(No Model.)

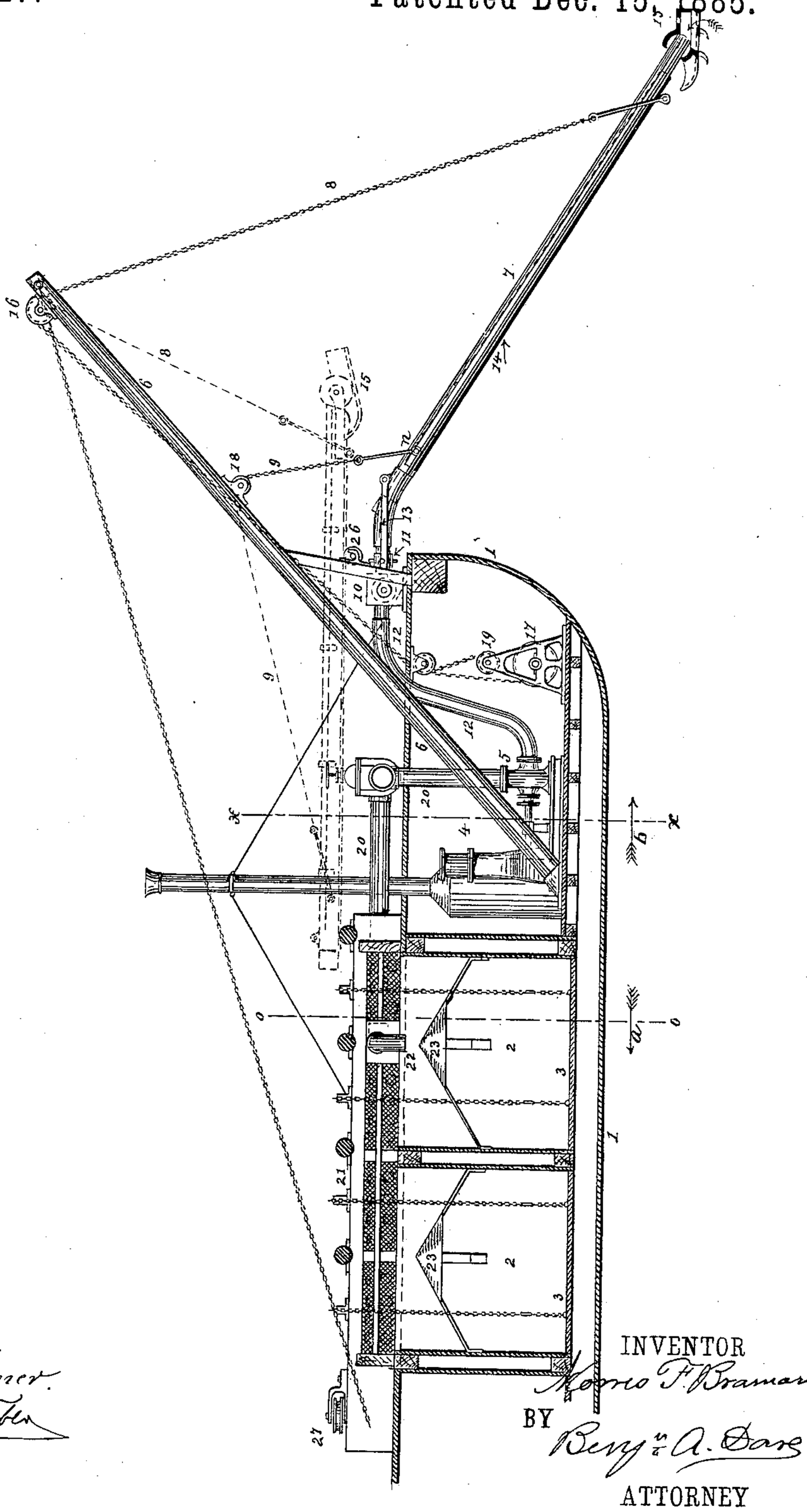
3 Sheets—Sheet 1.

M. F. BRAINARD.

EXCAVATOR.

No. 332,227. Patented Dec. 15, 1885.

Fig. 1.



WITNESSES:

C. Th. Wagner.

Christian Weber

INVENTOR

Morris F. Brainard

BY

Berry & A. Dare

ATTORNEY

(No Model.)

3 Sheets—Sheet 2.

M. F. BRAINARD.

EXCAVATOR.

No. 332,227. Patented Dec. 15, 1885.

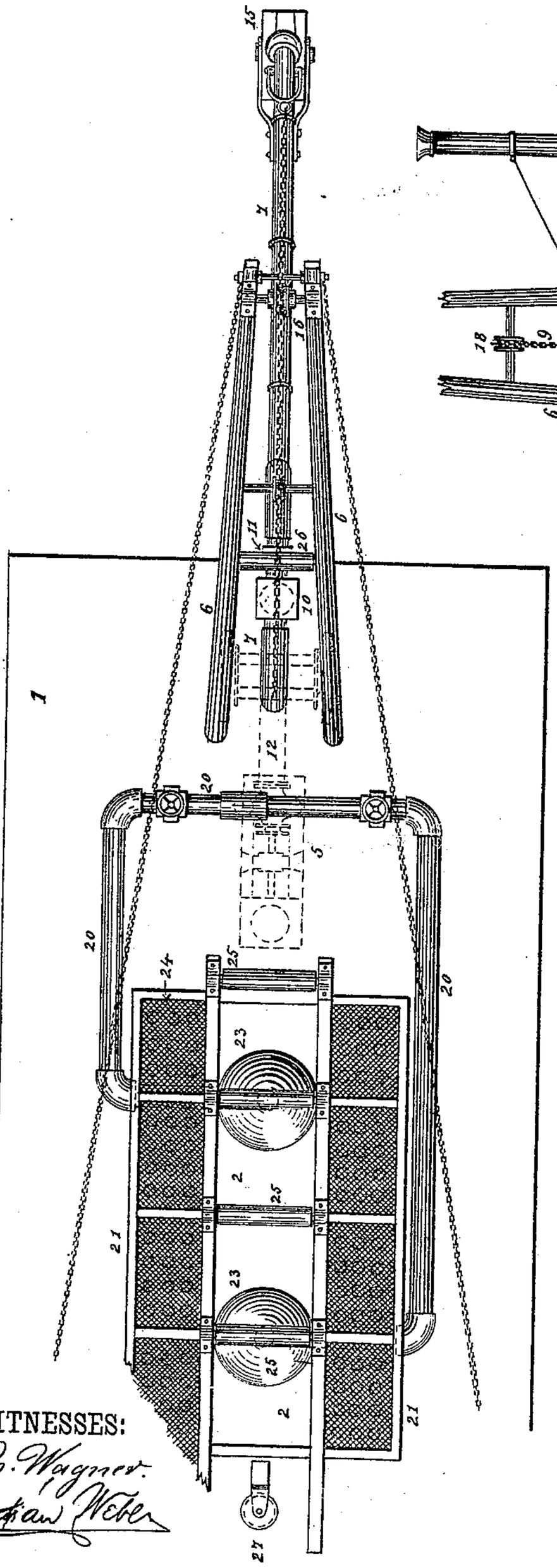


Fig. 2.

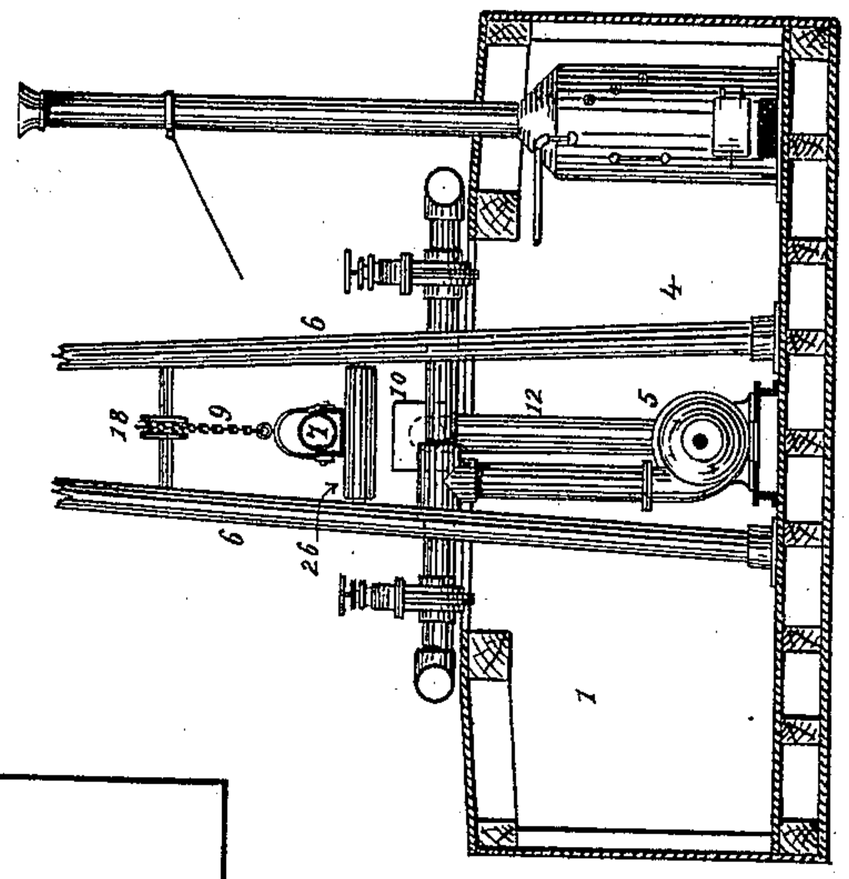


Fig. 4.

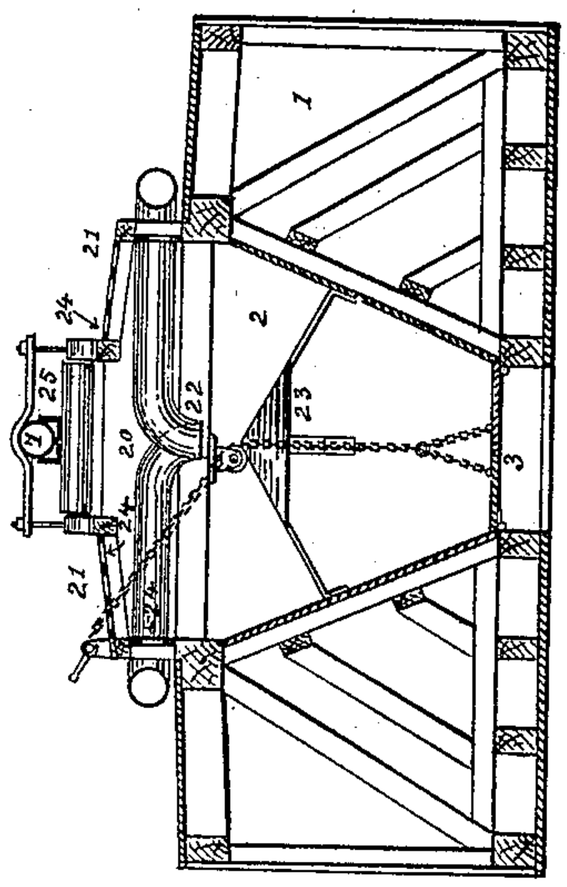


Fig. 3.

WITNESSES:

C. Ph. Wagner.

Christian Weber

INVENTOR

Morris F. Brainard

BY

Berry & A. Dare

ATTORNEY

(No Model.)

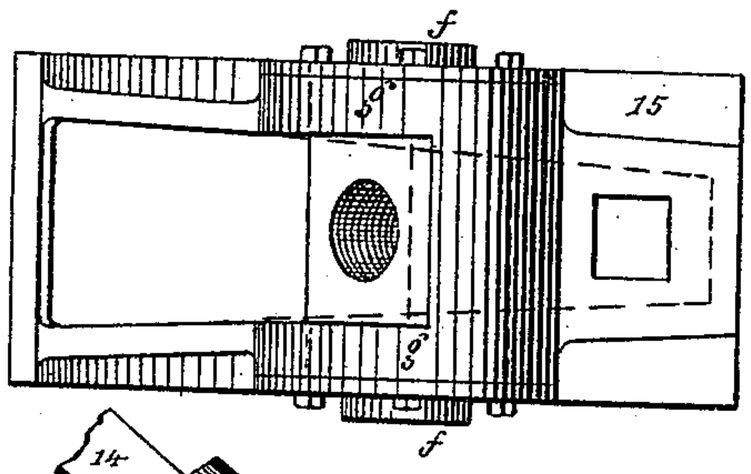
3 Sheets—Sheet 3.

M. F. BRAINARD.

EXCAVATOR.

No. 332,227. Patented Dec. 15, 1885.

Fig. 5.



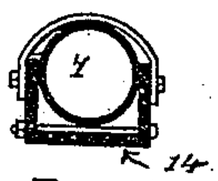


Fig. 11.

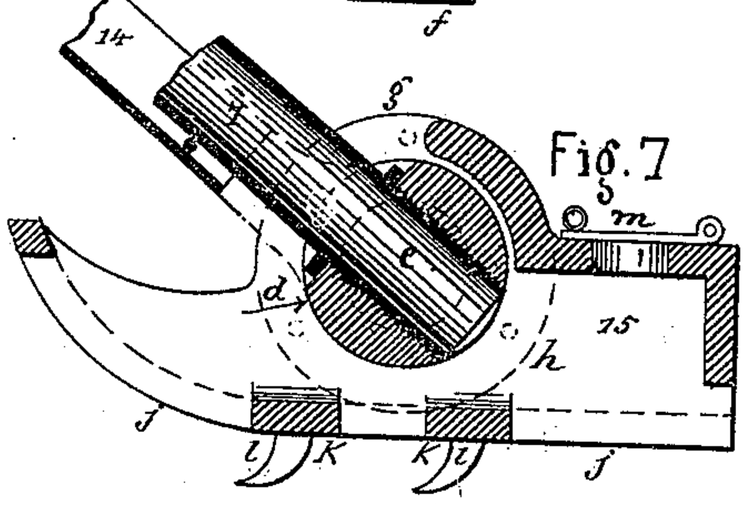


Fig. 7.

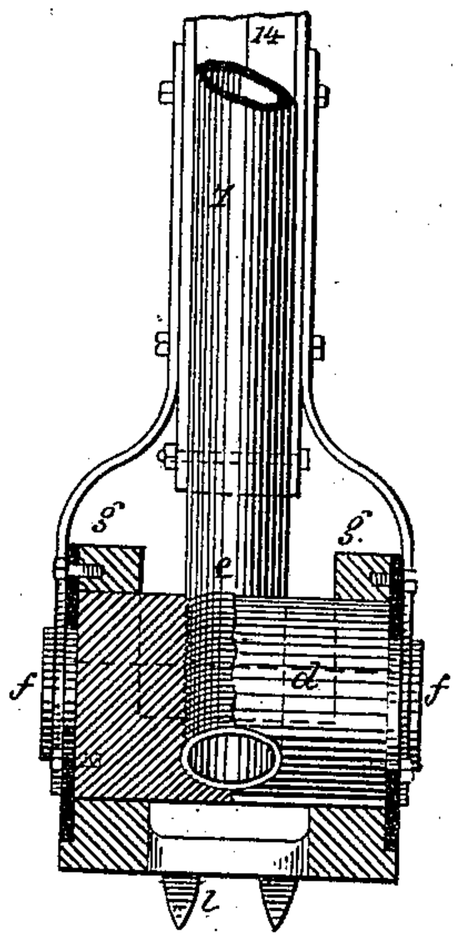


Fig. 6.

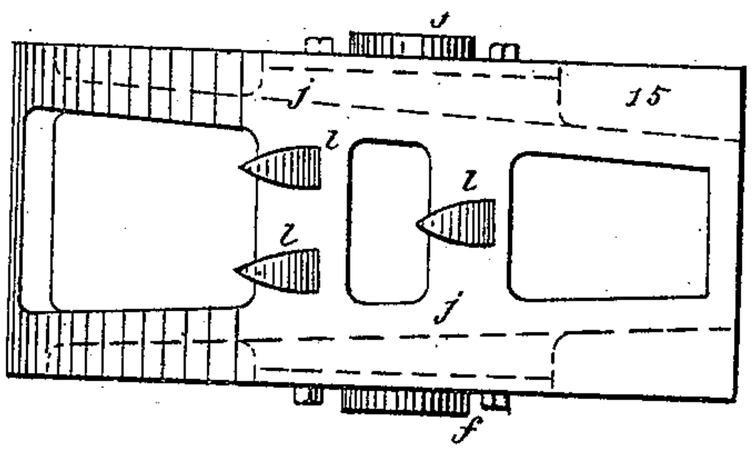
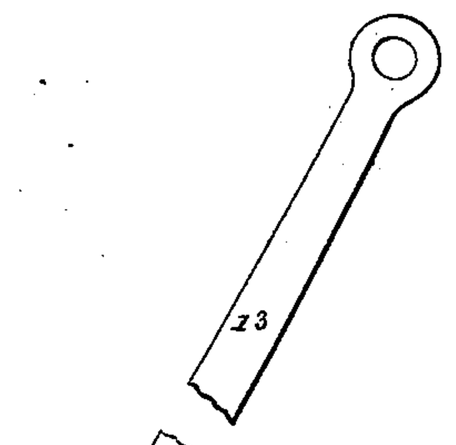


Fig. 8.



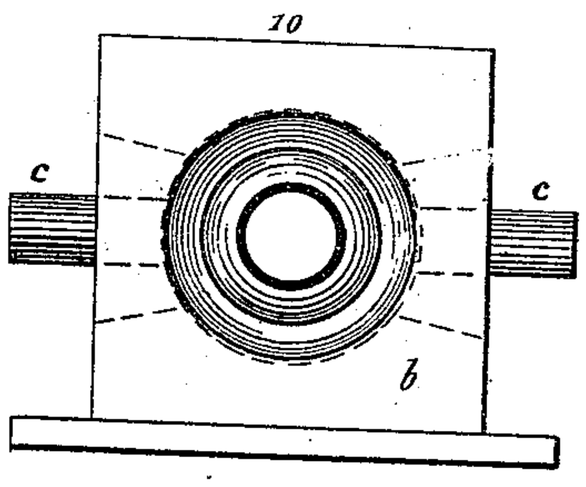


Fig. 9.

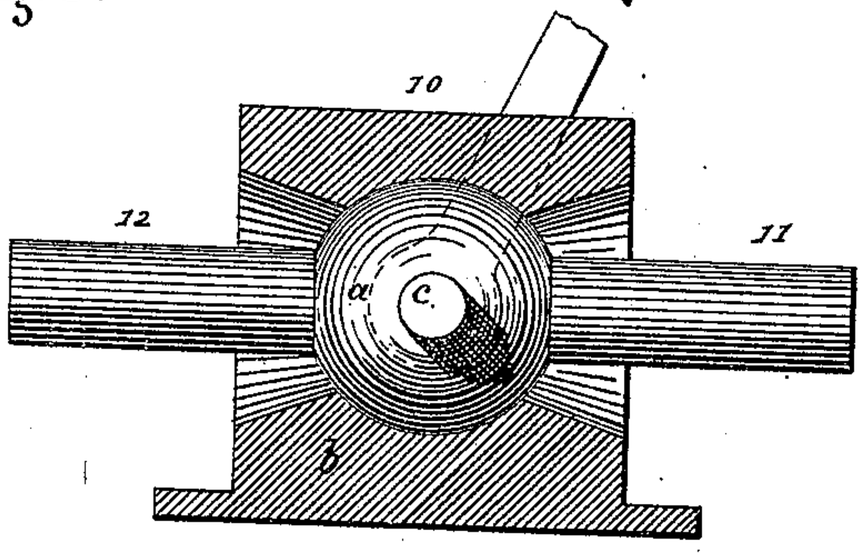


Fig. 10.

WITNESSES:

C. Th. Wagner.

Christian Weber

INVENTOR

Morris F. Brainard

BY

Benj. A. Dare

ATTORNEY

UNITED STATES PATENT OFFICE.

MORRIS F. BRAINARD, OF BROOKLYN, NEW YORK.

EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 332,227, dated December 15, 1885.

Application filed January 23, 1885. Serial No. 153,812. (No model.)

To all whom it may concern:

Be it known that I, MORRIS F. BRAINARD, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvement in Excavators, of which the following is a specification.

My invention relates to the class of excavators for removing sand and gravel by pumping.

The object of my invention is to produce an excavator which may work in a rough sea at any depth, and where it is impossible to operate any of the present excavating appliances. I attain this by constructing the scow and excavating machinery on the same float.

My further object is to devise means for preventing the excavating-pipe from clogging, and to properly perform its work without regard to position of the float in rough seas, which will be hereinafter more fully described in the accompanying drawings.

Figure 1 represents a longitudinal section of excavator; Fig. 2, a plan of same; Fig. 3, a cross-section, *o o*, Fig. 1, in direction of arrow *a;* Fig. 4, a cross-section, *x x*, Fig. 1, in direction of arrow *b;* Figs. 5, 6, 7, and 8, a detail of oscillating shoe, enlarged; Figs. 9 and 10, a swivel-joint for connecting suction-pipe, enlarged; Fig. 11, a cross-section of suction-pipe and frame.

1 represents scow or float, provided with bins 2, for the reception of excavated material, having discharge-doors 3 at the bottom. In the after part of the float a compartment, 4, is constructed, in which the centrifugal pump 5 is placed, also the motive power. Above the deck and aft of the compartment 4 the boom or shear poles 6 extend, to which the suction-pipe 7 is attached by adjusting-chains 8 9. Upon the deck, under the poles 6, is secured a swivel-joint, 10, to which the pipe 7 is connected on one side at 11, and the pipe 12 connects the opposite side to the centrifugal pump 5.

The swivel-joint 10 (see Figs. 9 and 10) consists of the ball *a*, moving freely in any direction within the case *b*. The said ball is provided with suitable pipe-connection at 11 and 12 and protruding lugs or trunnions *c*, to which one end of the links 13 is attached. The other end of said link 13 is attached to the frame 14, supporting the pipe 7, the links 13 keeping the frame 14, ball *a*, and pipe 7 in the same relative position and at any angle, and thereby relieving the strain off the pipe-connecting joint 11. The pipe 7 is supported its entire length by frame 14, to which it is secured, and at the lower end of pipe 7 and frame 14 is secured the oscillating shoe 15, which consists of the cylinder *d*, (see Figs. 5, 6, 7, 8,) attached to the pipe 7 at *e* and the frame 14 at *f*, and journaled in frame or case *g*, which forms a suction-chamber, *h*. The case *g* is provided with broad runners *j*, to prevent same from burying in the sand, and to the cross-cars *k* are secured plows or drags *l*, for agitating or loosening the material. In the top of the case *g* a valve, *m*, is placed, which regulates the supply of water admitted to the chamber *h*. The said valve *m* is operated from the deck of float 1. The shoe 15 oscillates on the cylinder *d*, thereby adjusting itself to any angle required. If desired, a swivel or ball joint may be inserted in the frame or case *g*, (instead of the cylinder *d*,) which will allow the said shoe 15 to move freely in any direction whatsoever in a similar manner as the swivel-joint 10.

To the outer end of the frame 14 the chain 8 is secured and passes through suitable sheaves, 16, in the end of boom 6; thence to the drum 17 in engine-room 4. The chain 9, which is attached to the frame 14 at *n*, also passes over sheaves 18 on boom 6; thence to drum 19, the pipe 7 being raised or lowered by this means as desired. The material is discharged from the pump 5 through the pipe 20, which passed along the deck on either side of the coping 21, and through the nozzles 22 into the bins 2. The material discharged through the nozzles 22 strikes upon a cone-shaped disk, 23, secured in said bins 2, which breaks the force of the fall and distributes the material so that it will settle more readily. The coping and false deck are provided with overflow holes 24, to allow the water to escape from the bins 2, said holes 24 being covered with fine wire screens to prevent the material from escaping. Upon the false deck the guide-rollers 25 are erected, on which the pipe 7 and frame 14 are secured when transporting from place to place. When the said pipe 7 is to be thus secured, the pins connecting frames 14 and link 13 are removed, and the pipe 7 disconnected at

11. The end of the pipe and frame is raised by chain 9 to rest on the roller 26. The chain 8 then raises the outer end of the pipe and frame until it is in the position shown by dotted lines, Fig. 1. It is then drawn forward, as desired, by chain 9 being placed over sheave 27. The chains 8 and 9 are never disconnected from the frame, and all the shipping and unshipping of same is performed by the said chains.

What I claim is—

1. In an excavator scow, the bins or pockets covered with wire screen or netting, and provided with a solid cone-disk, 23, upon which the material is discharged, substantially as and for the purpose specified.

2. In an excavating-scow, the guide-rolls 25, erected upon the false deck thereof, and in combination with suction-pipe 7 and frame 14, substantially as and for the purpose specified.

3. In an excavator, the swivel or socket joint 10, consisting of the ball *a*, pipe-connections 11 and 12, protruding lugs *c*, link 13, and case or frame *b*, in combination with the pipe 7 and frame 14, substantially as and for the purpose specified.

4. In an excavator, the pipe 7 and frame 14, in combination with links 13 and swivel-joint 10, substantially as and for the purpose specified.

5. In an excavator, the oscillating shoe 15, consisting of the cylinder *d*, case or frame *g*, suction-chamber *h*, valve *m*, and runners J, in combination with frame 14 and pipe 7, substantially as and for the purpose described.

6. In an excavator, the scow 1, bins 2, compartment 4, pump 5, swivel-joint 10, suction-pipe 7, frame 14, oscillating-shoe 15, adjusting-chains 8 9, booms 6, guide-rolls 25, cone-disk 23, and overflow-holes 24, covered with wire screen, all constructed substantially as described.

Signed at New York, in the county of New York and State of New York, this 21st day of January, A. D. 1885.

MORRIS F. BRAINARD.

Witnesses:

C. TH. WAGNER,

CHRISTIAN WEBER.