

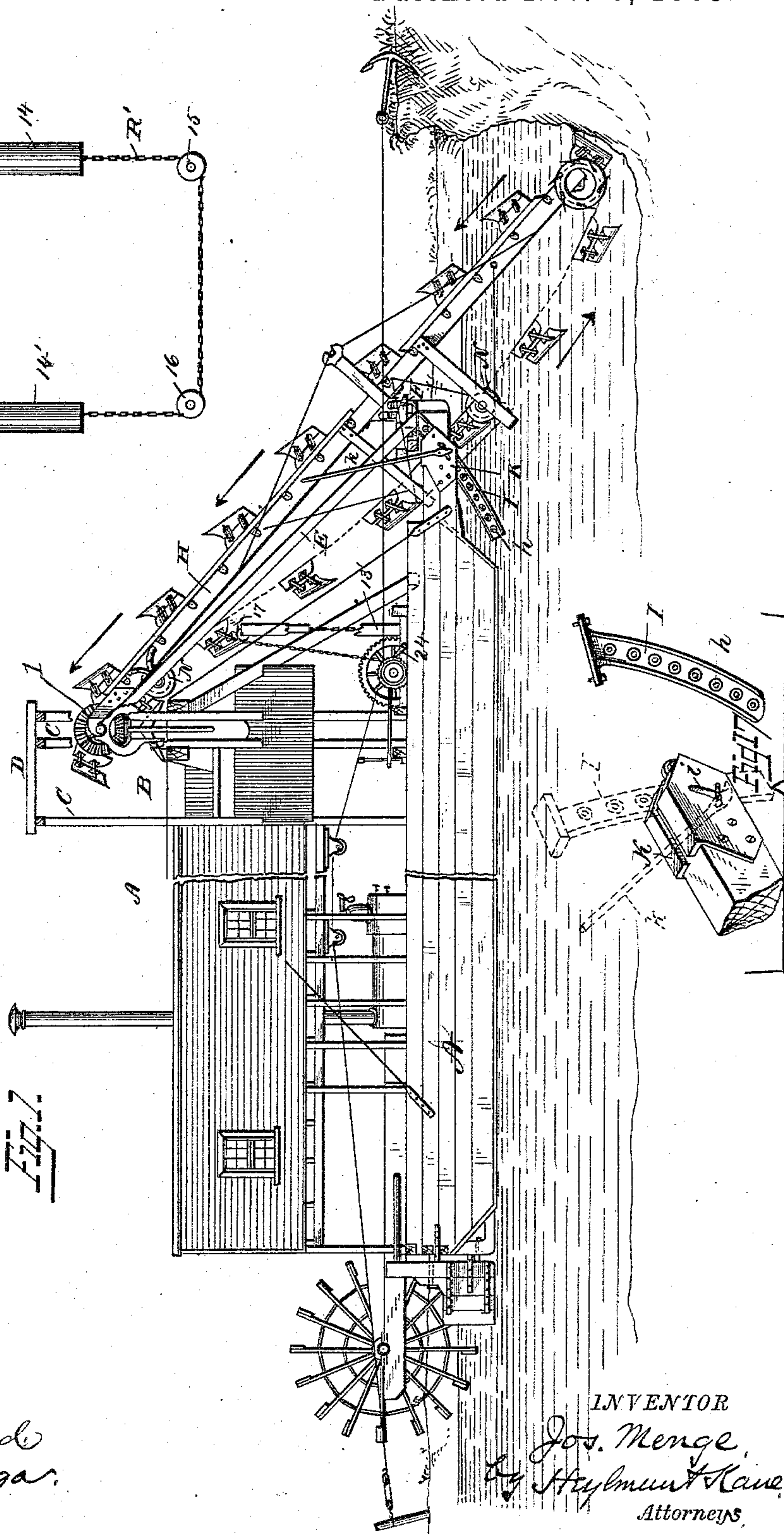
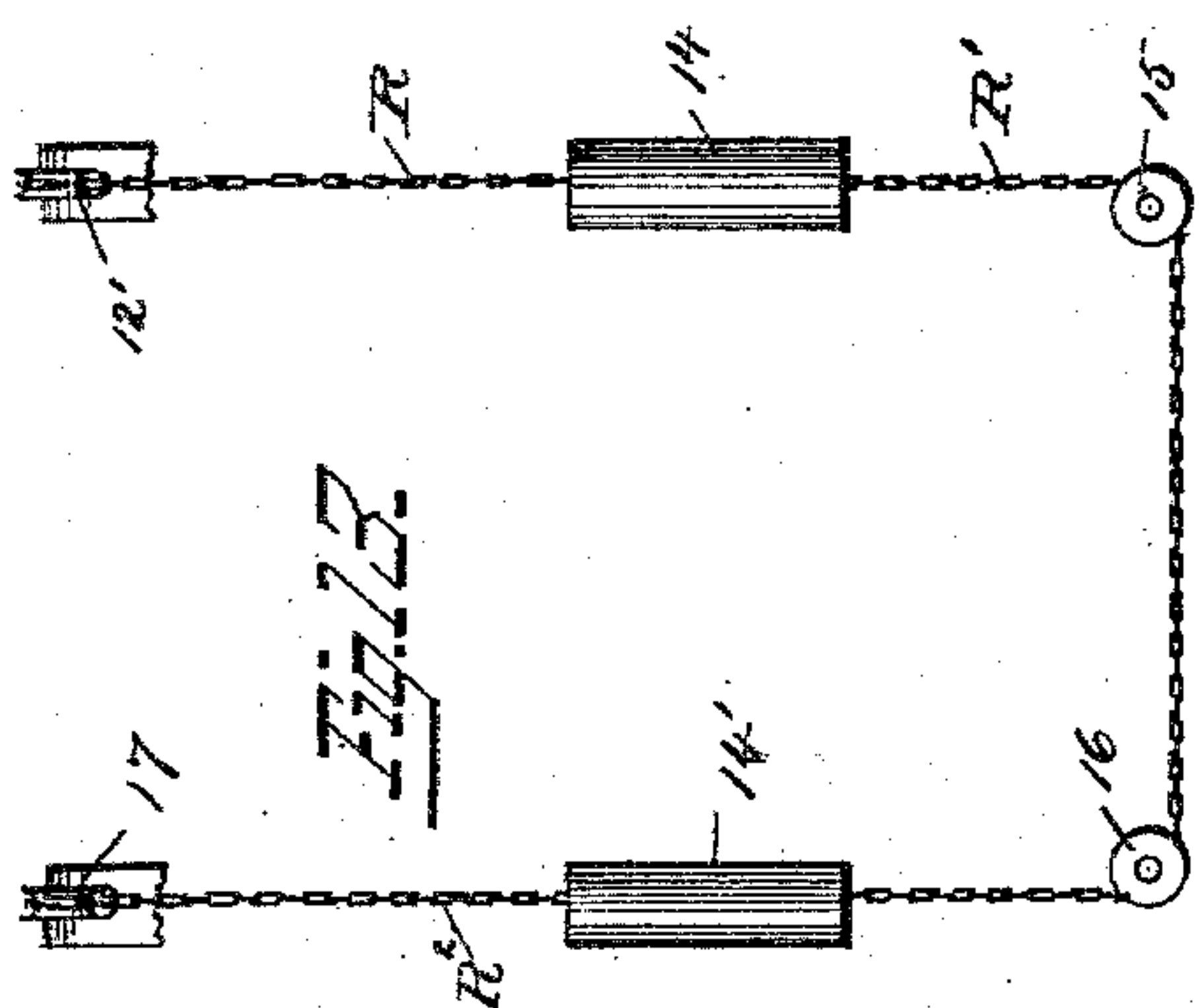
(No Model.)

6 Sheets—Sheet 1.

J. MENGE.
DREDGING MACHINE.

No. 288,093.

Patented Nov. 6, 1883.



WITNESSES
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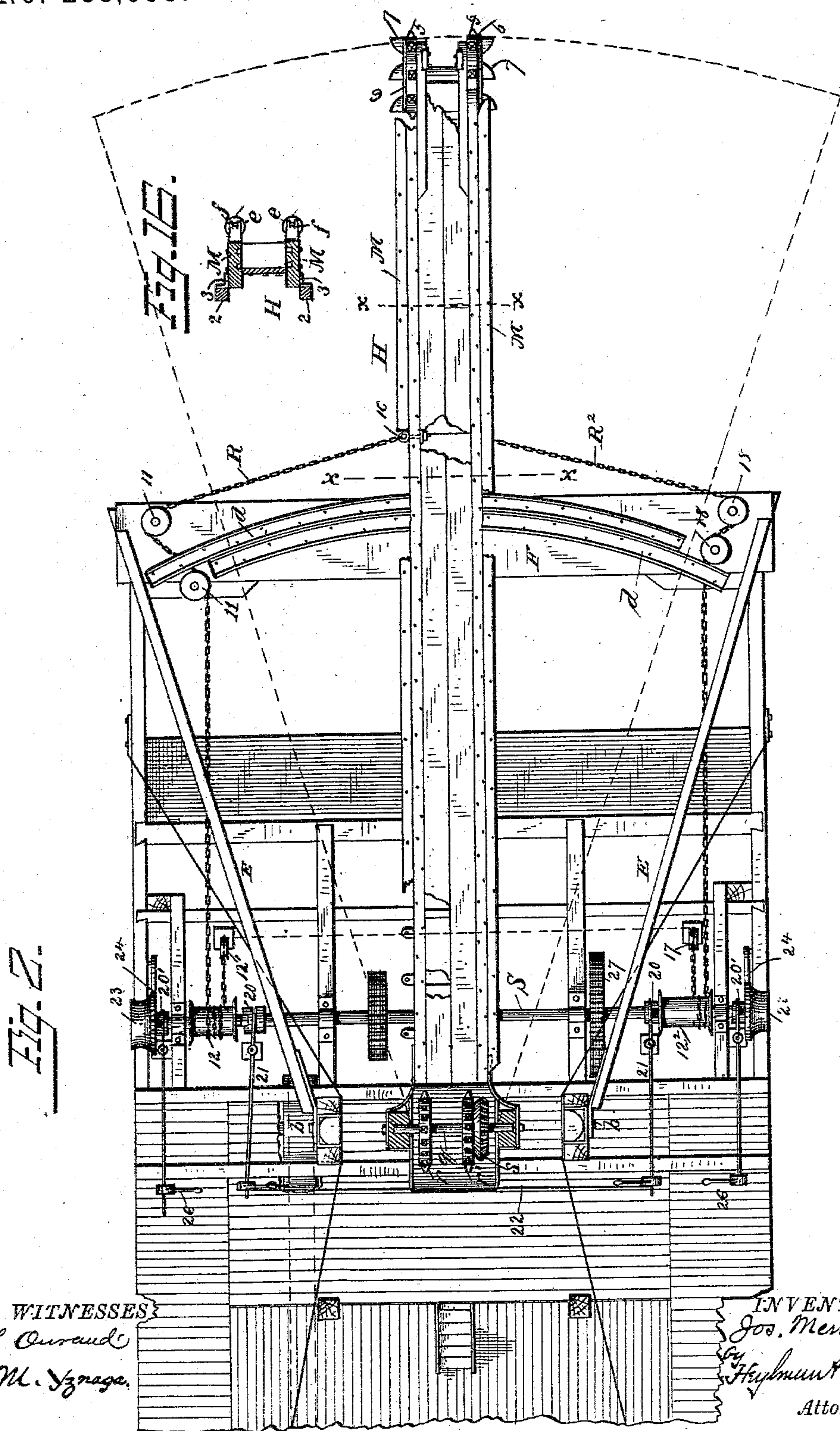
(No Model.)

6 Sheets—Sheet 2.

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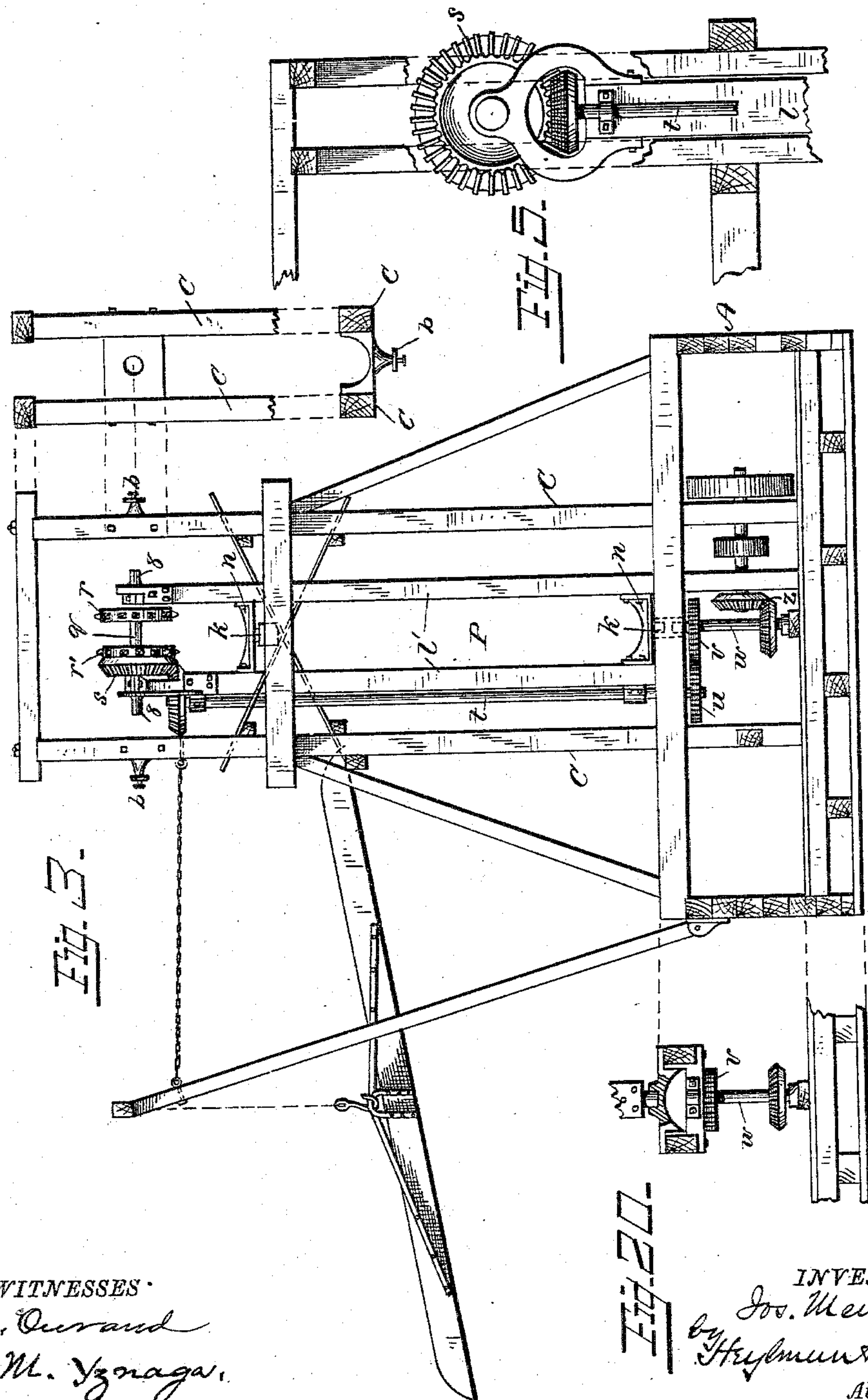
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6 Sheets—Sheet 3.

J. MENGE.
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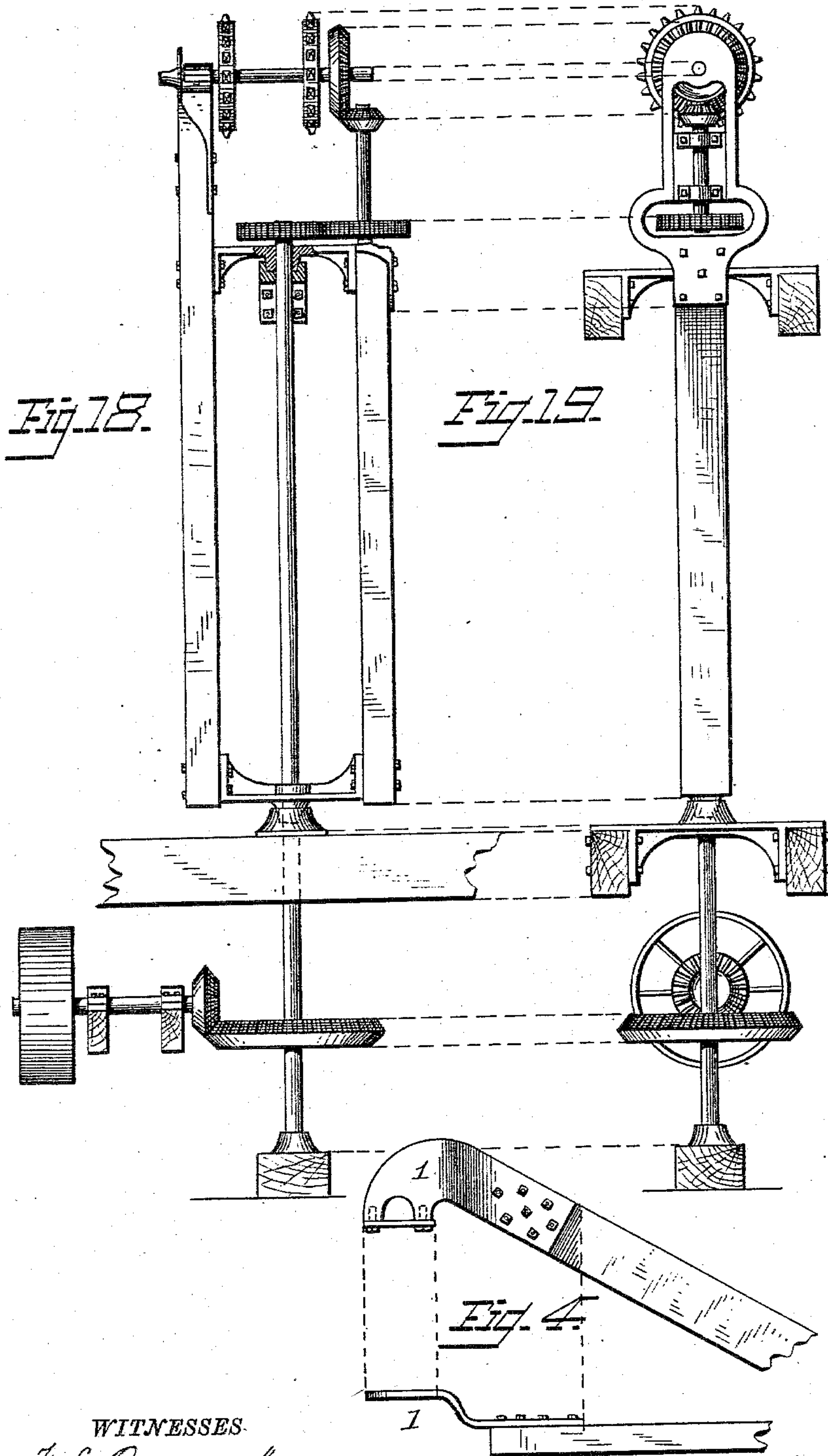
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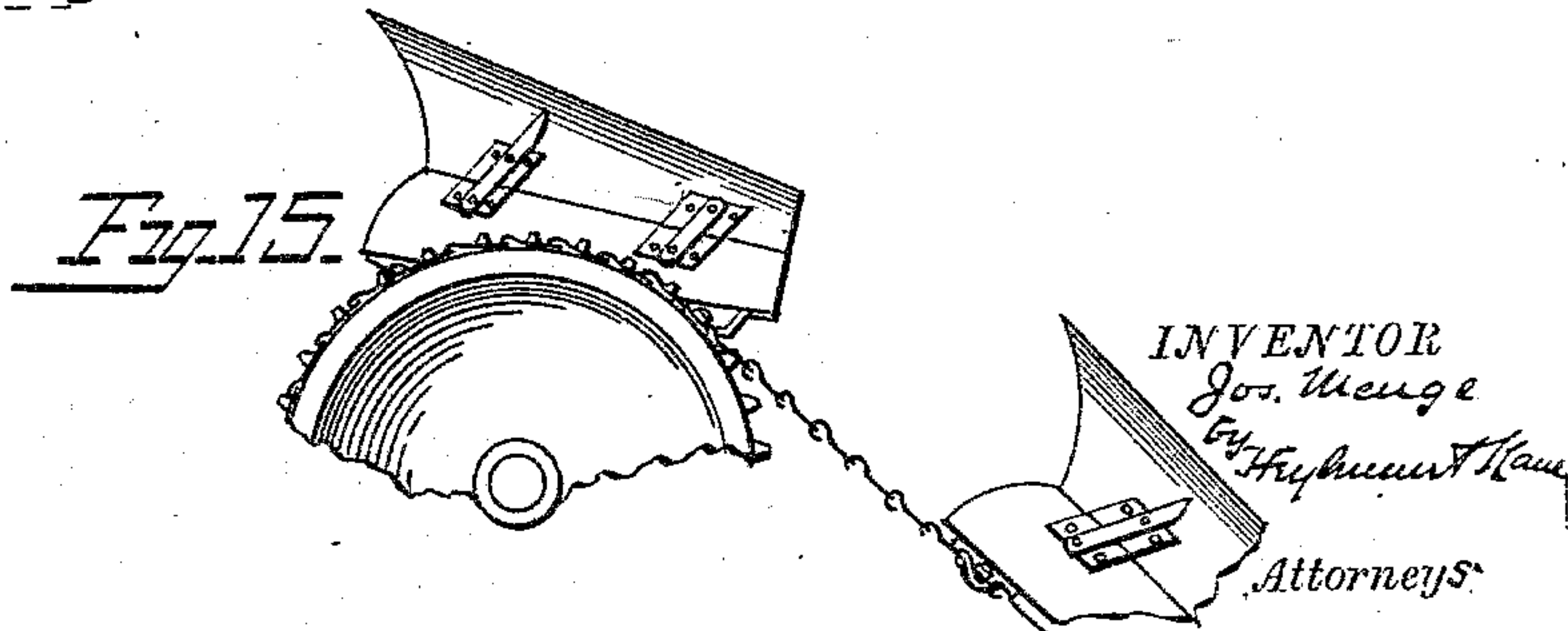
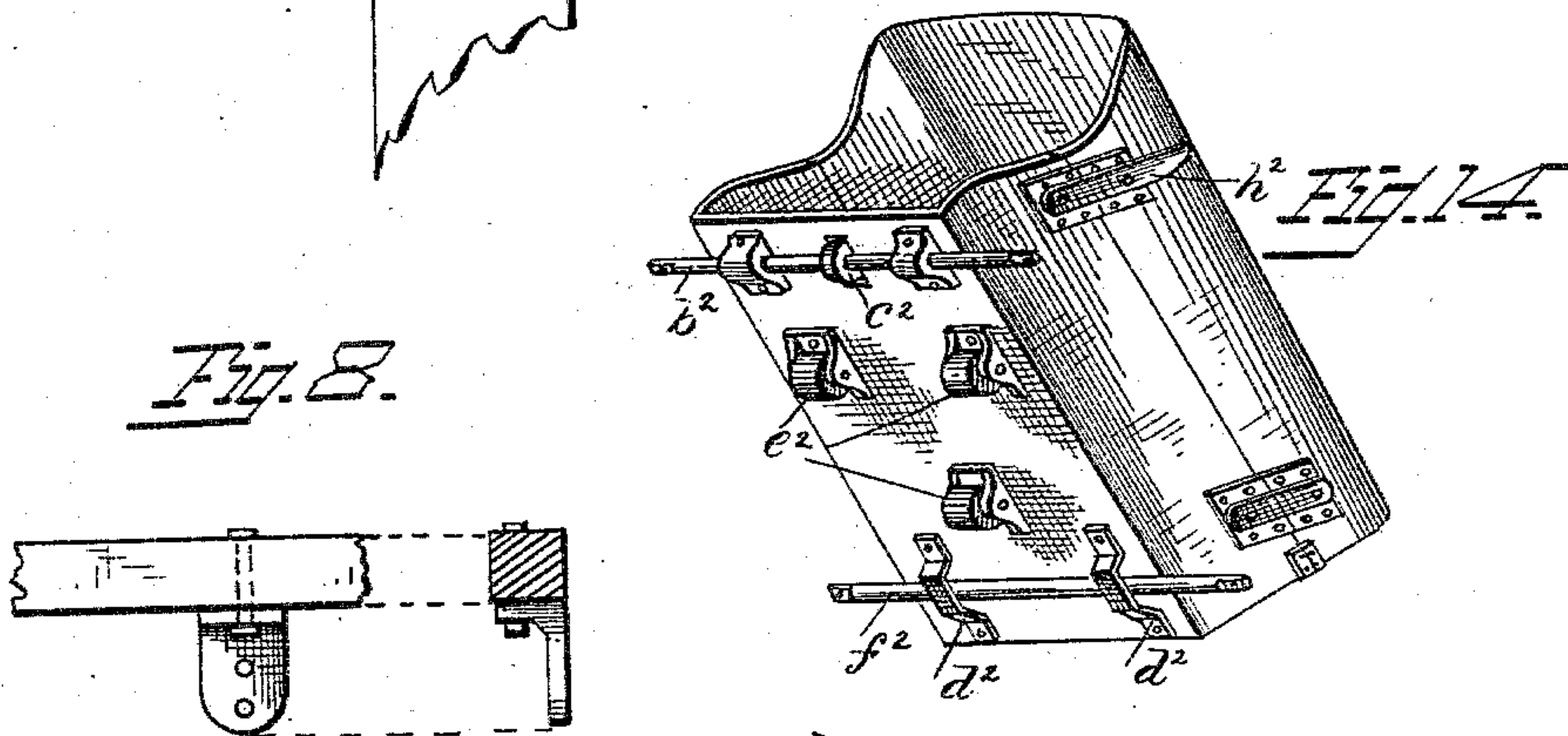
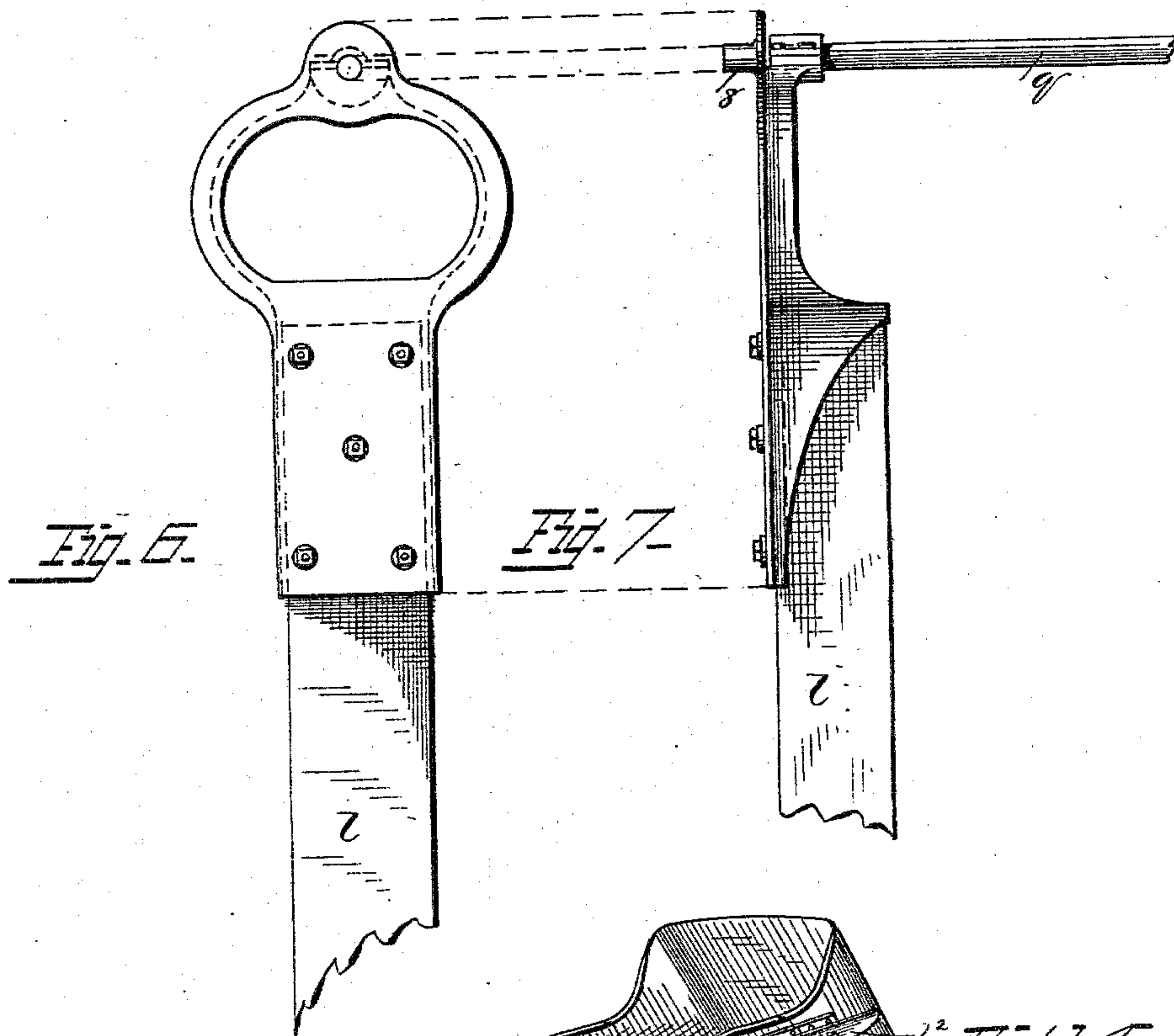
(No Model.)

6 Sheets—Sheet 5.

J. MENGE.
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No. 288,093.

Patented Nov. 6, 1883.



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(No Model.)

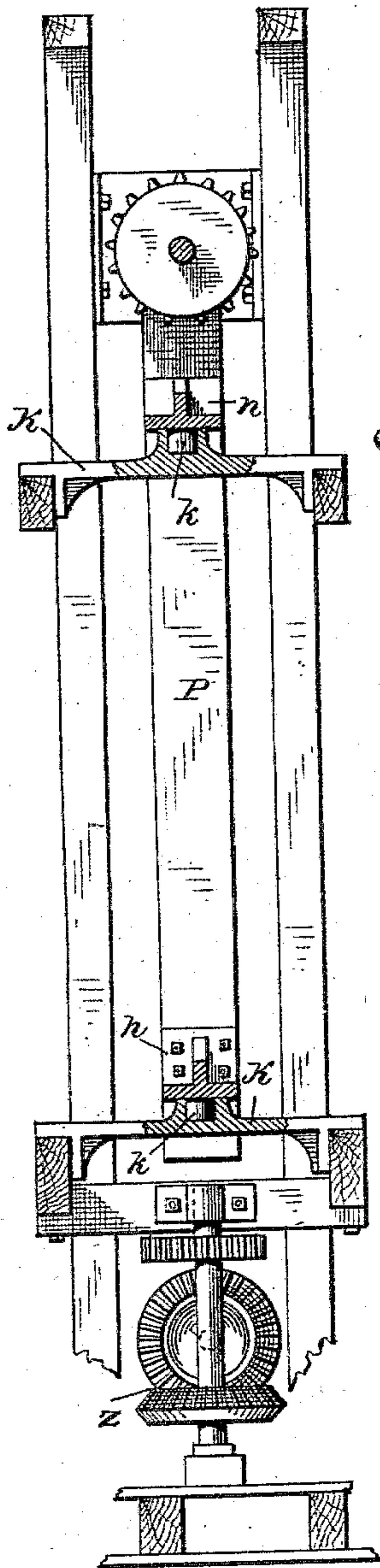
6 Sheets—Sheet 6.

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Fig. 9.



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Fig. 12.

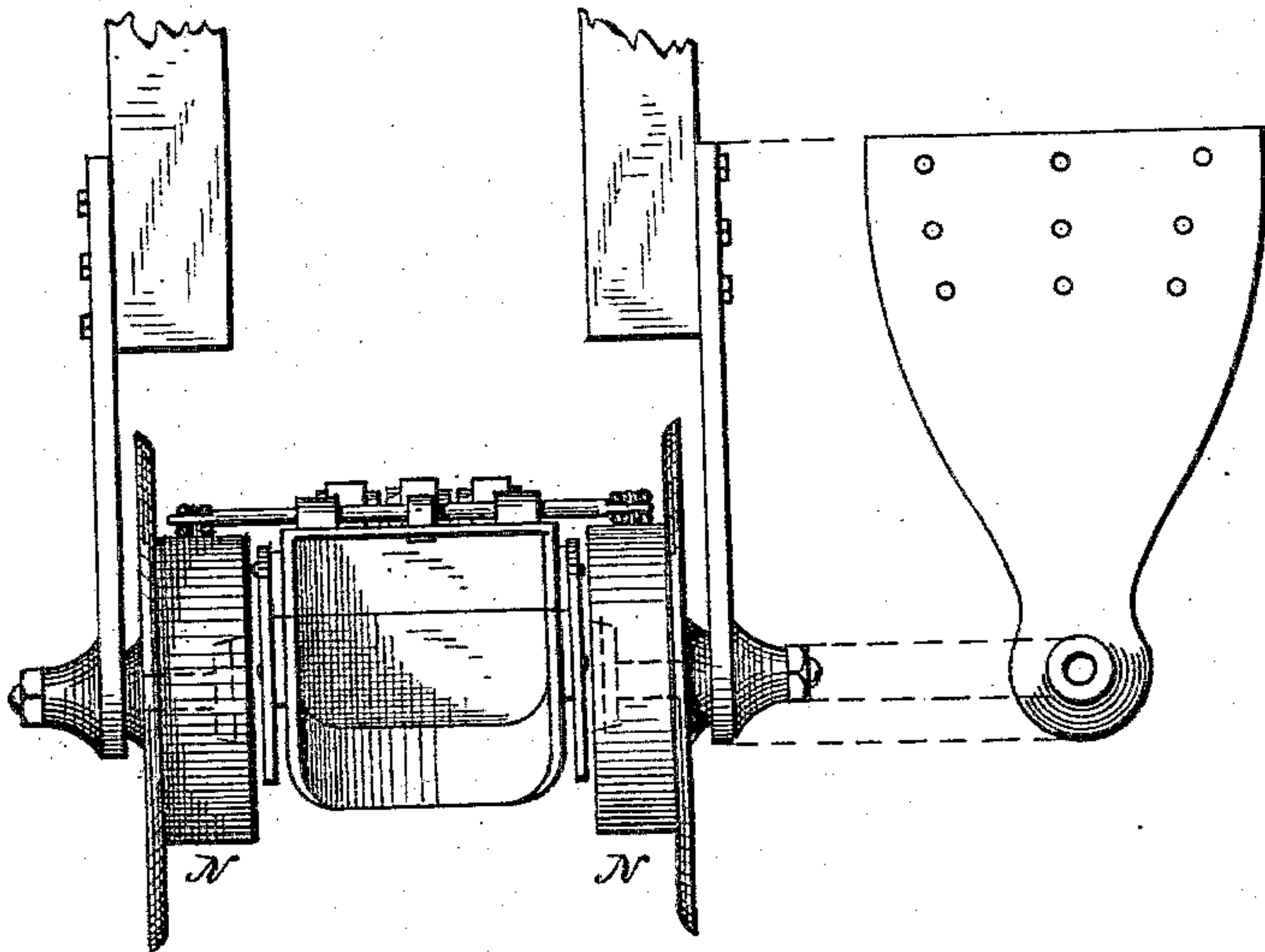


Fig. 11.

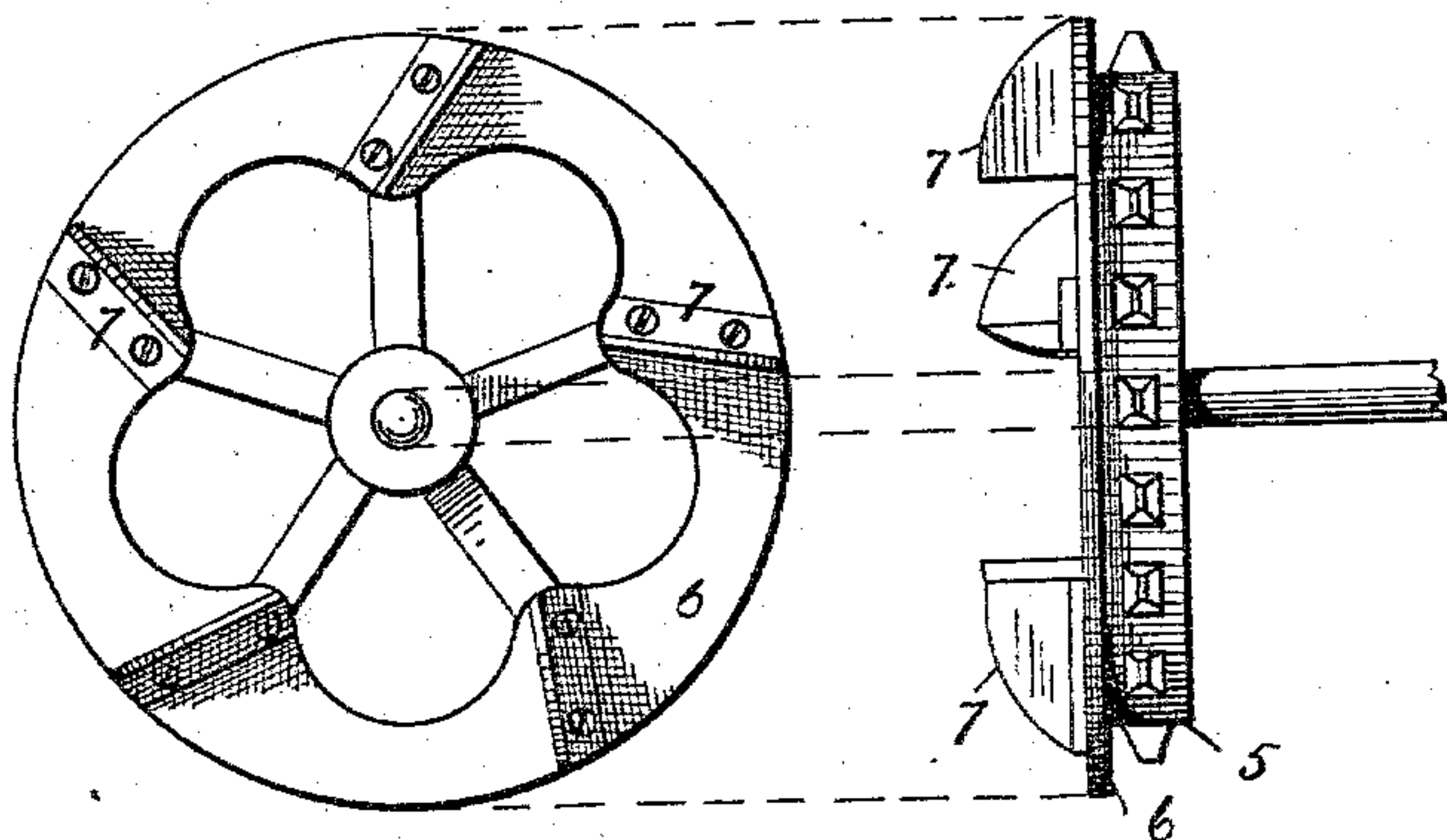
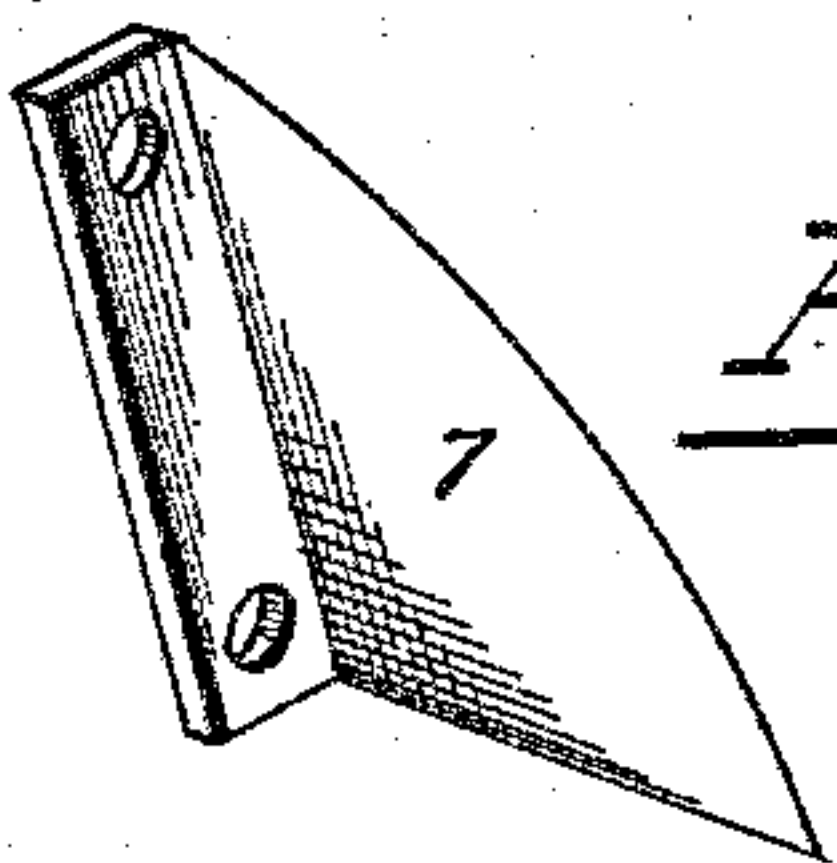


Fig. 10.



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UNITED STATES PATENT OFFICE.

JOSEPH MENGE, OF NEW ORLEANS, LOUISIANA.

DREDGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 288,093, dated November 6, 1883.

Application filed January 16, 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 now known as the "Menge dredge;" and it has for its object to provide novel means for elevating or lowering the table that supports the forward portion of the bucket-frame, carrying a succession of scoop-buckets on endless chains, so that a deep or shallow cut can be made; also, to provide novel means for swinging the pivoted frame with a bucket-frame carrying the elevating-buckets to the work; also, to provide novel mechanism for operating an endless train of buckets secured to a bucket-frame which is hinged to a swinging frame, and to simplify the general construction of the machine.

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

In the annexed drawings, Figure 1 is a side view of my improved dredging-machine, broken away in the middle, as indicated by the broken lines. Fig. 2 is a plan view of the front portion of the dredger. Fig. 3 is a transverse section, showing the swinging frame with its operating mechanism and side chute. Fig. 4 shows views of the bucket-frame hinges. Figs. 5, 6, and 7 are views of the side-bar castings. Fig. 8 is a view of bracket-castings attached to side bars of the bucket-frame. Fig. 9 is a sectional view of the swinging frame. Figs. 10 and 11 are views of the side cutters attached to flanges of lower tumbler-wheels. Fig. 12 is a view of the ends of side beams with the oppositely-arranged idlers, showing the passage of the bucket-chains over the idlers and the bucket between. Fig. 13 is a view of the tension-chain with weights passing under the end

rollers. Figs. 14 and 15 are views of the improved sectional bucket. Fig. 16 is an enlarged transverse sectional view of the bucket-frame, taken through the lines *x x* of Fig. 2. Fig. 17 is an enlarged view of the members I and K. Figs. 18 and 19 are front and side views, showing modifications of the swinging frame; and Fig. 20 is another view of the gearing *w v*, shown in Fig. 3.

In Fig. 1 of the accompanying drawings, A represents a dredging-vessel equipped with the usual steam-boiler, steam-engine, propeller, and their adjuncts for propelling the vessel and operating the dredging apparatus. Near the front end of this vessel, in rear of the bucket-frame table or support, is erected the frame B, composed, preferably, of the six vertical posts, C, and the top cross-beams, D, with or without strengthening-braces.

Between the upper ends of the front pair of vertical posts, C, (see Figs. 2 and 3,) are arranged castings provided or formed with pivots *b*, serving as axes for the upper ends of the diagonal side beams, E, of the table. The lower ends of these diagonally-arranged side beams, E, are firmly secured to the ends of a table or support, F, arranged at the front end of the vessel, and when the table is adjusted the beams move therewith. This table or support F is constructed on its upper surface with two curved tracks, *d*, which conform substantially to the pitch or inclination of the bucket-frame H, over which tracks travel the anti-friction rollers *e*, journaled in the brackets *f*, secured to the under side of the bucket-frame. The opposite ends of this table or support are provided with pendent sector-bars I, having a plurality of transverse holes or openings *h*, and these sector-bars (only one shown in Fig. 1) pass downward through recessed castings K, secured to projecting side gunwales of the vessel.

The casting K is formed with a curved slot, *i*, for the passage and engagement of the pin that passes through a slot and a hole in segment, and this pin rests on the end of the lever *l*, as indicated in Figs. 1 and 17 of the drawings. To raise the table or support to elevate the inclination of the bucket-frame working upon centers at its upper end, a strong metal pin is inserted transversely through the per-

foration immediately above the casting on each side of the boat, and these oppositely-arranged pins will sustain the table while the pins of the levers are being disengaged and adjusted to other lower holes in the sector-bars, and by pulling the levers downward the engaged sector-bars, with the attached table, are raised the distance of one space. If further elevation is desired, the operation of shifting the metal pins to new holes and adjusting the lever-pins for new engagement is repeated.

It is obvious to those skilled in the art that other means—for example, sector-racks and pinions with dog-pawls—may be employed for adjusting the table and the inclination of the bucket-frame. The object of these adjusting means is to elevate or lower the train of buckets, so as to dig deeper or shallower.

The bucket-frame H consists of two guide-beams, M, with metal hinges 1 at their upper ends, the side bars or chain-guides 2, cast-iron brackets 3, and railway-tracks for the anti-friction rollers of the buckets, as shown in Figs. 1, 2, 4, and 16 of the drawings. The lower end of this frame is provided with a transverse shaft, upon which are properly arranged and keyed the tumbler or sprocket-chain wheels 5, to the arms of which are bolted side flanges, 6, with the side cutters, 7. This frame, at or near its middle as to length, is strengthened in a suitable manner by brace bars and rods, to afford the necessary support to the train of buckets and their loads when at work. By bracing the frame substantially as indicated, much lighter timbers can be employed and a lighter frame used. At suitable points of this frame, on the under side, but attached to the sides, are journaled in suitable hangers the idlers N, between and over which pass the train of buckets and endless chains, as shown in Figs. 1 and 12 of the drawings. These idlers, working on the short bearings of the hangers, prevent the chains and buckets from sagging on their descent, and give a higher point of discharge.

The letter P represents the swinging frame turning on the pivot-bearings k above and below, as shown. This frame consists of two uprights, l l' , with metal cap-plates, one of which is provided with an opening for the passage and operation of a bevel-gear, hereinafter described, and the intermediate connecting-castings n , with the pivots adapted to work in the steps of the castings K of the frame B. To the upper end of this swinging frame is mounted in journal-boxes a transverse shaft, q , upon which are keyed the sprocket-chain wheels r r' , properly separated, and the bevel-gear s , keyed to shaft and bolted to sprocket-wheel r' , as shown in Figs. 2 and 3 of the drawings. These cap-plates are formed with side bearings, 8, which form bearing-centers for the side beams of the bucket-frame. Attached to this frame, so as to swing therewith, is a vertical shaft, t , having at its upper end a bevel-pinion, to engage with the bevel-gear s on the shaft q , and at its lower end a gear, u , to re-

ceive motion from the pinion v on the short vertical shaft w , through the bevel-gearing z and the motor power of the stationary engine in the boat. Of course where the shaft t passes through the deck a passage will be formed for the movement of the shaft with the swinging frame.

Passing over and around the sprocket-chain wheels of the swinging frame and the sprocket-chain wheels at the lower end of the bucket-frame are the endless sprocket-chains, carrying a succession of scoop-buckets, substantially as seen in Fig. 1 of the drawings, and, motion being communicated to the upper sprocket-chain wheels through the instrumentality of the shafting and gearing, the buckets are caused to descend, scoop the earth, and ascend loaded, to be automatically unloaded as they turn to descend. The contents of the buckets as emptied fall on a hinged adjustable chute arranged on the side of the vessel at a proper angle, as seen in Fig. 3, for freely sliding off the material to the side bank of the canal.

The bucket shown in Fig. 14 of the annexed drawings, known as the "sectional bucket," is preferred in connection with this machine, although any other style of a scoop-bucket can be used. The bottom or flat side of this bucket is provided with three anti-friction rollers, e^2 , which run on the railway-tracks of the bucket-frame, for materially lessening the frictional contact and permitting the bucket to ascend with ease; the collar c^2 , welded to cross-bar b^2 , for confining the bucket in the center between the chains, and the loops d^2 , secured to the lower ends of the bucket, to permit play for the cross-bar f^2 to move forward with the chains in going over the sprocket-wheels. After the bucket has passed over the said wheels, the chains will become straightened and the bar will return to its normal position. The upper side link-straps, h^2 , are extended forward, with cutting-surfaces, for the purpose of loosening the soil for the following buckets.

The letter R represents the chain for swinging or shifting the bucket-frame with the buckets and the connected swinging frame to either the right or left side, as indicated by the arrows and dotted lines in Fig. 2 of the drawings. One end of the chains is firmly attached to the side of the bucket-frame at 10; thence it extends rearwardly around the grooved rollers 11; thence in a direct line rearwardly to the windlass 12, and around the same two or more times; thence extends forward and upward over a grooved pulley, 12', (better seen in Fig. 1,) and down a vertical casing or tube, 13, containing a weight, 14, which is connected to the chain. Another section of a chain, R' , is connected to the under side or bottom of the weight 14, and continues its passage downward through the vertical casing 13 and under a grooved roller, 15, (see Fig. 13,) located under the floor of the vessel; thence extending across, as indicated

by dotted lines in Fig. 2 and full lines in Fig. 13, and under a grooved roller, 16, making a connection with another weight, 14', located in the vertical casing or tube 13', (see Fig. 1.)
 5 arranged directly opposite on the other side of the vessel. Another section of a chain, R², is connected to the upper end of the weight 14', and continues upward through its casing and over the grooved pulleys 17; thence rear-
 10 ward to the windlass 12², and around the same two or more times; thence forward in a direct line to and around the grooved pulleys 18, and finally to the bucket-frame opposite 10—the point of beginning—where a firm connection is made. This mechanism for feeding the
 15 combined bucket-frame and swinging frame—termed commonly a "swinging crane"—from side to side for widening the cut of the canal or stream is principally, aside from the feed, to equalize the tension and guard against break-
 20 ing the chains by the yielding of the connected chains and their adjuncts when the crane comes in contact with any obstructions in the swing or feed, and to prevent the crane, when
 25 the boat is listed, from running of its own accord to that side, but only allow it to travel at its required speed.

Loosely mounted on the shaft S, and secured between collars on one side and pillow-blocks
 30 on the other, are the windlasses 12 and 12', and the clutches 20, moving on feather-keys of the shaft. These clutches are shifted into and out of clutch connection with the windlasses by compound levers 21, connected together by
 35 the transverse rod 22, and, thus connected, the lever attendant can, at either side of the boat, operate the feed of the swinging crane to the new work, and this connection of the levers prevents both clutches from being thrown into
 40 gear at the same time—to wit, when the right-hand windlass is thrown into clutch the left-hand windlass is thrown out of clutch.

To the outer ends of the shaft S are fitted, loosely, between collars, the drums 23, to receive the draw and pay-off ropes in the usual
 45 way for guiding and advancing the machine, and the tension of the ropes is maintained by the ratchet-wheel and dog-pawl 24. These drums are constructed with clutch-faces, to engage with the movable clutches 20', actuated
 50 by the compound levers 26.

When the machine is at work, the shaft S has a continuous motion through the medium of a gear, 27, keyed thereon, meshing with a
 55 driving-pinion below in communication with the source of power. The stationary steam-engine with its adjuncts is so located in the vessel as to operate either the propeller or stern-wheel when the vessel is traveling, or
 60 the dredging apparatus when at work.

I reserve the right to provide a car with these improvements for land-excavations, ditches, railway-passages, and the like, and either the car or the dredge can be equipped,
 65 if desired, with conveying belts or trucks for carrying and dumping the elevated earth to the sides thereof, or into a side scow or car, as

desired. I also reserve the right to change the construction and arrangement of the parts within the scope of the invention, and use rope 70 or its equivalent in lieu of the chains; and therefore I wish it distinctly understood that I do not confine myself to the exact construction and arrangement of parts shown and described.

What I claim as my invention, and desire 75 to secure by Letters Patent, is—

1. In a dredging-machine, the combination, with a movable table supporting a bucket-frame, of sector racks and levers engaging and co-operating therewith for elevating or lower- 80 ing the table, substantially as described.

2. In a dredging-machine, the combination, with a movable table supporting a bucket-frame, of perforated sectors, levers with pins to engage with the perforations of the sectors, 85 and removable and adjustable pins, for the purposes stated.

3. In a dredging-machine, the combination, with a movable table supporting a bucket-frame, of the perforated sector-bars attached 90 to the ends of the table, slotted castings attached to the sides of the vessel, and the co-operating levers with the removable and adjustable pins, substantially as and for the purposes set forth.

4. In a dredging-machine, the combination, with a swinging bucket-frame, of side feeding mechanism with an equalizing tension, and means to obviate breaking the chains when the crane comes in contact with any obstruc- 95 tions in the swing, substantially as described.

5. In a dredging-machine, the combination, with a swinging bucket-frame, of the feed-chains attached, preferably, to the sides of the bucket-frame, and passing over and around 105 pulleys suitably arranged both above and below the floor of the dredger, and provided with weights arranged at suitable intermediate points between the chain ends, substantially as described.

6. In a dredging-machine, the combination of a bucket-frame connected to a swinging frame, the feed-chain, with interposed weights, suitably-arranged pulleys over and around 110 which the chain passes, windlasses, clutches, and shifting clutch-levers, with operating mechanism, substantially as and for the purposes set forth.

7. In a dredging-machine, a swinging frame consisting of uprights, one of which is provided with metal cap having an opening for the passage and operation of a bevel-gear, an upper transverse shaft carrying sprocket-chain wheels and a bevel-gear, and a vertical shaft journaled to the side of the frame, which has 120 an opening at the upper end, and provided with a bevel-pinion to mesh with the bevel-gear on the transverse shaft, and having at its lower end a gear to mesh with pinion mounted on a vertical shaft situated directly under the 125 center line of pivoted frame, substantially as described.

8. In a dredging-frame, the vertical posts C, with the interposed castings provided or

formed with pivots *b*, in combination with the side beams, E, and table or support F, substantially as and for the purpose set forth.

5 9. A bucket-frame for a dredging-machine, consisting, essentially, of the side beams, M, with the metal hinges 1 at the upper end, side bars or chain-guides, 2, and cast-iron brackets 3, with or without the bracing, substantially as described.

10 10. A bucket-frame for a dredging-machine, consisting, essentially, of the side beams, M, with the hinge ends, side bars, 2, cast-iron brackets 3, and bracket *f*, with the anti-friction rollers, substantially as described.

15 11. A bucket-frame for a dredging-machine, consisting of the side beams, M, with the hinge ends, side bars, 2, cast-iron brackets 3, brackets *f*, with anti-friction rollers, and the idlers, substantially as described.

20 12. A bucket for a dredging-machine, having on its flat side a plurality of unflanged

rollers, in combination with a flat runway upon the bucket-frame for lessening the frictional contact and permitting the bucket to ascend with ease, substantially as described. 25

13. A bucket for a dredging-machine, having the upper side links extending forward and formed with cutting-edges, substantially as described.

14. The improved sectional bucket for a dredging-machine, provided with a plurality of anti-friction rollers, the upper side links formed with cutters, and the loops for the play of the transverse chain-bar, substantially as described. 30

In testimony whereof I affix my signature in presence of two witnesses. 35

JOSEPH MENGE.

Witnesses:

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W. O. HART.