

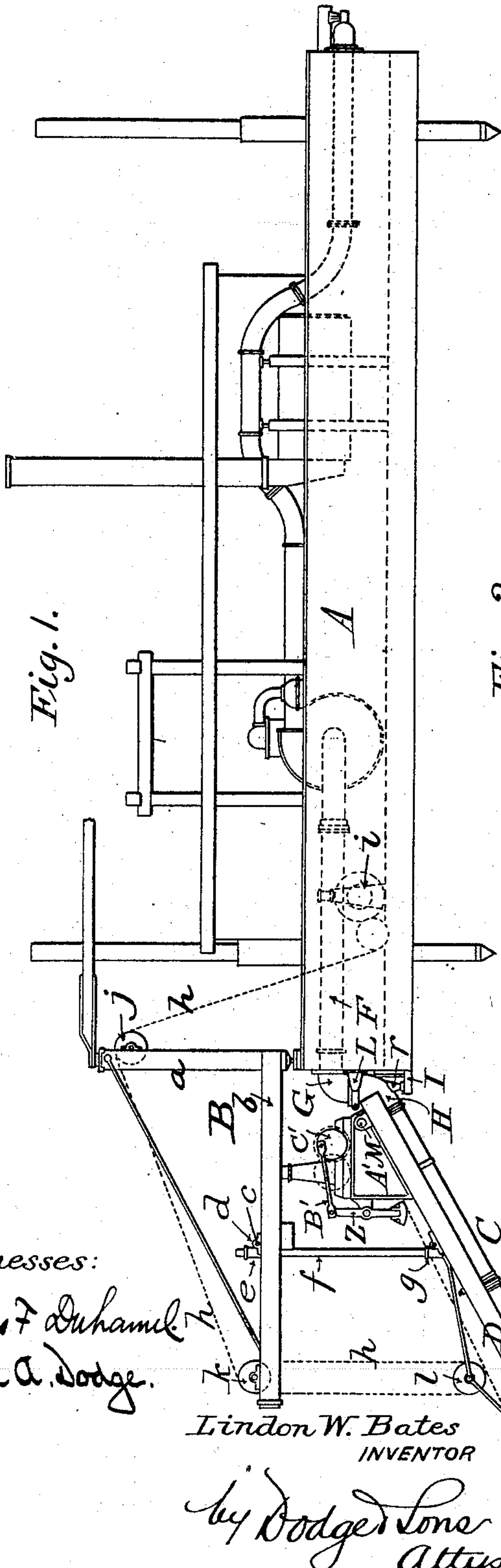
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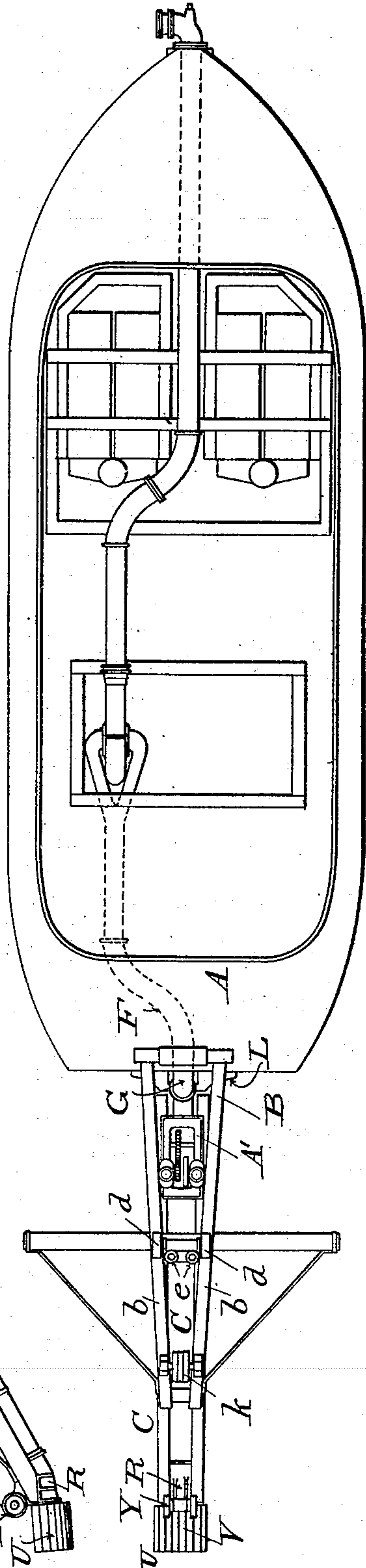
L. W. BATES.  
DREDGER.

No. 503,733.

Patented Aug. 22, 1893.



*Fig. 2.*



Witnesses:

*James F. Duhamel*  
*Horace A. Dodge.*

*Lindon W. Bates*  
INVENTOR

*by Dodge & Sons*  
Attys.

(No Model.)

L. W. BATES.  
DREDGER.

3 Sheets—Sheet 2.

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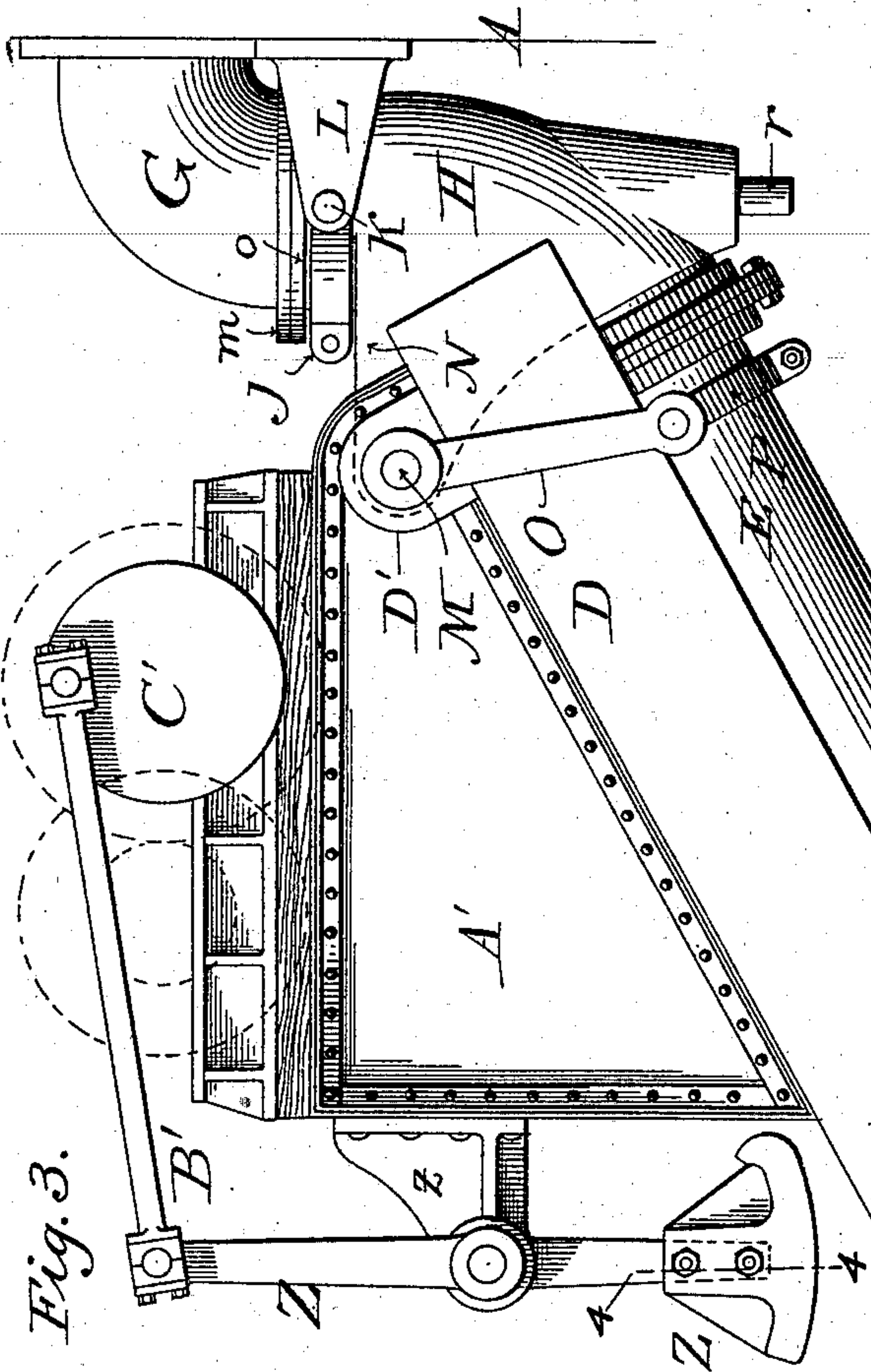


Fig. 3.

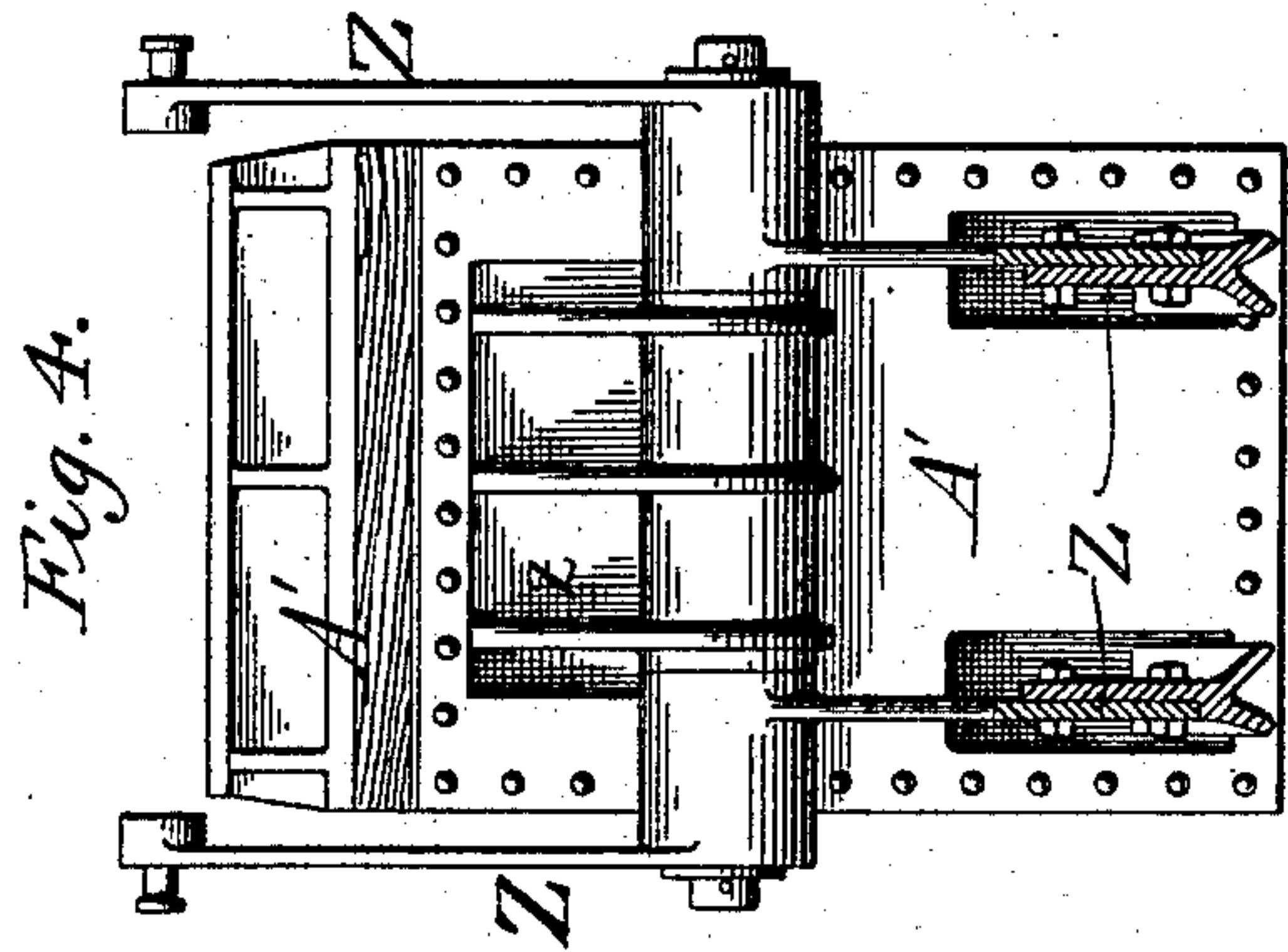


Fig. 4.

Witnesses:  
James F. Duhamel  
Horace A. Dodge.

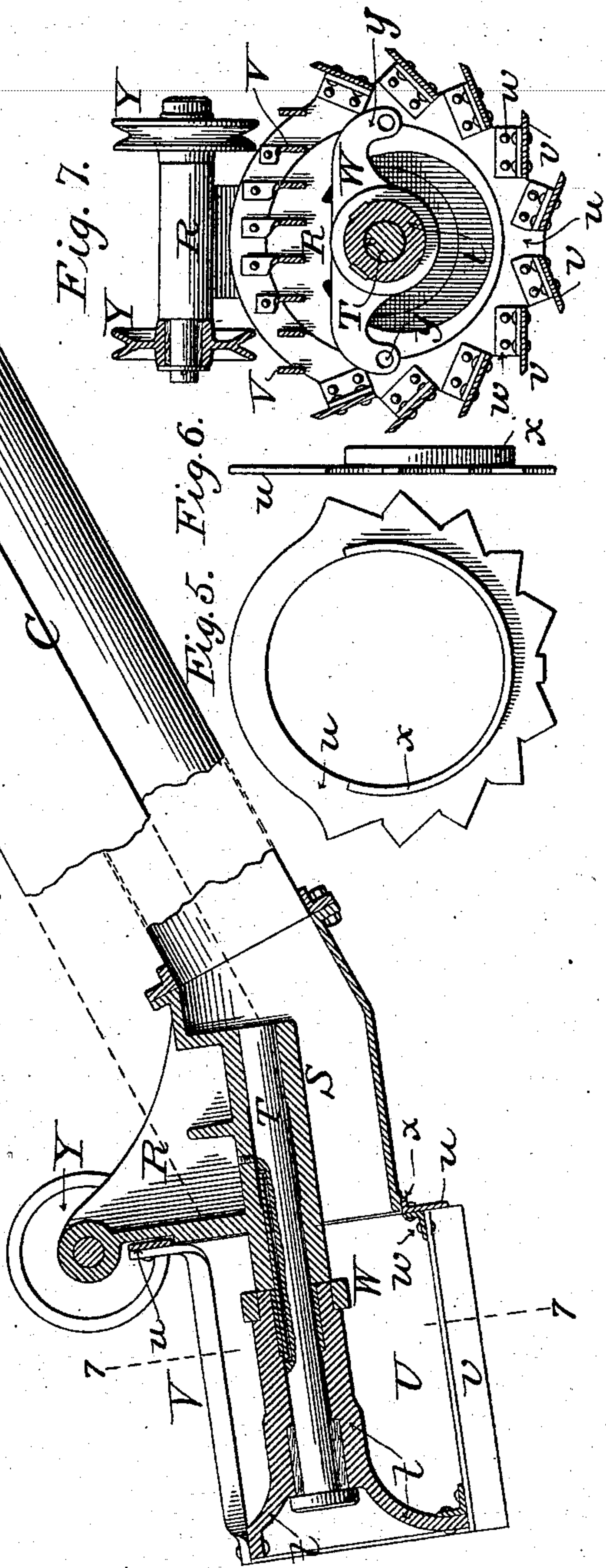


Fig. 7.

Fig. 5. Fig. 6.

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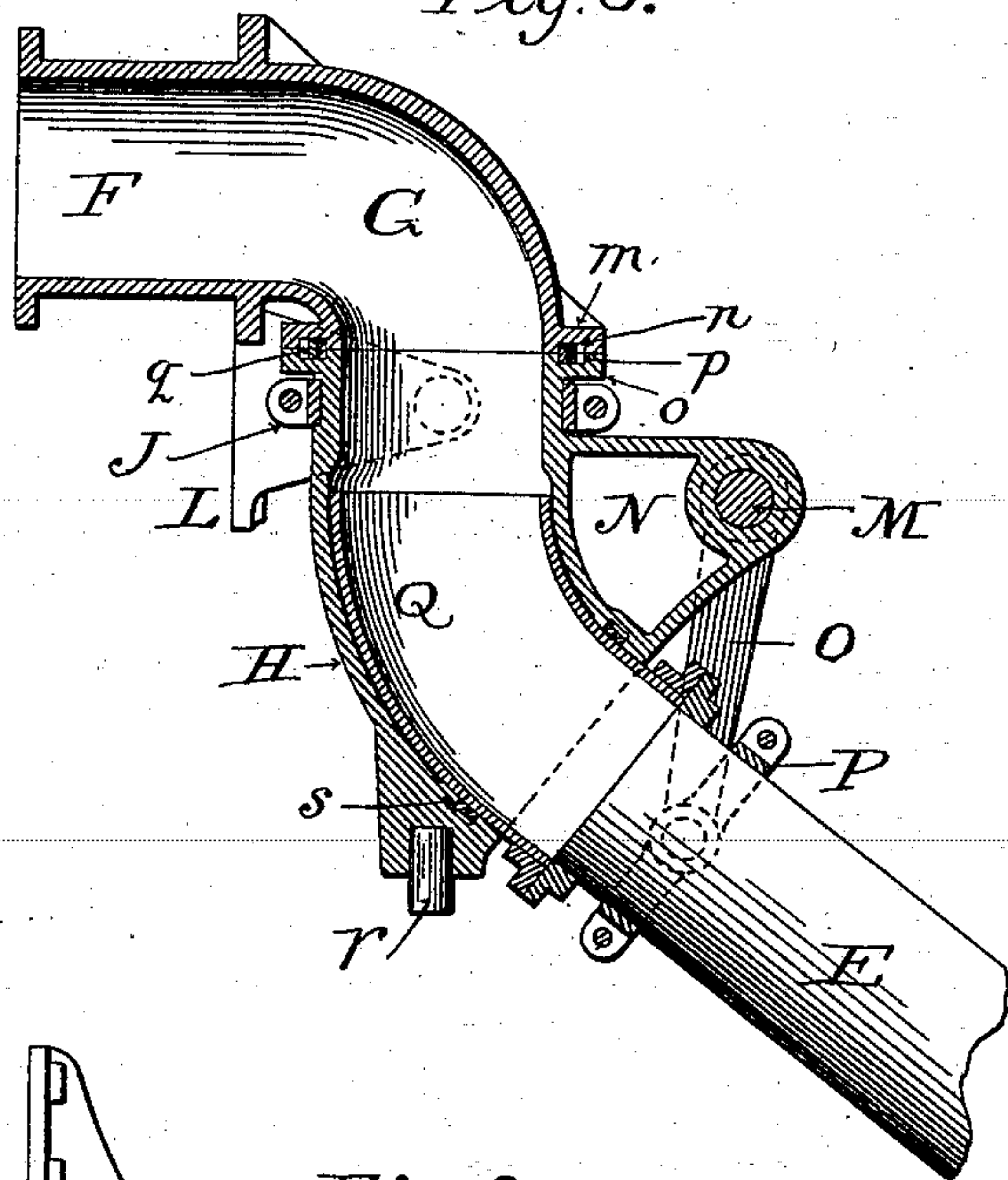
L. W. BATES.  
DREDGER.

3 Sheets—Sheet 3.

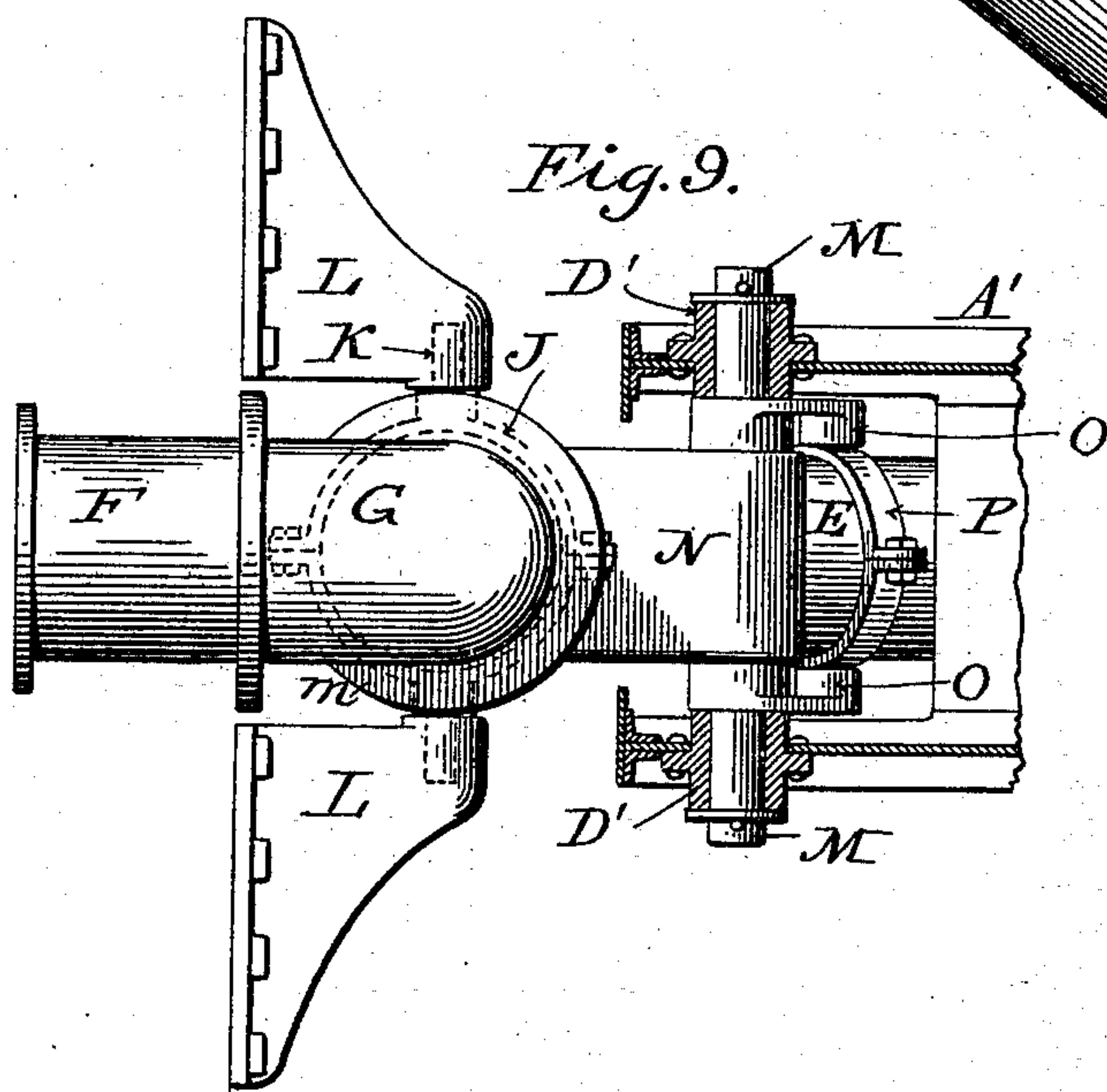
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*Fig. 8.*



*Fig. 9.*



Witnesses:

James F. Duhamel  
Horace A. Dodge.

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# UNITED STATES PATENT OFFICE.

LINDON W. BATES, OF CHICAGO, ILLINOIS.

## DREDGER.

SPECIFICATION forming part of Letters Patent No. 503,733, dated August 22, 1893.

Application filed September 21, 1892. Serial No. 446,443. (No model.)

*To all whom it may concern:*

Be it known that I, LINDON W. BATES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Dredgers, of which the following is a specification.

My invention relates to dredging machines, and consists of various features, details, and combinations hereinafter set forth and claimed.

In the drawings, Figure 1 is a side view of a dredger provided with my improvements; Fig. 2 a top plan view of the same; Fig. 3 a side view partly in section of the pivoted suction-pipe, cutter, and attendant parts; Fig. 4 a vertical sectional view on the line 4—4, Fig. 3; Figs. 5, 6, and 7, views illustrating the construction of the cutter, Fig. 7 being a transverse sectional view on the line 7—7 of Fig. 3; and Figs. 8 and 9, respectively sectional and plan views of the joint or connection between the boat and the pivoted suction-pipe.

A indicates the dredge boat which may be of most any desired construction, and which will of course be provided with the necessary engines and boilers and other mechanisms, as is usual. Upon the deck, at one end is a derrick B comprising the vertical post *a*, and the horizontal arm *b*; the said derrick being suitably braced and arranged to swing or turn upon an axis coincident with that of the upright post. Extending across the timbers forming the arm *b*, is a shaft *c* carried in suitable bearings *d* and provided with one or more sleeves or sockets *e* designed to receive stay rods *f* projecting from suitable sockets *g* mounted upon the ladder C in the same manner essentially as the sockets *e* are mounted upon the arm of the derrick. The object of these rods *f* is to prevent the latter from swinging laterally out of line with, or independently of, the derrick. By mounting the sockets upon shafts as shown, they are permitted to rock or tip slightly so as to allow the rods to adjust themselves, as the ladder is raised and lowered. To raise and lower the ladder, I employ a rope or cable *h* and an engine *i*, (see Fig. 1;) the cable passing from the engine, to a sheave *j* at the upper end of

the derrick post, thence to a sheave *k* at the end of arm *b*, and finally about a sheave or pulley *l* carried by the ladder. By placing suitable marks or graduations upon the rod or rods *f*, the depth to which the ladder is submerged may be readily and accurately determined.

The ladder may be variously constructed, but in the present instance I have shown it as comprising two longitudinal timbers D D arranged substantially parallel to each other and carrying between them the suction pipe E.

The suction pipe E is secured to the boat, and to the supply-pipe of the pump, by means of a compound joint or connection shown in Figs. 3, 8, and 9, which allows the said suction-pipe to swing laterally and also to be raised and lowered. Supply pipe F which conveys the material to the pump, is provided with a downwardly-turned neck or outer end G, the lower end of which is provided with a lateral flange *m* in the under side of which is formed a groove *n*.

H indicates a curved pipe or elbow whose upper end is provided with a flange *o* and groove *p*, the flanges fitting squarely against each other, and the grooves coinciding or coming into line to form a larger groove, one part of which shall be in the pipe G while the other part is in the pipe H, as clearly shown in Fig. 8. Suitable two part brass packing rings *q* seated in this large groove, form a water-tight joint between the two pipe sections G H while allowing the latter to turn relatively to the former upon the stem or axis *r* carried in the step or bearing I. Near its upper end, the pipe-section H is grooved circumferentially to receive a band or ring J, which is provided with lateral journals K carried in bearings or brackets L L,—which latter are bolted or otherwise rigidly secured to the boat. The band or ring J while holding the pipe-section H in proper position relatively to the pipe G, allows the former to turn upon a vertical axis coincident with the step bearing I.

Brackets L and studs or journals K are designed merely to support and steady the pipe but not to permit any oscillation of the latter upon such journals as this is prevented by the step-bearing I. Formed on the front side



of the elbow or pipe section H is a bracket N, in which is journaled a shaft M; said shaft being provided with radial depending arms O carrying at their lower ends a yoke, frame or band P. This yoke or frame P is pivotally mounted between and to the arms O, and is permanently secured to the suction pipe E, so that when the suction pipe is raised and lowered it will be supported at its upper end by the arms which swing from the shaft M as a center.

Secured to the upper end of the suction pipe E is a curved extension or elbow Q which fits within the curved elbow H,—both of said elbows or pipe sections being curved on the arc of a circle concentric with the shaft M, thereby forming a curved telescopic joint between the suction pipe and the pipe H. Suitable packing rings *s* are seated in a groove on the inside of pipe H and arranged to bear upon the suction-pipe so as to make a watertight joint.

At its opposite end, the suction pipe E is provided with a mouth piece or casting R which is formed or provided with an elongated collar or sleeve S to receive the cutter shaft T. This shaft or axle T is keyed or otherwise rigidly affixed in position in this sleeve, and carries at its forward end the oscillating cutter U,—the said cutter being free to turn upon the shaft, while prevented from moving endwise by being clamped between the head or enlargement on one end of the shaft, and the front end of the casting R as shown in Fig. 3. Cutter U is made up of a hub or body portion *t* to fit upon the shaft T, a disk or plate *u*, and a series of knives *v*. Half of the knives face one way (see Fig. 7) while the other half face in the opposite direction. They are provided with angle-irons *w*, which latter are secured, respectively, to the disk *u*, and the front end or flange of the hub or body portion *t*, as shown in Fig. 3. Disk or plate *u* is open at the center, and is provided with a lateral flange *x* on the rear face (Figs. 3, 5 and 6) which fits the curved under face of the mouth piece R. The cutter is further provided with a grate or grid which is formed by a series of bars V bolted or riveted at one end to the disk *u* and at the opposite end to the flared end of the hub or body *t*, as clearly shown in Figs. 3 and 7.

Keyed upon the hub *t* is a casting W having two laterally-extending arms *y y* designed to receive suitable cutter-actuating rods, ropes, or cables, X X, which pass from the ends of said arms,—to which they are secured,—up over suitable guide pulleys or sheaves Y Y carried in an upward extension of the casting R as shown in Figs. 3 and 7. These ropes, chains or cables pass from the sheaves Y up to a pair of rocker arms Z Z,—Figs. 1, 3 and 4,—which are journaled in a bracket *z* projecting from a bed frame or support A' mounted upon the ladder. Motion is imparted to the oscillating rocker arms Z by means of the pitmen B' which are secured

at one end to the rocker arms and at the other end to the crank wheel C' of the engine mounted on the frame A'. Of course when the rocker arms (to which the chains are connected) are oscillated alternately, they will, acting through the said chains or cables X, and arms *y y*, oscillate or rock the cutter, thereby causing the latter to loosen up the material as is well understood.

Upon reference to Figs. 1, 3, and 9 it will be noticed that the shaft or axle M, carried in the bracket N of pipe section H, projects through the side walls of the frame or support A',—the latter being provided with bushings D' as shown in Fig. 9 to receive the ends of the shaft. From this construction it will be seen that the ladder and attendant mechanism move from, or rise and fall from, the shaft M as a center. The cutter may be operated from an engine mounted upon the boat, but I prefer the construction shown.

Having described my invention, what I claim is—

1. In combination with a boat, a derrick provided with the oscillating sockets *e*, a pivoted ladder or suction pipe, provided with similar sockets *g*, and the rods or bars *f* mounted in the sockets.

2. In combination with the boat having the downwardly-curved elbow G H, a pivoted suction tube having a telescopic connection with the latter.

3. In combination with a boat having a downwardly-curved pipe G, a curved pipe H fitting against the end of pipe G and adapted to turn about a vertical axis, and a suction tube adapted to slide into and out of the mouth of the pipe H.

4. In combination with a boat having a downwardly-curved fixed pipe G, a curved pipe H fitted to pipe G and provided with a step or bearing *r*, the brackets L L, secured to the boat, and carrying a ring or band K to encircle the upper end of pipe H; and a suction pipe having a sliding connection with the pipe H.

5. In combination with a boat and the downwardly and outwardly curved pipe section H, a suction pipe having a curved end Q to slide within the pipe H, a shaft M journaled in a bracket on the pipe H, and arms O extending from said shaft to the suction pipe.

6. In combination with a boat, the double curved pipe sections G H; a ladder provided with a suction pipe; and a pivot,—concentric with the curvature of the pipe section that receives the suction pipe,—upon which the ladder is mounted.

7. In combination with a boat having the curved pipe section H; a suction pipe having its end fitted to slide therein; a ladder upon which the suction pipe is carried; and a pivot on the pipe-section H upon which the ladder and suction pipe swing.

8. In combination with the ladder and the oscillating cutter, the rocker arms, the connecting cables, and an engine.



9. In combination with the suction pipe having the mouth piece or casting R, the sleeve S in the latter, the cutter shaft T carried by the sleeve, the cutter mounted upon the shaft,  
5 and means for actuating the cutter.

10. In combination with the suction pipe, the cutter herein described comprising the following elements,—a shaft; a hub *t*, having the lateral arms *y*; a disk *u*; cutting blades

*v*; angle irons *w* uniting the blades to the disk and hub, and means connected with the arms *y* for oscillating the cutter.

In witness whereof I hereunto set my hand in the presence of two witnesses.

LINDON W. BATES.

Witnesses:

GEORGE GRAF,  
J. GUTHRIDGE.