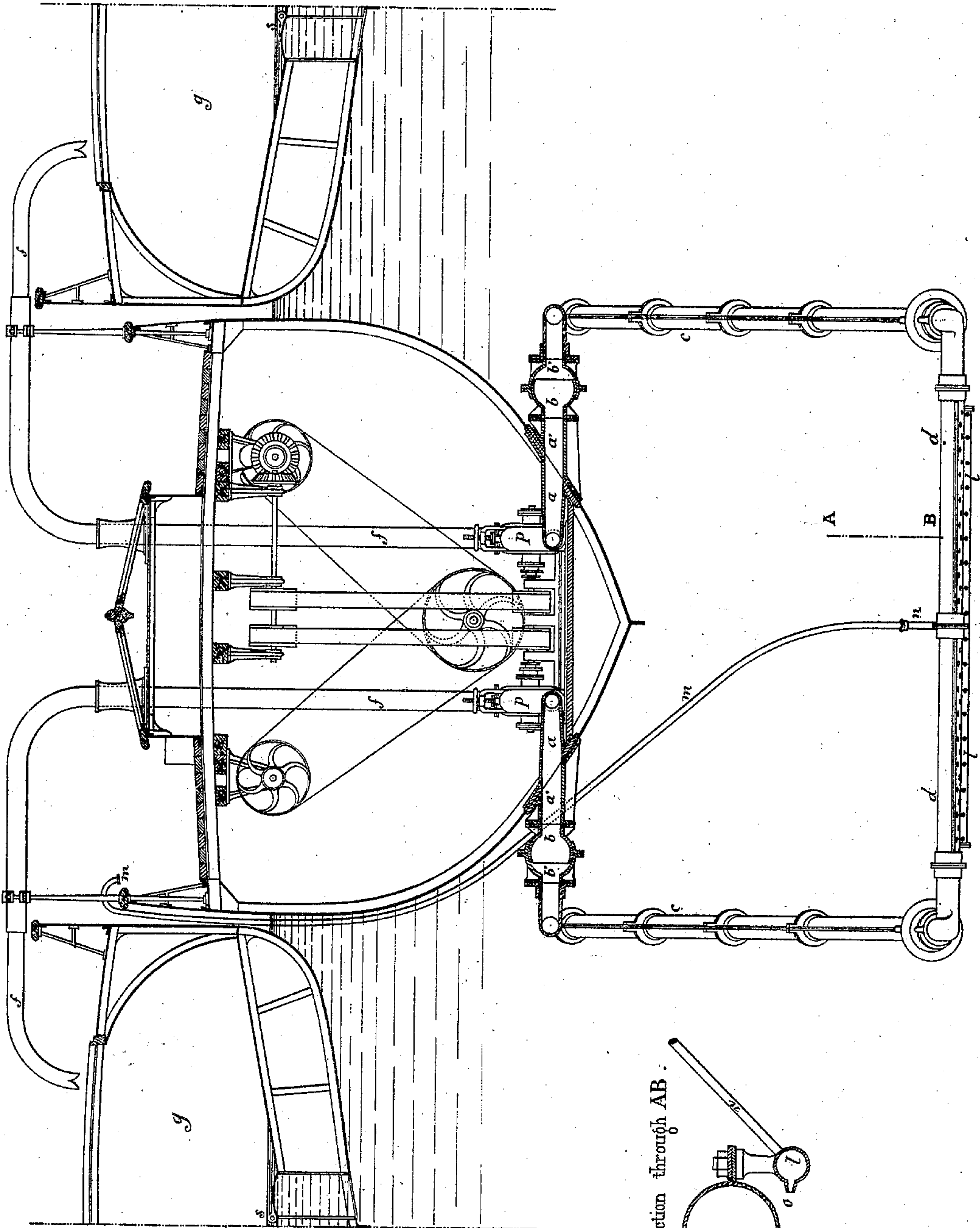


3 Sheets--Sheet 1.

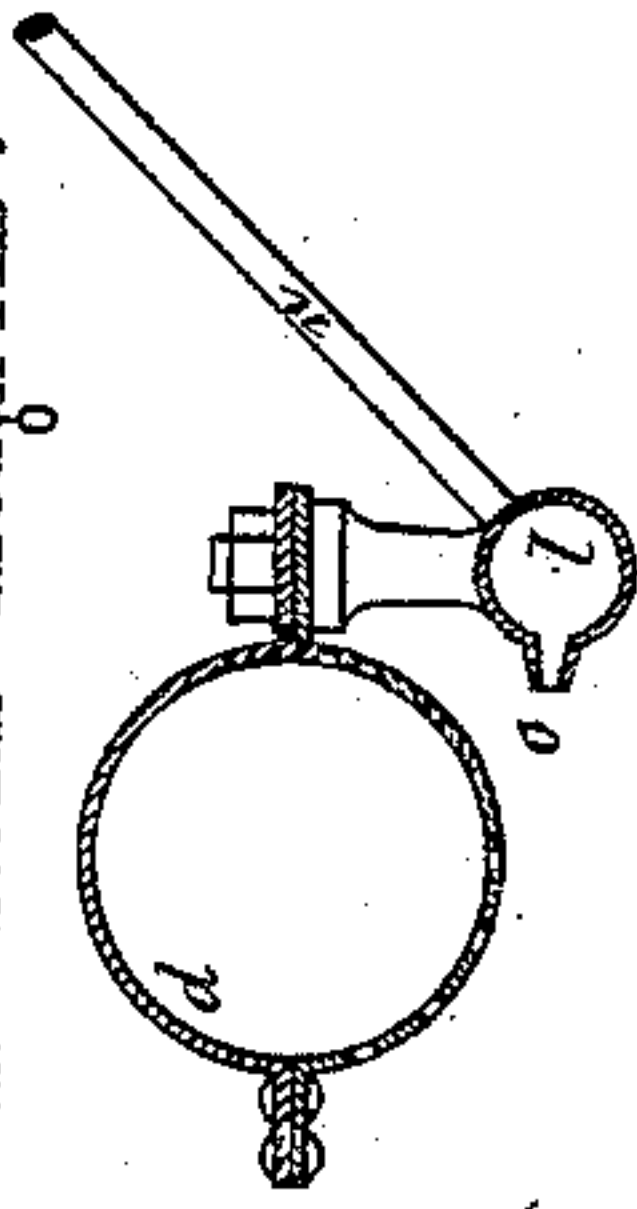
**E. BAZIN.**  
**Dredging Apparatus.**

No. 143,269.

Patented September 30, 1873.



Cross Section through AB.



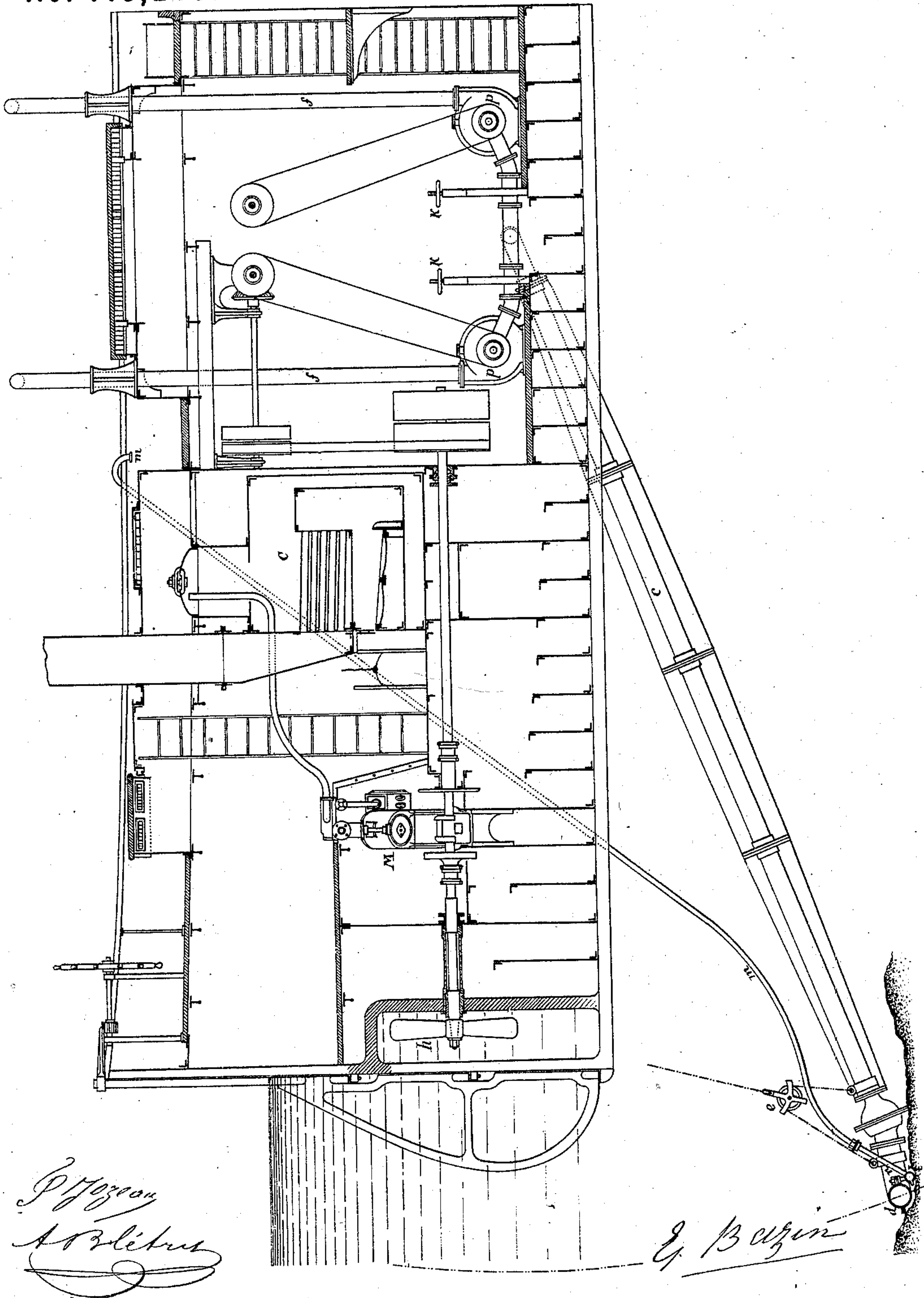
*E. Bazin*  
*A. O. H. H. H.*

*E. Bazin.*

**E. BAZIN.**  
**Dredging Apparatus.**

No. 143,269.

Patented September 30, 1873.

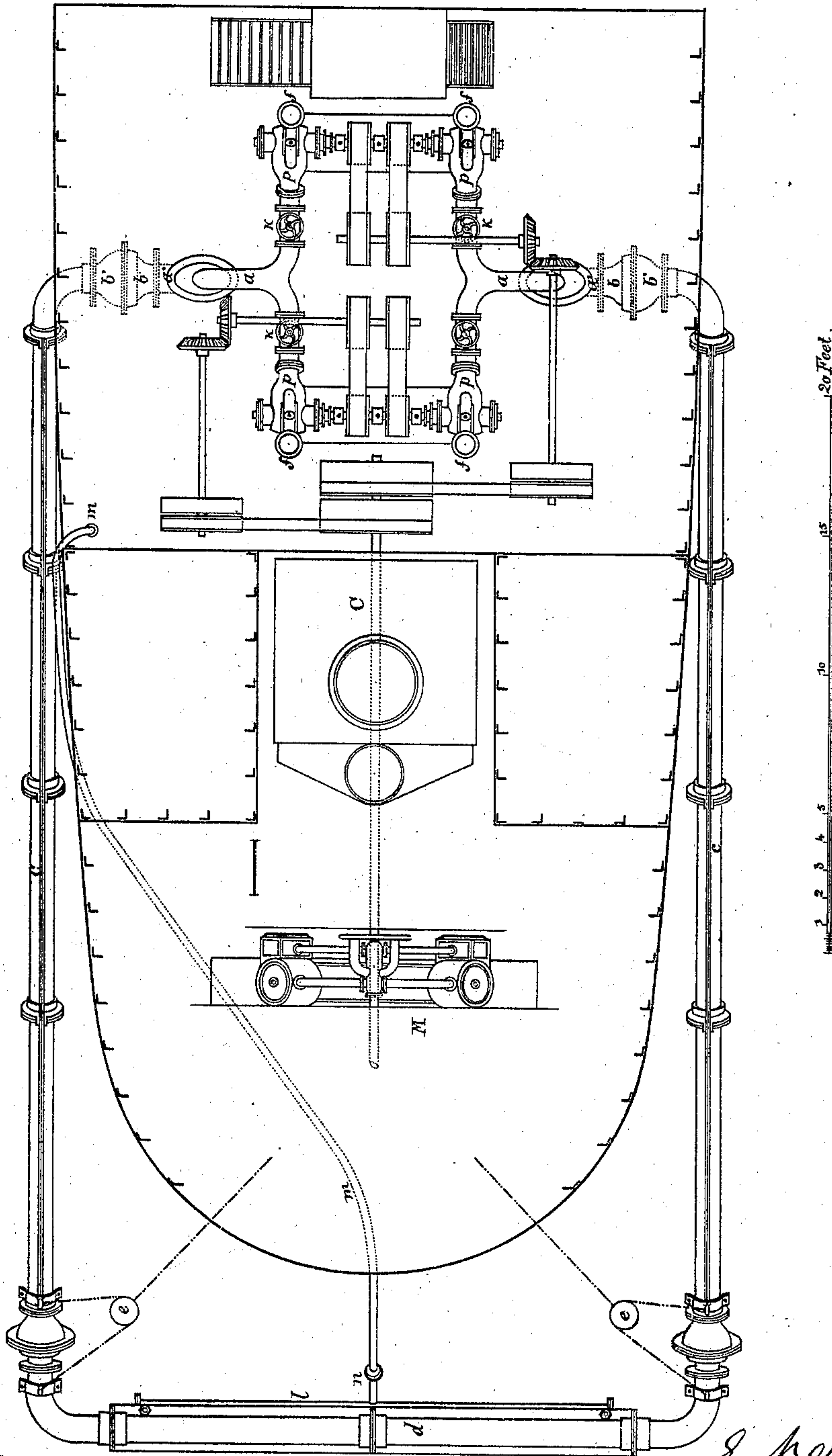


3 Sheets--Sheet 3.

**E. BAZIN.**  
**Dredging Apparatus.**

No. 143,269.

Patented September 30, 1873.





# UNITED STATES PATENT OFFICE.

ERNEST BAZIN, OF PARIS, FRANCE.

## IMPROVEMENT IN DREDGING APPARATUS.

Specification forming part of Letters Patent No. 143,269, dated September 30, 1873; application filed March 3, 1873.

*To all whom it may concern:*

Be it known that I, ERNEST BAZIN, of Paris, France, have invented certain Improvements in Dredging Apparatus, of which the following is a specification:

The object of this invention is to rapidly and economically extract mud, ooze, sand, or gravel from large or small rivers of any depth, from canals, harbors, ports, channels, straits, or from foundered vessels, and for cleansing or dredging the same. This is effected by establishing in the hold of a floating vessel or dredging-boat a water draft or lift, thus creating an hydraulic flow, the result of the difference of level between the water-line of the vessel and the point of entry of the draft into its interior—a force admitting of a natural and free dredging and removal of mud and gravel from any depth to the hold of the boat, whence it is discharged in any suitable direction by aid of centrifugal pumps or other appropriate apparatus. If the dredgings are to be conveyed any considerable distance they are deposited in lighters or barges furnished with valves easily maneuvered, so that they are quickly emptied.

The novelty and economy of this system of dredging will be readily understood on reference to the accompanying drawings.

Sheet 1 is a transverse section of the dredging-boat through the axis of the extractors. Sheet 2 is a longitudinal section, not showing the head of the vessel, which does not embrace any particular of the invention. Sheet 3 is a plan of the part shown in Fig. 2, supposing the deck removed.

At the bottom of the hold the hull is pierced with two apertures, constituting the water-drafts. The tubes *a a'* unite with the sides of the vessel and form perfectly-tight joints. The tubes *a'* are bolted to the tubes *b*, the ends of which are hollow spheres, sectioned and perfectly turned. To these spheres are adjusted the spherical ends of the pipes *b'*, thus forming together a socket-joint to allow the tubes *b'* to turn all ways, while those *b* and *a'* are fixed. The tubes *b'* unite at their bent ends with long pipes *c c*, the other ends of which terminate in spherical joints the same as *b'* and *b'*, and are connected to the bent ends of the perforated pipe *d*. The result of

this arrangement, as shown in the drawings, is a metal frame of a mobility and flexibility equal to the requirements of dredging. This frame, the side of which, *d*, rests on the mud or otherwise, is raised and supported by means of a lifting apparatus, the chain of which is attached to the pulleys *e e*. The pipe *d* is perforated with holes of dimensions varying in accordance with the nature of the matter to be extracted. Supposing then, for instance, that the pipes *a a* debouch freely into the vessel, the result is that, by virtue of the difference of level existing between the water-line and that of the water-drafts, the hydrostatic head produced establishes a current of ascending liquid from the pipe *d* to the pipes *c c*, the rapidity of which is increased as the difference of level is augmented, and is always sufficient to draw along with the water a greater or less amount of mud or sand. This current liquid and this drawing along of denser matter would diminish according as the vessel filled, and would completely cease when the level in the vessel approached or attained the water-line. The extraction of mud and sand would terminate long before this limit, for the velocity of ascension of the liquid decreases, so that it is no longer strong enough to draw them along.

It may be conceived that for a regular working, and to keep an invariable water-line in relation to the water-drafts, it is of the greatest importance to take the mixed liquids on their arrival in the tubes *a a* and to conduct them to any suitable destination or to collect them in boats. For this purpose each of the water-drafts is put in communication with two centrifugal pumps, *p p*, placed on a beam at the bottom of the vessel. These pumps deliver the liquids to the conduits *f f*, whence they are transferred to the lighters or barges *g g*, or conveyed a short distance. The pumps *p* are worked by a machine, *M*, with two inclined cylinders, actuating alternately the propeller *h* and the machinery for extracting the mud and sand.

The drawings sufficiently show the transmission of motion without further explanation.

*C* is the boiler. Between the pumps *p p* and the water-drafts *a a* valves and fly-wheels



K K are arranged to allow of working the pumps in the most suitable manner, singly or in variable number, according to the nature of the labor, and also to facilitate repairs when necessary without interruption to work.

It may sometimes happen that the matters to be extracted are not sufficiently disgregated to yield to the liquid current of the pipe *d*. In this case they are separated by forcing water at high pressure below the pipe *d*, as shown by the cross-section through A B of Fig. 1, into a tube, *l*, furnished with jets *o o*, configured so as to separate the matters, and at the same time facilitate their entry in the openings in the pipe *d*, which, by this means, is kept clean.

A pump established in any suitable position in the dredging-boat energetically forces water into the flexible tube *m*, which joins the tube *n* of the tube *l*.

When the liquid extracts are to be transported they are discharged into the lighters *g g*, furnished with valves *s s*, on opening which the barges are instantly unloaded. Sheet 1 shows these boats commencing to load.

The valves *s s* do not prevent the entry of water as far as the water-line.

I claim—

1. The mode of extracting mud and sand from any depth by means of a dredging-vessel, having two or more apertures in its hull below the water-line, and forming water-drafts by aid of the pipes *a a'*, the ends of which terminate in spherical sockets for the reception of the pipes *b b'*, in connection with pipes *c c*, also terminating spherically, and the perforated pipe *d*, the whole forming a metallic frame capable of being raised and lowered, as desired, by aid of the chain and pulleys *e e*, the sand, gravel, or mud being removed as it arrives, by the pipes *a a*, by means of centrifugal pumps *p p*, and thence conducted to a convenient position or deposited in lighters or barges, thence to be conveyed away as may be desired.

2. The mode of disgregating or separating the solid matter by means of jets of forced water, conducted by the elastic tube *m n* to the pipe *l*, furnished with jets *o o*, which at the same time clean the perforated pipe *d*, and allow the matter to pass, substantially as and for the purposes hereinbefore set forth.

E. BAZIN.

Witnesses:

P. JOZEAU,  
A. BIETUS.