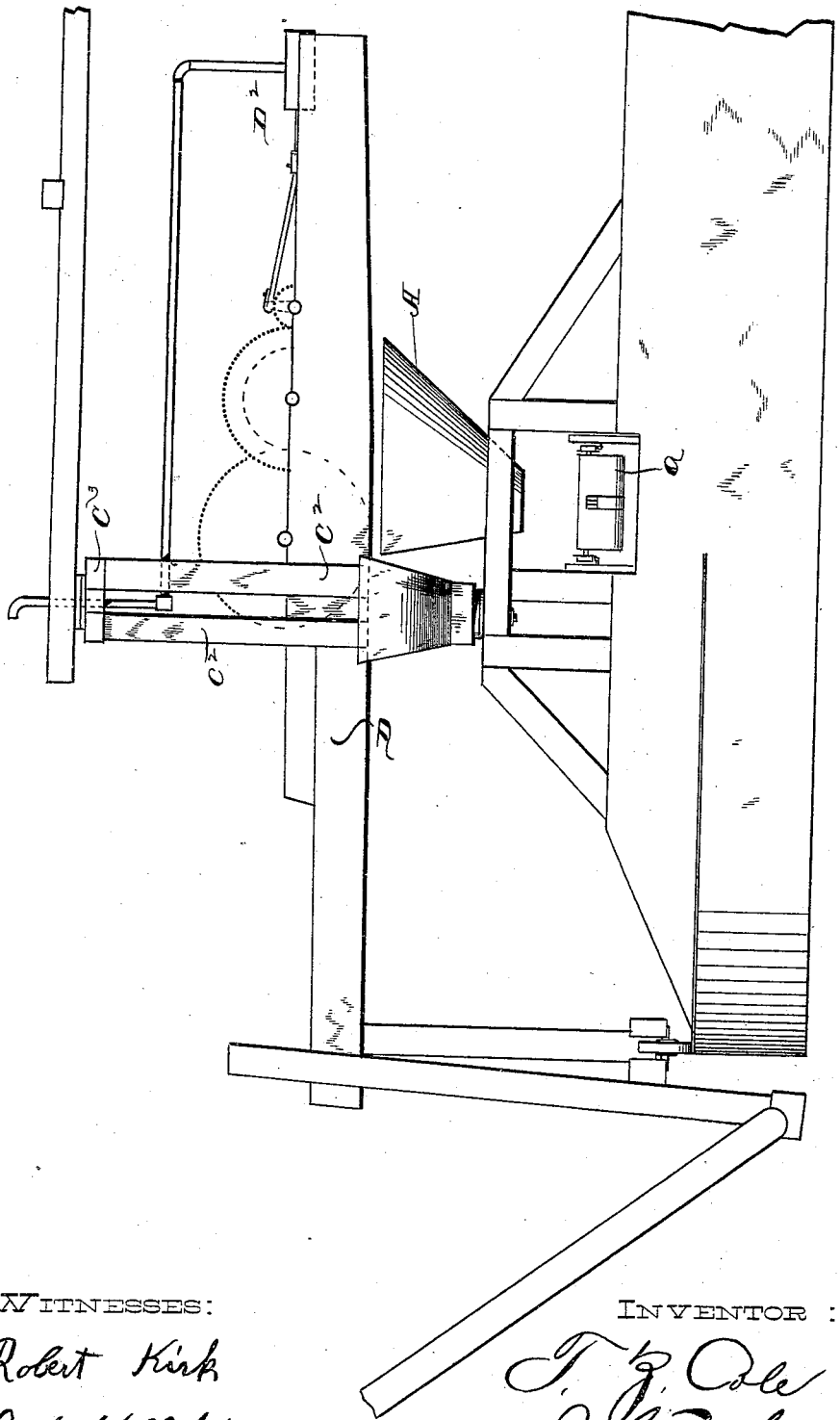

Fig. 2.

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(No Model.) 5 Sheets—Sheet 3.

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CONVEYER FOR DREDGING AND DITCHING MACHINES.

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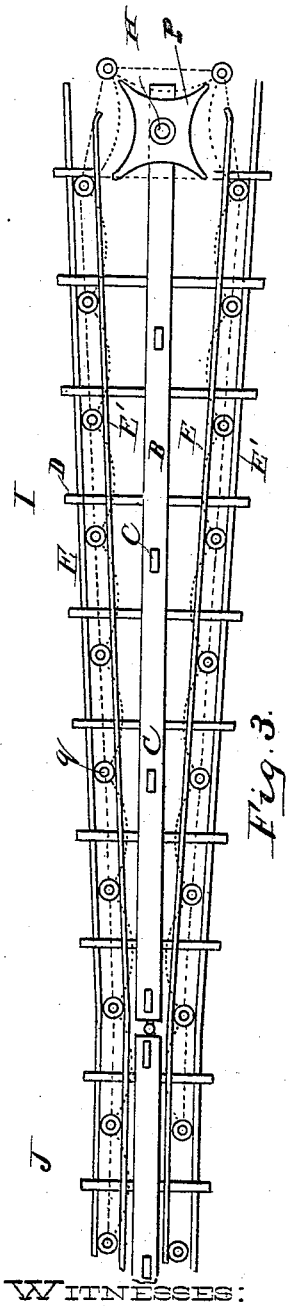

Fig. 3.

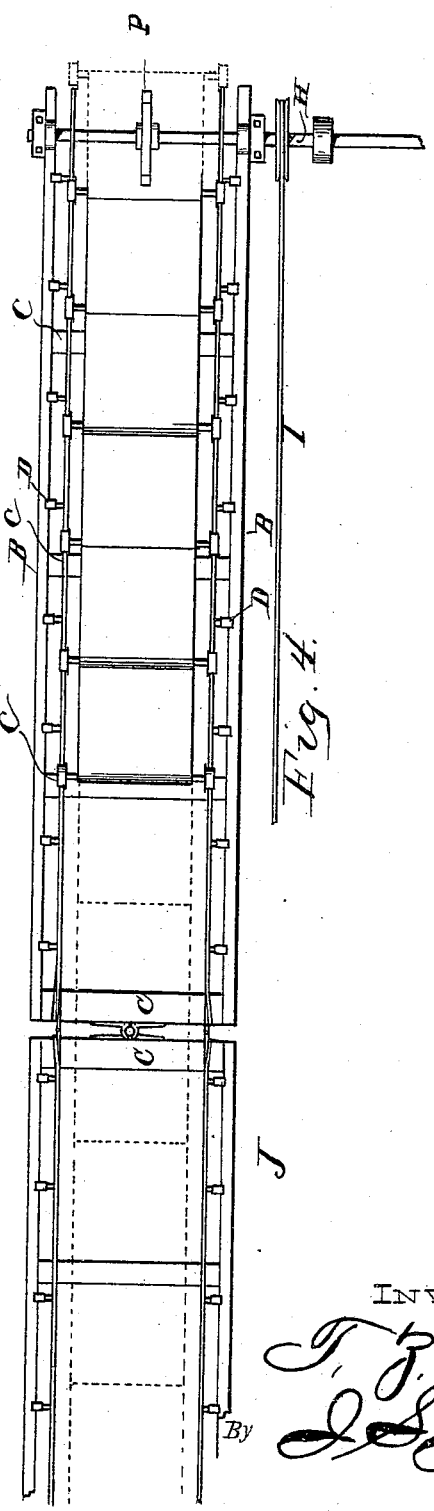

Fig. 4.

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CONVEYER FOR DREDGING AND DITCHING MACHINES.

No. 342,583. Patented May 25, 1886.

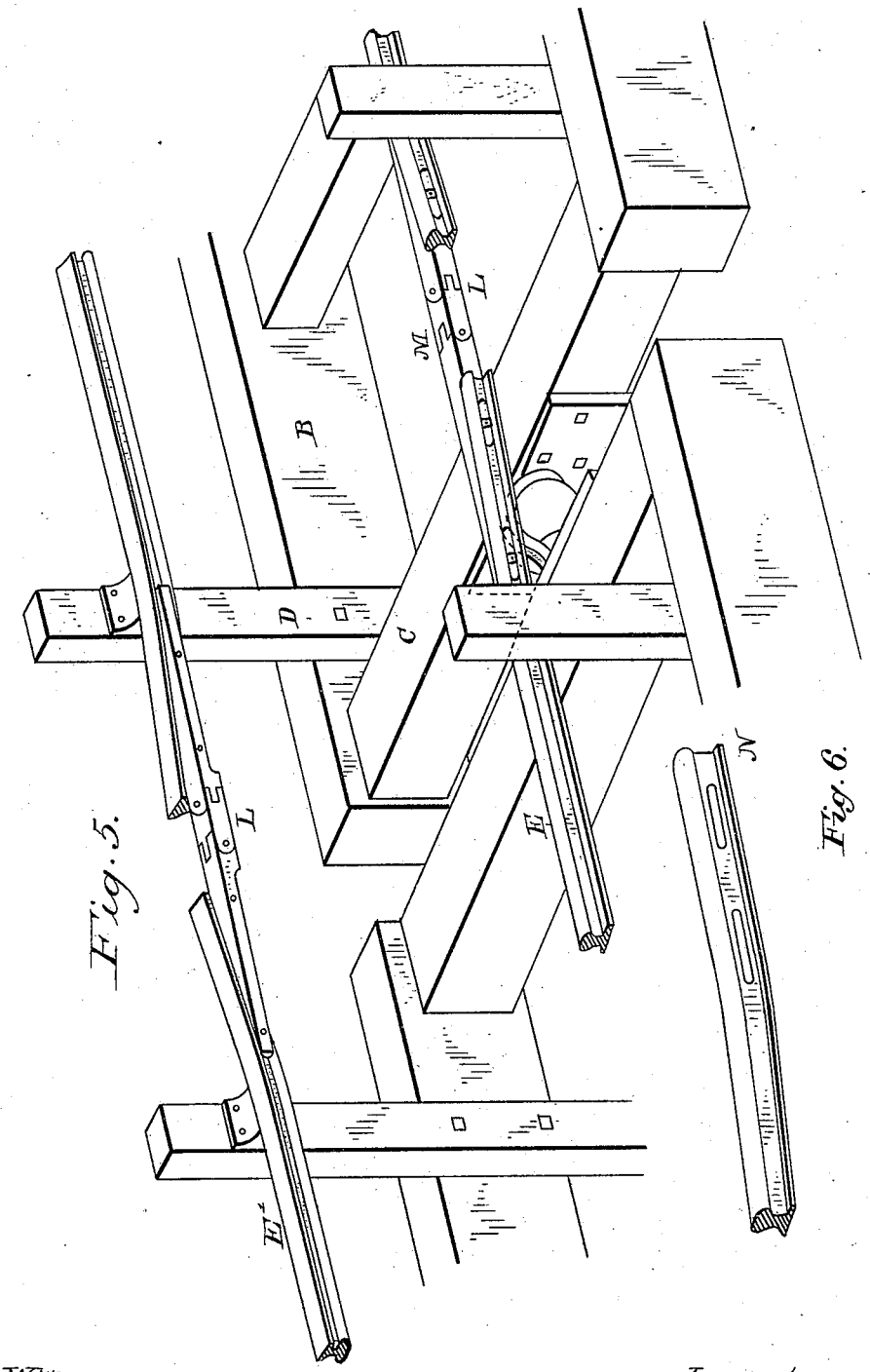

Fig. 5.

Fig. 6.

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(No Model.) 5 Sheets—Sheet 5.

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CONVEYER FOR DREDGING AND DITCHING MACHINES.

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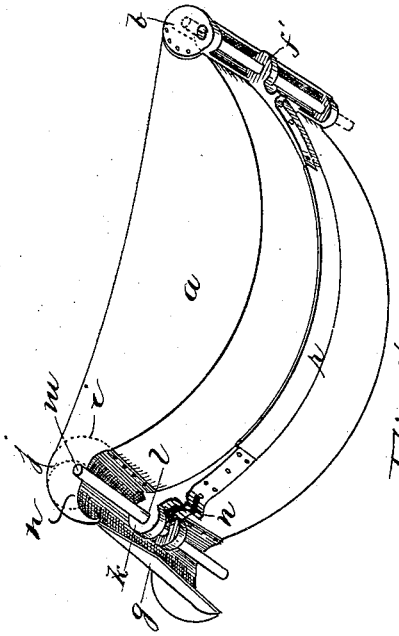

Fig. 8.

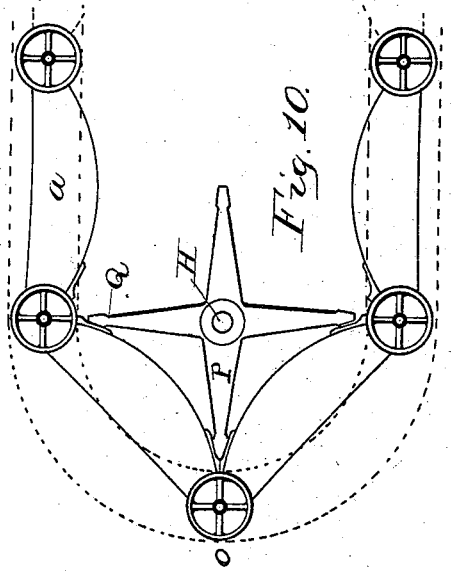

Fig. 10.

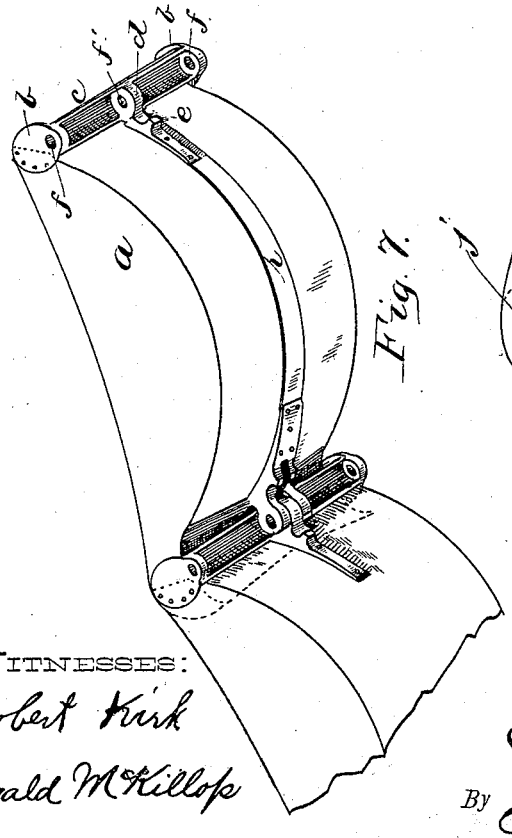

Fig. 7.

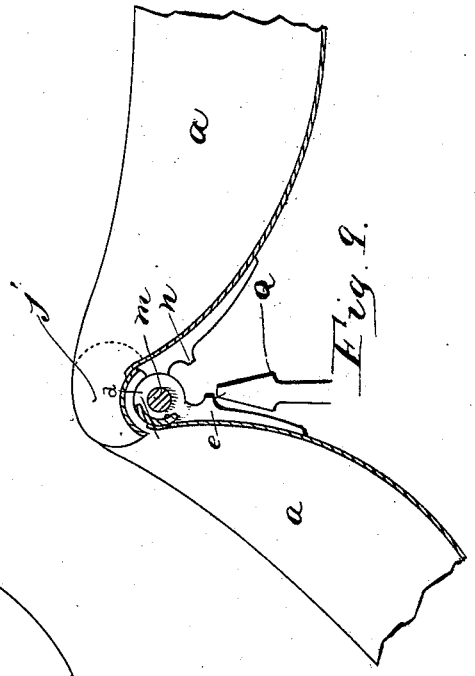

Fig. 9.

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UNITED STATES PATENT OFFICE.

THOMAS Z. COLE, OF NEW ORLEANS, LOUISIANA, ASSIGNOR OF ONE-HALF TO HENRY WILSON, OF DENVER, COLORADO.

CONVEYER FOR DREDGING AND DITCHING MACHINES.

SPECIFICATION forming part of Letters Patent No. 342,583, dated May 25, 1886.

Application filed May 26, 1885. Serial No. 166,721. (No model.)

To all whom it may concern:

Be it known that I, THOMAS Z. COLE, of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and useful Improvement in Conveyers for Dredging and Ditching Machines, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a plan view of the dredging-machine having the conveyer attached thereto. Fig. 2 is a side elevation showing the front end of the scow; Fig. 3, a side elevation of the conveyer frame and buckets; Fig. 4, a top view of the same; Fig. 5, an enlarged isometric view of the joint connecting two sections of the conveyer frame; Fig. 6, a perspective view of connecting end of the track; Fig. 7, a perspective view of the under side of the conveyer-bucket, showing the arrangement of the joint; Fig. 8, a perspective view of the under side of the bucket, showing the manner of attaching the rocking saddle to the bucket; Fig. 9, a central vertical section of the buckets at the hinge; and Fig. 10 shows a side view of the pulley for holding the conveyer-buckets.

The present invention is designed to provide an efficient conveyer for removing the dirt from the scow, boat, or car of a dredging-machine to a suitable point beyond the reach of the vessel or car upon which the dredger is mounted; and it consists of a series of buckets hinged together so as to form an endless chain and conveyer-frame adapted to be made in sections, so that it can be extended to any desired distance, and is also capable of being elevated or depressed or turned at any suitble angle other than a straight line from the boat, all of which will now be set forth in detail.

As shown in Fig. 1, the discharge ends of the buckets of the dredger, which are mounted on a boat, scow, or car, are provided with a semicircular hopper, A, so that the discharges of the bucket will be conducted down through the mouth of the funnel or hopper to the central point on the frame which carries the conveyer-buckets. Directly beneath the mouth of this hopper is located the frame which carries the conveyer-buckets. In practice I prefer to have the conveyer-frame located across the scow or car at right angles to the length of the boat or car, although it is obvious that this may be changed, so that the conveyer-frame will extend out at any angle thereto.

The conveyer-frame proper consists of two parallel beams, B, placed a suitable distance apart and made in any suitable length, so as to form one section, and these beams have at suitable intervals cross-ties C, by means of which they are held together firmly. The frame thus constructed is secured to the boat by means of suitable posts and braces, (not shown herein,) and on the inner side of each beam B are placed at intervals vertical bars D, which project above and below the beams B, as shown more fully in Figs. 3 and 4. Two parallel tracks or guideways, E E′, are secured to these bars, one pair of these tracks being above the beams B and the other pair, E E′, below the beams B. Between these tracks or guideways the rollers or casters of the conveyer-buckets roll. The pulley F, located at the inner end of one of these sections on the cross-shaft G, is designed to carry the inner end of the bucket-train, while the outer end of the same section or of the adjacent section is designed to have a similar pulley, also provided with a shaft.

It has been customary heretofore in driving conveyer-buckets of this character to use an engine located on the boat or car. It is obvious that to operate these conveyer-buckets by means of power so located the motion is imparted to the loaded buckets through the lower or inverted buckets which are returning to the boat, and to obviate this, so that the direct strain will be on the loaded buckets themselves, and to cause the pull of the engine to be directly on the loaded buckets themselves, I locate the power-engine for the conveyer on the shore or near the outer end of the conveyer-frame, as shown by the shaft H in Fig. 1, which is designed to represent the engine-shaft located upon the land at the outer end of the conveyer-frame.

As shown in Figs. 3 and 4, wherein I represents the inner section and J the outer section or extended part of the frame, it is necessary to so construct the hinge or attachment between these sections that they may be produced either on a direct line or at a slight angle to each other, and may also be placed on different levels relative to each other, and I therefore design having a ball-joint centrally between the two end ties, C, as shown at

K, Fig. 5. An ordinary ball-and-socket joint will answer for this purpose, and to enable the outer end of the section J to be moved to the right or the left, the joint K is so placed between the cross-ties C as to afford some space between the same. The tracks E E′ of each section extend to a point half-way across the upper face of the cross-tie C, and on the inner side between the ends of these abutting rails, on the adjacent sections, is placed a plate or tie, L, having a central and double joint, M. This joint may be a ball or socket joint somewhat similar to the joint K, or it may be simply a joint capable of moving in two directions by having two pivots at right angles to each other, as shown. The ends of the tracks E E′ have slots N, so that the bolts O on the plates L pass through said slots and enable the ends of the rails E′ to approach together or recede from each other when a change is made in the direction of the sections independently of each other.

In consequence of the use of independent sections, as shown, and since it is necessary to use a greater or less number of buckets when two or more sections are used, it is essential to provide a ready means for connecting the buckets to each other and for readily detaching them and laying them aside when not required for use, and at this point it may be well to state that at least two sections will be used in practice at any one time. Two of these sections should be made in the form represented by section I of Fig. 3, wherein the tracks E E′ on the opposite sides of the beams B converge toward each other from the inner or pulley end of the frame, so that the outer end of section I will have the tracks as close to the beam C as possible, while the inner end of the tracks are spread apart, so as to conform to the location of the buckets, as they travel around the pulley F. The first section I would therefore extend over the boat or car a short distance, and a section similar to I has its narrow end abutting the outer end of this inner section. The intermediate sections, if they should be used, would have the tracks E E′ parallel to the beams B, as shown by section J.

The pulley P carries and drives the conveyer-buckets, and is on the outer shaft, H. The pulley proper is a four-pointed or star-shaped spider, Q, or it may be provided with four points, Q, secured to the shaft at a point centrally between the beams B or midway along the line of the buckets; and to more fully understand how the buckets rest thereon it will be necessary to describe the construction of the under sides of the buckets and to detail their hinged connections.

The conveyer-bucket is composed of semicircular sides having the bottom riveted thereto, so that the sides will project above the bottom at the ends or have vertical flanges projecting above the bottom of the bucket near those points which are hinged together. The rear end of each bucket *a* has a circular flange, *b*, on each side, and this flange is cast with or attached to the inverted trough *c*, which extends across the end of the bucket-bottom. Cast therewith centrally and on the under side is a tongue or nib, *e*. Apertures *f*, through the flanges *b*, and an aperture, *f′*, through the tongue *d*, centrally, are formed on a direct line, so as to receive the same rod. In case the bottom is cast, or if either the sides or bottom should be cast, the trough *c*, with the tongue *d* and stop or lug *e*, as well as flanges *b*, may be cast together or with either the bottom or the sides and afterward riveted together; or the parts herein named may be made separately and afterward riveted or otherwise joined together. The opposite or forward end of the bucket is provided with a saddle, *g*. This saddle or inverted trough-shaped piece is centrally depressed or so formed that centrally in cross-section its arc is much less than the arc of the ends in cross-section. Thus in Fig. 8 the circle *h* in the dotted lines at the end of the saddle nearest the eye represents the arc through the center of the saddle, and the circle *i* the arc of the end of the saddle. Each end of this saddle has a crescent-shaped upwardly-projecting flange, *j*. Centrally on the under side of this saddle are two ears, *k*, between which the tongue *d* of the adjacent bucket is to be placed. These ears have also holes *l*, to receive the straight cross-rod *m*, the said cross-rod also passing through the holes *f f* of the flanges *b* and the central hole, *f′*, in the tongue *d*. Below the ears is a lug, *n*, similar to the lug *e* below the tongue *d*. The bracket containing the lug *n* and ears *k* may be cast with the bottom of the bucket or with the saddle *g*, and afterward united, or the saddle *g* and bucket *a* may also be cast together and afterward joined, or the entire bucket with the saddle and the bracket may be cast in one piece. Instead of having the crescent-shaped flange *j* on each end of the saddle, the side of the bucket may be made in that shape, so as to obviate the necessity of constructing an additional piece; but these are matters which can be left to the judgment of the mechanic in constructing the same. It will thus be observed that the buckets are hinged to each other centrally, and that the flanged end *j* enters between the flanges *b b* of the adjacent bucket, and that the saddle *g* extends over the trough *c*, thereby covering up the hinged part *k*, excluding all dirt therefrom.

The object of having the saddle centrally depressed is to provide for the side movement necessary in causing the buckets to travel along the conveyer-frame when they extend at a different angle from each other, as heretofore stated, there being sufficient play in the ends of the saddle to permit the adjacent end of the bucket to move backward and forward a limited distance.

As shown in Figs. 9 and 10, when the end of the bucket approaches the pulleys on the shafts G or H the point Q of the pulley strikes

the lug *e* on the under side of the bucket, and as the pulley turns and causes the forward end of the bucket to descend the corresponding lug, *n*, on the adjacent bucket approaches the lug *e*, and finally unites when in the position shown at *o*, Fig. 10. Thus the point of the spider-pulley rests against both these lugs and exerts its power directly against the brackets which are attached to the bottom of the buckets, the re-enforcing band *r* being also in connection with said bracket along the bottom. The hinge-rod *m* carries at each end a wheel or caster, *q*, which travels between the parallel tracks E E′, and these wheels may be fastened on in any suitable or well-known manner not necessary to here set forth.

It is obvious that should it be desired at any time to remove any number of buckets, or to replace one or more, it can readily be done by removing the hinge-rods *m*.

It is designed to have the train of conveyer-buckets continually in motion when in the operation of conveying dirt or removing the discharges of the buckets of the dredger.

What I claim as new is—

1. The conveyer-frame having at one end a ball-and-socket joint for attaching adjacent sections together, in combination with the ends of the rails or guides having slots and a plate or bar having centrally a universal joint bolted at its opposite ends to the adjacent ends of the rails, whereby the ends of the sections may be adjusted at any angle and afford a continuous track, substantially as herein set forth.

2. The buckets having at opposite ends the tongues and ears provided with perforations, and with a straight pin for hinging them together independent of the friction-wheels, said tongue and ears being capable of a slight vibratory or swinging motion in addition to the hinged motion, substantially as herein set forth.

3. The end of one bucket having a saddle centrally depressed and on the under side of the bucket near the saddle a set of ears with cross perforations, in combination with the adjacent bucket, the end of which has a trough which rests under the saddle aforementioned, and having on the under side of said trough a tongue having a perforation, and the ends of said trough having apertures to receive the hinge-rod, substantially as herein set forth.

4. The buckets hinged together at the ends, having below the hinged points suitable projecting lugs or studs, against which the points of the pulley or spider rest as the buckets are carried around said pulley, substantially as herein set forth.

5. The combination of the hinged buckets having at opposite ends the lugs or projections *e n*, with the bucket pulleys or spiders having the points Q, substantially as herein set forth.

6. The combination of the frames B C, the pulleys P, and the tracks or guideways E E′, with a train of buckets hinged, as described, and shaft H and pulley U^2, all as and for the purposes described.

7. In combination with the abutting ends of the rails of the adjacent sections of the track, the tie L, having a double joint, M, substantially as and for the purpose described.

8. In a conveyer, the combination of a track made flexible at the ends of the abutting sections of its rails, combined with ball-and-socket joints located at convenient distances along the track, whereby the track can be moved in any direction for use.

9. The independent conveyer-sections having at the united ends the ball-and-socket hinged joint K and the centrally hinged spliced plates L, with the train of conveyer-buckets hinged together, so that said buckets are capable of limited side play to correspond with the direction of the sections when extended in any other direction than a straight line, substantially as herein set forth.

10. In a dredging-machine having a track for rollers which support an endless chain of buckets, a track made in section and a jointed section or tie provided with joints or hinges acting both ways, said hinged sections or ties sliding on the rails, whereby the track may be expanded and contracted, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand, this 8th day of May, 1885, in the presence of witnesses.

THOMAS Z. COLE.

Witnesses:

EMILE C. JEUNESSE,

B. A. RODRIGUEZ.