(No Model.) 3 Sheets—Sheet 1.

J. MENGE.

DREDGING MACHINE.

No. 288,091. Patented Nov. 6, 1883.

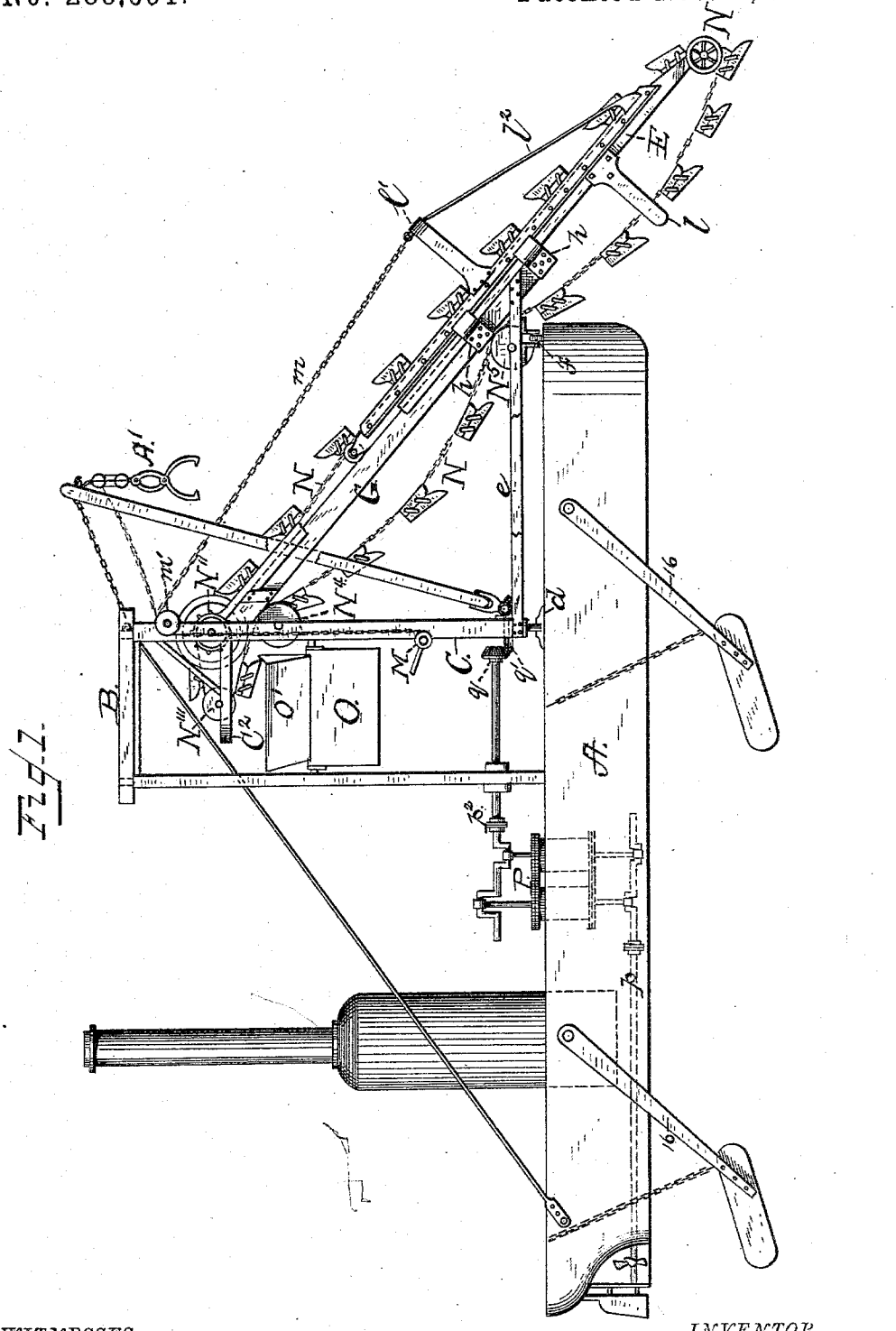


Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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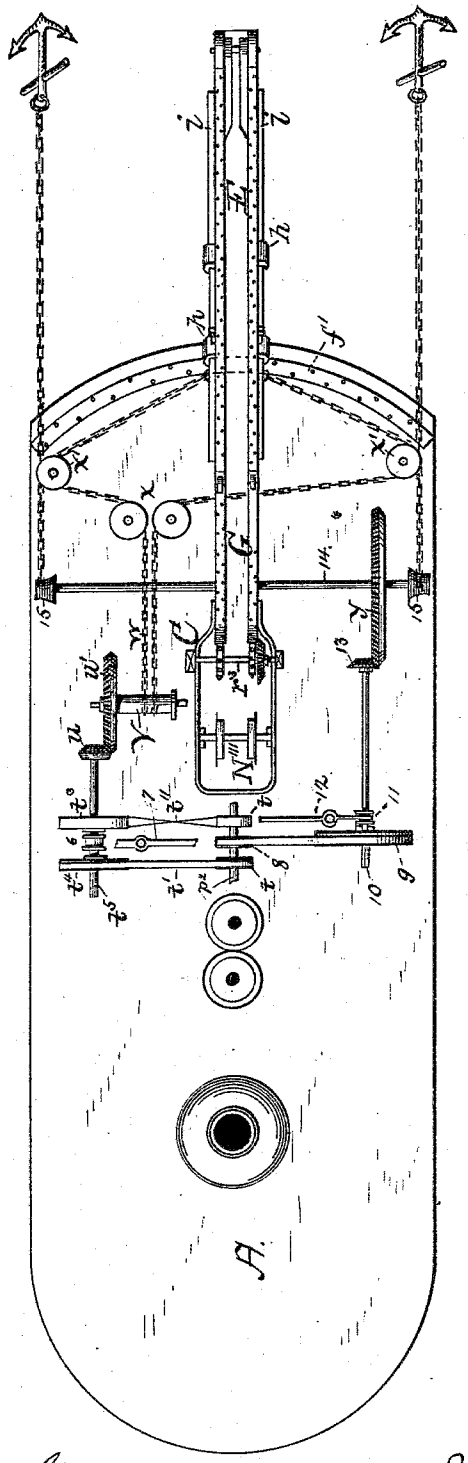


Fig. 6.

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(No Model.) 3 Sheets—Sheet 3.

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Fig. 3.

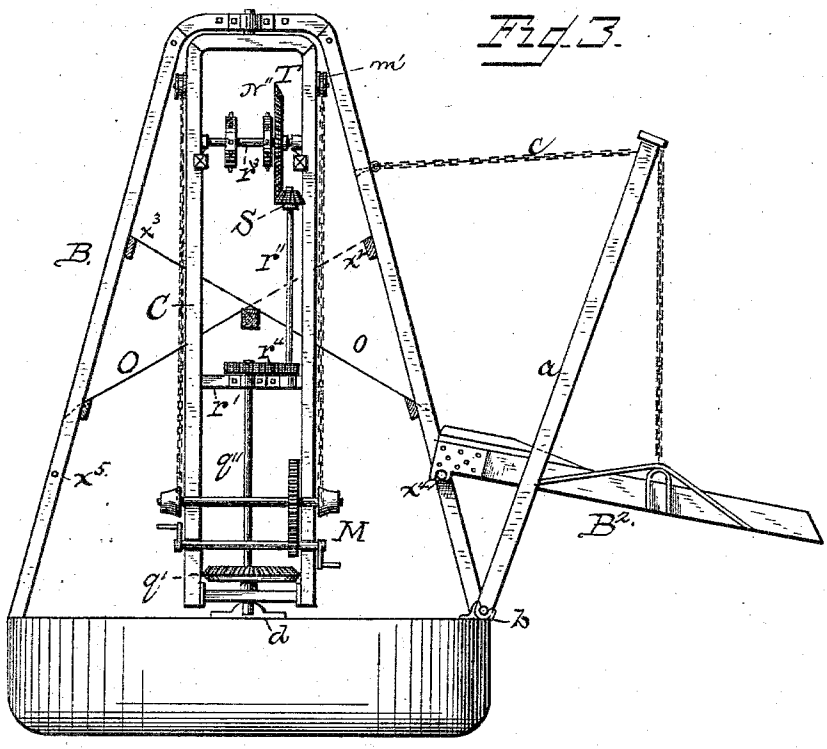


Fig. 4.

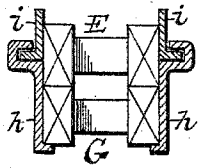
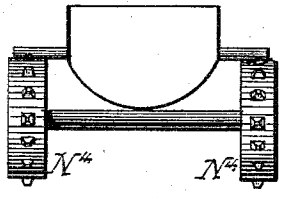


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH MENGE, OF NEW ORLEANS, LOUISIANA.

DREDGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 288,091, dated November 6, 1883.

Application filed April 2, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH MENGE, a citizen of the United States of America, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Dredging-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in steam dredging-machines of that class employing an endless train of buckets working in a frame suspended from a swinging frame, in connection with mechanism for shifting the combined frames to either the right or left side of the dredge-boat for widening the cut of the canal or ditch; and the objects of the improvements under consideration are in the main to improve and increase the efficiency of these machines.

With these and other objects in view my invention consists in the novel combination and construction of parts, as will be hereinafter more fully set forth.

In the annexed drawings, Figure 1 is a side elevation of a dredge-boat provided with my improved machinery. Fig. 2 is a plan or top view thereof. Fig. 3 is an end view of the boat. In each of these figures portions of the machinery are omitted, so as to show the other portions more clearly. Fig. 4 is a cross-section of the two parts of the swinging frame, with the side guides thereof. Fig. 5 is a view showing the passage of buckets between idlers.

The letter A represents the hull of a boat of sufficient capacity to carry the machinery, on the deck of which is erected a frame, B, having a journal-bearing in the top thereof, to receive the upper pivot of a swinging frame, C, and the lower end of this last is provided with a similar pivot that is fitted in a step, *d*, which is secured to the deck of the boat for the same purpose.

The swinging frame C, which is of a suitable size and strength, is made with an open center for operating mechanism, and at or near its base is provided with the forward-extended pieces or spars *e*, and these are provided on their lower sides with supporting-rollers *f*, for operating on a curved track, as shown at *f'* in Fig. 2.

From the upper end of the swinging frame is suspended a frame composed of two or more sections for carrying the endless chains and buckets. The upper section, G, of this frame, now termed "bucket-frame," consists of two side pieces of timber or other material, which have their lower ends firmly secured to the projecting pieces or spars *e* of the frame C. On the outer sides of these pieces or beams G are secured metallic guide-plates *h*, having recesses in which the side flanges, *i*, of the lower movable section, E, also composed of two pieces, operate.

The sides of the lower section of the frame are provided with downward-projecting side plates, *l*, for preventing the bucket-chains from running off their guide-wheels when the boat is listed to the side, and the upper side of the section is provided with a metal arch, *l'*, with connection from the top of same to the lower ends of the frame, as at l^2, serving as bracing means, and from this arch chains *m* are carried upward to a pair of sheaves, *m'*, journaled in the sides of the swinging frame, and thence downward to a windlass, M, located near the base of the frame, by means of which the lower section of the bucket-frame can be raised, whenever necessary, and likewise lowered.

The sprocket-chains N, to which the buckets are attached, pass over sprocket-wheels N', the shaft of which is journaled in the lower end of the adjustable section E of the bucket-frame, thence over wheels N'', with their shaft journaled in bearings near the top of the swinging frame C, and thence rearward around idlers N''', which have bearings in the rear projection, C^2, of the said frame. The object of passing the buckets around the idlers is to discharge their contents onto a slide or chute, O, arranged immediately below, as shown.

In the swinging frame C and the side spars, *e*, are fitted bearings, in which are journaled the shafts carrying the idlers N^4N^5, over which the bucket-chains pass. These idlers are made sufficiently large to permit the buckets to pass without coming in contact with the shafts thereof, as better seen in Fig. 5 of the drawings.

Motion is imparted to the sprocket-chains,

with the connected buckets, from a single or double cylinder engine, P, having piston-rods extending through each head of the cylinders, so that the lower ends of said rods may be connected with the propeller-shaft p of the boat, and the upper ends in like manner connected with a main shaft, p^2, that has secured at one end thereof a pinion, q, for gearing into a bevel-wheel, q', which is secured to the lower end of a vertical shaft, q'', that has a pivotal bearing in the lower part of the frame C, and a journal-bearing in a piece, r', connecting the sides of the aforesaid frame, as shown in Fig. 3. In the piece r' is also journaled the lower end of a second vertical shaft, r'', the upper end of which is provided with a pinion, S, the teeth of which engage those of a bevel-wheel, T, that is keyed or otherwise secured to the transverse shaft r^3, located near the upper end of the frame C. The lower end of the shaft r'' is connected by gear-wheels with the shaft q'', as shown at r^4 in Fig. 3. The swinging frame, with the attached bucket-frame, is moved to the right or left, as the nature of the work may require, by power obtained from the engine-shaft p^2, (see Fig. 2,) through pulleys t t, that are keyed thereon, so as to connect, by a belt, t', and cross-belt t'', with a second set of pulleys, t^3 t^4, that are loosely fitted on a shaft, t^5, on which is also fitted a clutch, 6, that is operated by a lever, 7, so as to engage one or the other pulleys aforesaid and be put in operation thereby. The shaft t^5 is provided at one end with a pinion, u, which gears into a bevel-wheel, u', that is fitted on the windlass-shaft V. Around the drum of the latter is wound a chain or rope, w, the opposite ends of which pass around sheaves x and x', and are secured to the sides of the crane, as shown in Fig. 2.

In order that the boat may be held up to its work or drawn forward to the same independent of its propelling machinery, I provide the shaft p^2 with a third pulley, 8, from which I make a belt-connection with a pulley, 9, that is loosely fitted on a side shaft, 10, said pulley having a side clutch, which is engaged, when necessary, by a sliding clutch, 11, through the instrumentality of a lever, 12. The forward end of the shaft 10 is provided with a pinion, 13, which gears into a bevel-wheel, y, that is keyed or otherwise secured on a shaft, 14, having bearings across the top of the deck, and provided near its outer ends with drums 15, over which the anchor-chains are wound when the machinery last described has been set in motion, thereby drawing the boat forward toward the anchors, (previously placed ahead of the boat,) as shown in Fig. 2.

At the foot of the frame B, and on one or both sides of the boat, is connected by a universal or ball joint a boom, the upper end of which is swung by a chain from the upper part of the aforesaid frame, as shown in Fig. 1. From the upper end of this boom is suspended a block and tackle, A', for the removal of stumps and other obstructions which may be encountered during the operation of the boat.

At the top of the ridge which divides the starboard from the larboard chute O a gate or wing, O', (see Fig. 3,) is adjusted so as to rest upon the side bars, x^2 x^3, of the frame B, and thus direct the excavations to either the right or left of the boat, as may be desired.

The sides of the upright portion of the frame B are furnished with pins x^4 x^5, for supporting the inner end of an auxiliary chute, B^2, the outer end of which is supported at any desired elevation from the upper end of the boom a, having at its lowest end the ball-and-socket joint b, thus providing for the discharge of the excavations at a point somewhat beyond the side of the boat, so that an embankment or levee may be formed along the side or sides of the channel at the same time that the latter is being deepened.

Spars 16 are pivoted on each side of the boat, as shown in Fig. 1, so as to keep the boat from moving out of a direct course during the operation of dredging.

The "swinging frame" is so called because it has a pivotal bearing at the top and bottom, and is capable of being moved on these axes by suitable mechanism; and this swinging frame, in connection with the bucket-frame, is commonly termed a "swinging crane."

The advantages of making bucket-frame extensible, and of feeding the swinging crane from side to side for the purpose of widening the cut, is well known to civil-engineers, and the importance of my improvements to this class of machines will readily be understood and appreciated.

I reserve the right to vary the construction and arrangement of parts without departing from the spirit of the invention.

I am aware that it is not broadly new to combine with a swinging frame sprocket or chain wheels, driving-gear, and an endless chain, the latter being provided with dredging-buckets; hence I make no broad claim to such a combination.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a dredging-machine, the combination of an extensible bucket-frame and a swinging frame, substantially as and for the purpose set forth.

2. In a dredging-machine, the combination of an extensible bucket-frame and a swinging frame with the side spars extending forward and connecting firmly the bucket-frame at an intermediate point, whereby the upper and lower parts of the upper section of the bucket-frame are connected to the swinging frame, substantially as described.

3. In a dredging-machine, a swinging frame having lower projecting pieces or spars, e, with rollers f, in combination with the extensible bucket-frame and shifting mechanism, as described, and for the purpose set forth.

4. In a dredging-machine, a bucket-frame composed of two parts, G E, the former pro-

vided with guide-plates *h*, and the latter with side flanges, *i*, for operating in recesses in the said plates *h*, as described, and for the purpose specified.

5. In a dredging-machine, the combination of an endless chain having buckets attached thereto, and a swinging frame having chain-wheels and driving-gear mounted therein, side spars secured at their rear ends to the swinging frame, chains X, pulleys *x' x'*, and windlass, substantially as described.

6. In a dredging-machine, the combination, with a bucket-frame composed of sections, of the means for raising the lower section, the same consisting of the arch *l'*, lower connection, l^2, chains *m*, sheaves *m'*, and windlass M, as described and specified.

7. In a dredging-machine, a swinging frame with suspended bucket-frame carrying a train of buckets, provided with a vertical shaft, *q''*, arranged between the side pieces of the frame, with a bevel-wheel, *q'*, on the lower end gearing into a pinion, *q*, on the end of the main shaft *p''*, from which it obtains motion, in combination with connecting gearing r^4, vertical shaft r^2, and connected gearing driving the bucket-chain, substantially as described.

8. In combination with the swinging bucket-frame of a dredging-machine and of the engine-shaft thereof, the arrangement of pulleys *t* t^2 t^3 t^4, belts *t' t''*, shafts t^5 and V, coupling 6, and lever 7, gear-wheels *u* and *u'*, with chains *w*, and sheaves *x* and *x'*, all arranged to operate as described, and for the purpose set forth.

9. The herein-described means for keeping the boat up to its work independently of its propelling machinery, the same consisting of the side shaft, 10, and cross-shaft 14, the two connected by bevel-gears 13 and *y*, the former shaft connected by a band with a pulley, 8, secured on the shaft *p''*, and furnished with a coupling, 11, that is thrown in or out of gear by a lever, 12, and the drums 15 on the ends of the shaft 14, around which the anchor-chains are wound, for the purpose set forth.

10. The combination, with the deck having the upright frame secured thereon near one end thereof, a swinging frame secured under and between the said upright frame, a bucket-frame, and endless chain having buckets secured thereon adapted to move with the swinging frame, of the train consisting of the transverse shaft r^3, vertical shaft *r''*, vertical shaft *q''*, with intermediate connection and horizontal shaft *p''*, the said shafts being provided with gear-wheels adapted to mesh and operate the endless chains carrying the buckets, substantially as set forth.

11. In a dredging-machine, the combination of a swinging frame having chain-wheels and driving-gearing mounted therein, a bucket-frame composed of adjustable or telescopic sections, and an endless chain having buckets attached thereto, with operating feed mechanism, substantially as described.

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

JOSEPH MENGE. [L. S.]

Witnesses:
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P. A. ORY.