

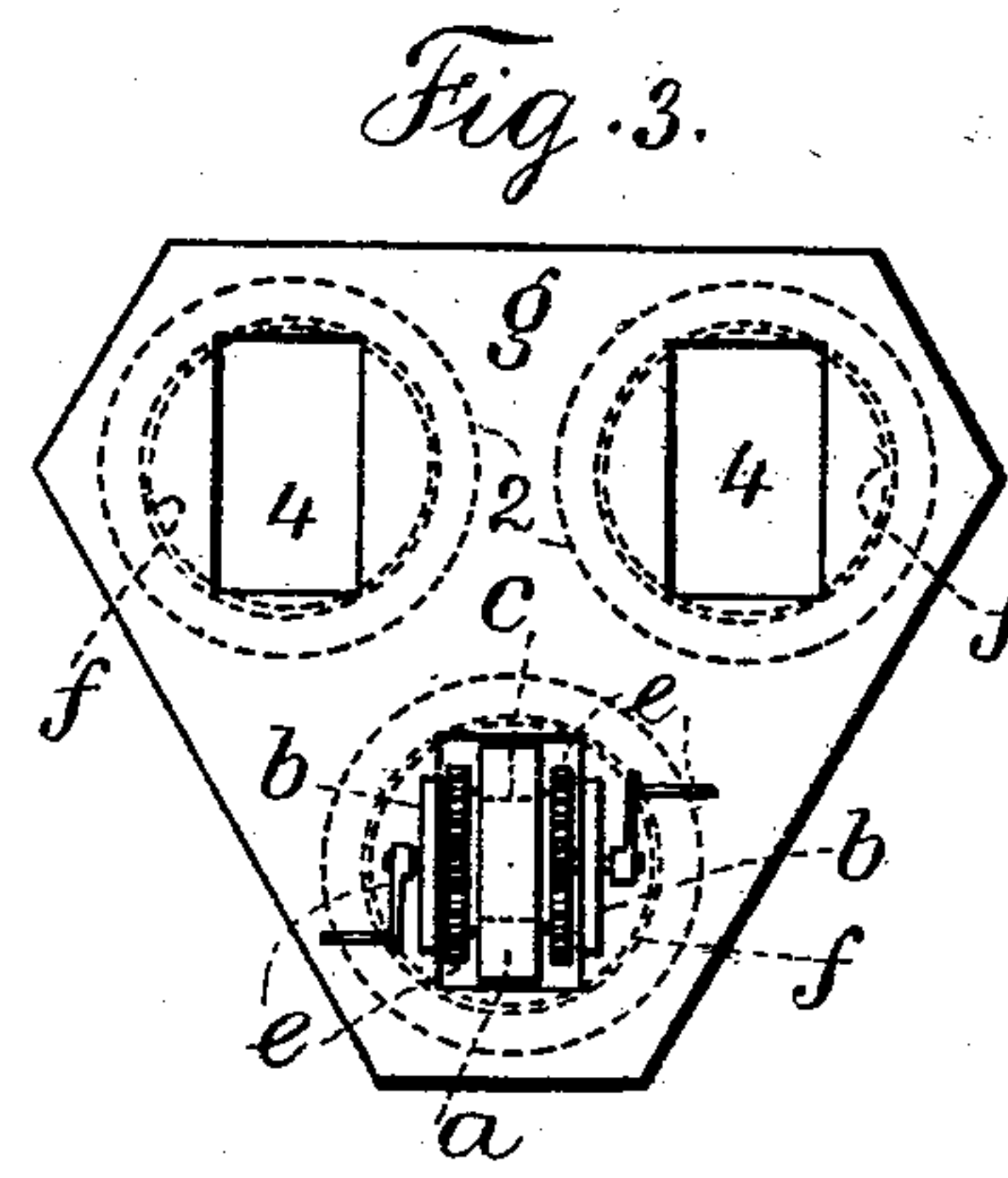
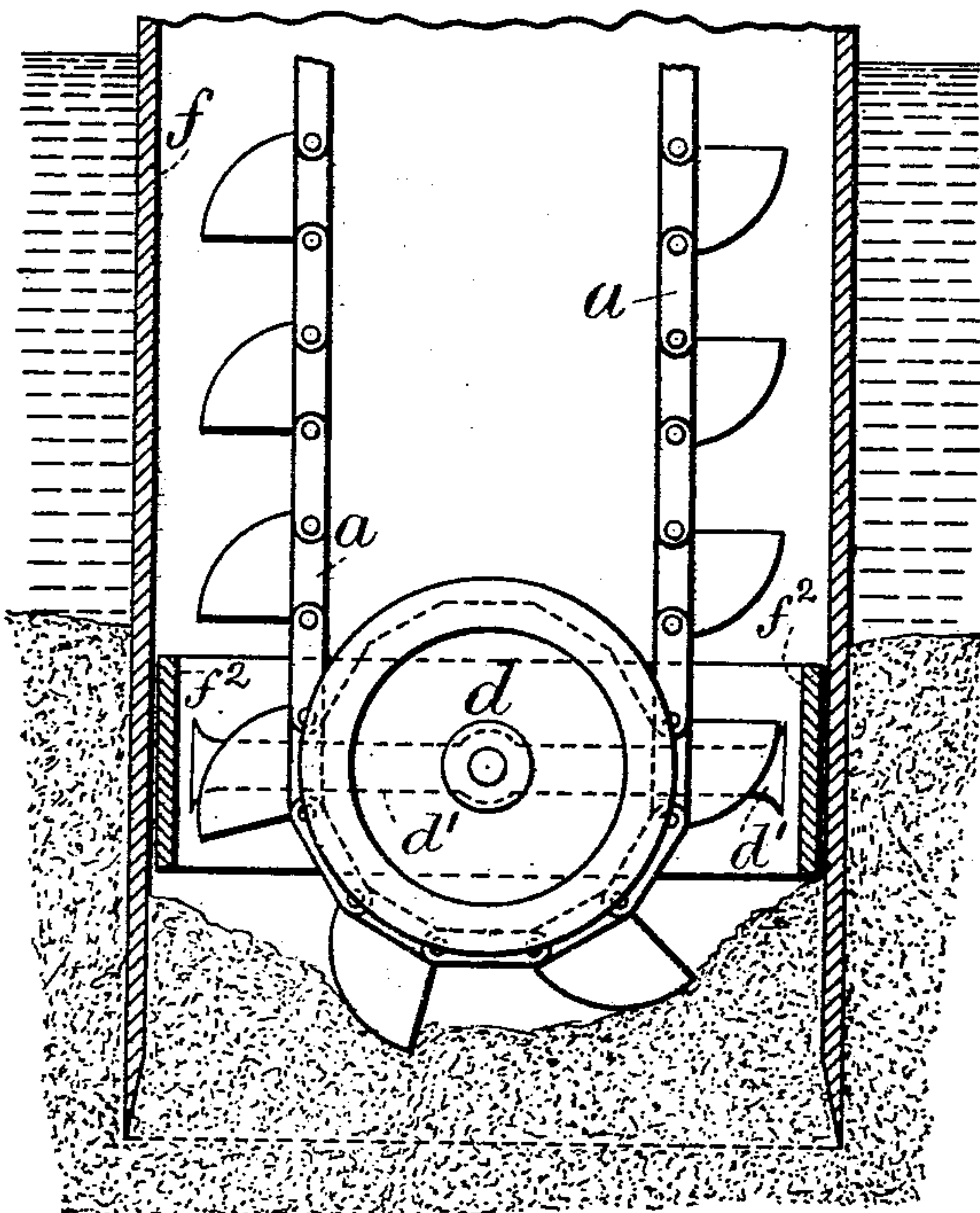
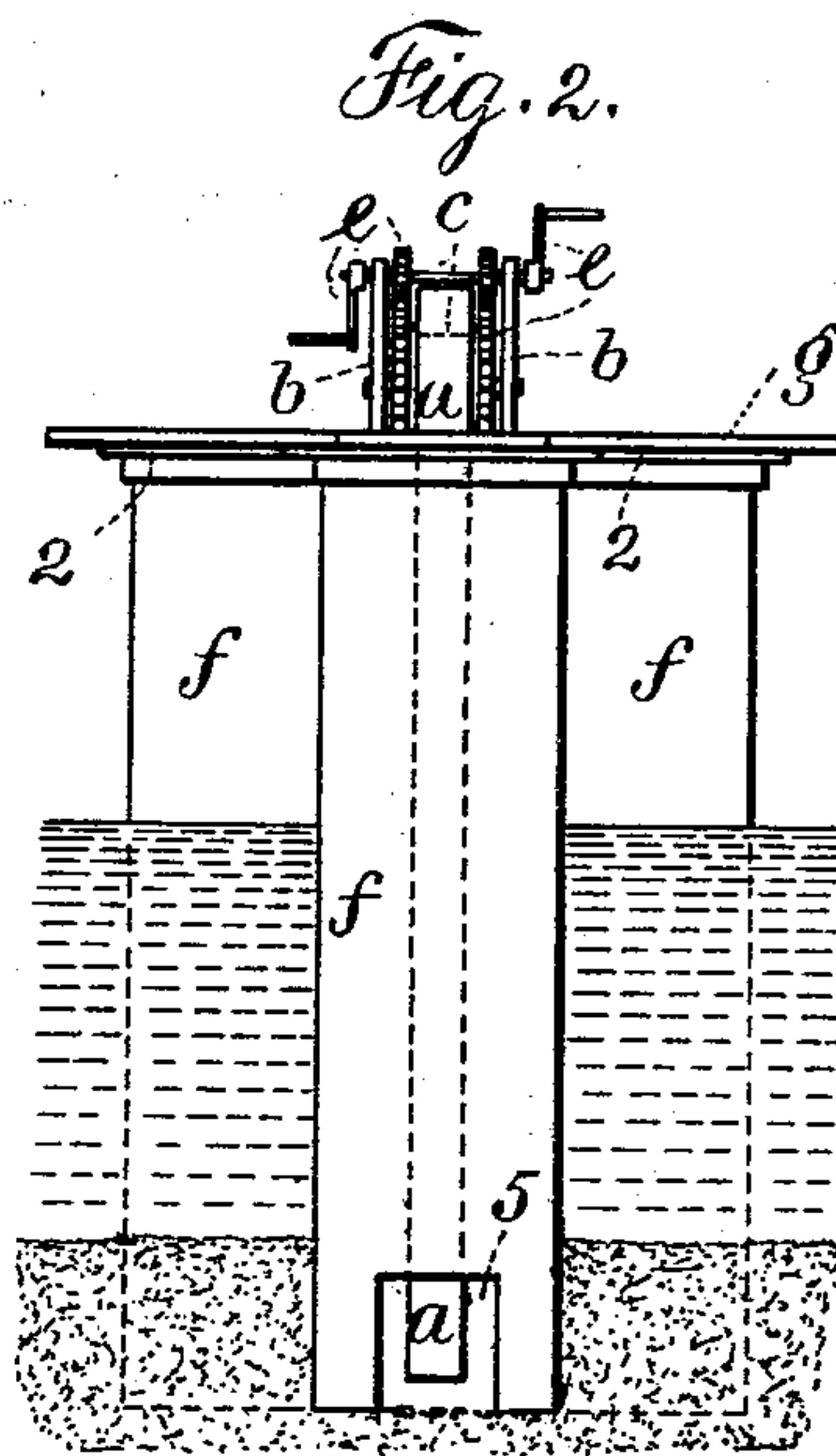
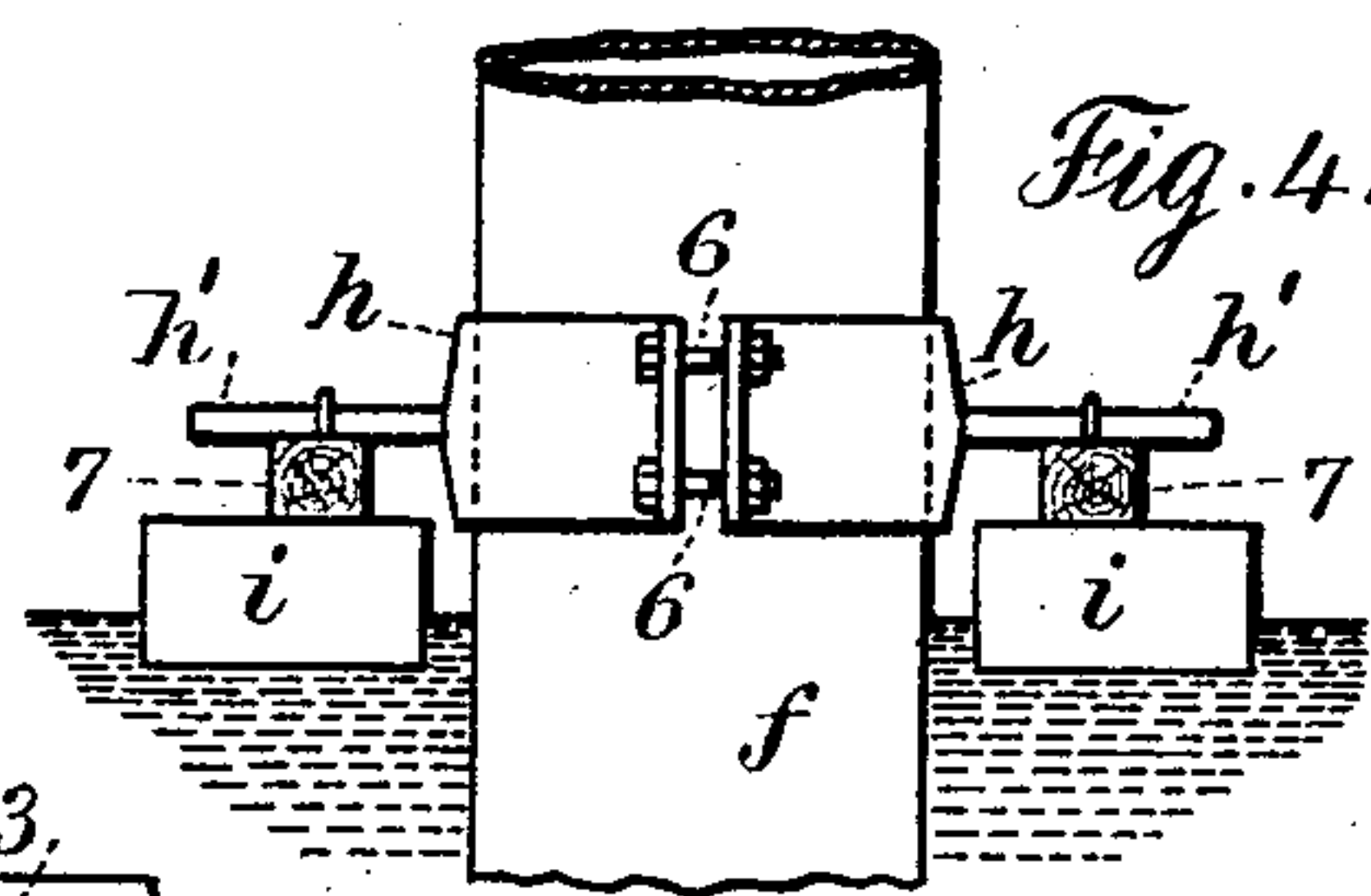
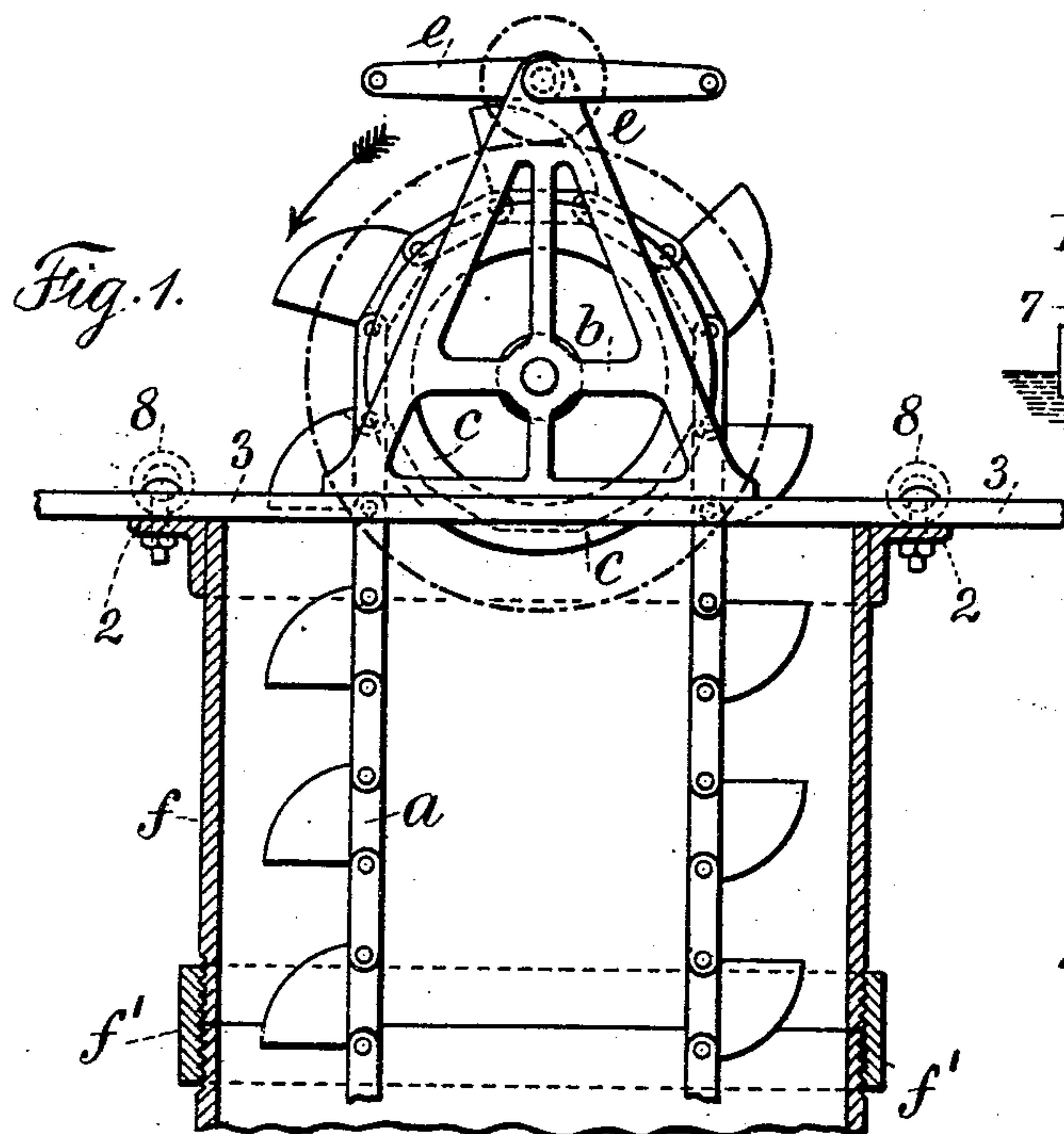
No. 664,628.

Patented Dec. 25, 1900.

F. ECAUBERT.
DREDGING APPARATUS.

(Application filed Mar. 3, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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DREDGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 664,628, dated December 25, 1900.

Application filed March 3, 1900. Serial No. 7,158. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC ECAUBERT, a citizen of the United States, residing at New York, borough of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Dredging Apparatus, of which the following is a specification.

My invention is in the nature of an improvement upon the device shown and described in the patent issued to myself and I. M. Hofstad, No. 650,674, dated May 29, 1900. In said patent a chain-and-bucket conveyer was employed to raise sand or gravel with precious metals from the bottom of a body of water and a weight-wheel at the lower loop of the chain-and-bucket conveyer served to keep the same vertical and taut and the said wheel turned with the movement of the conveyer. The device of the said patent was only adapted for removing materials to a short depth; and the object of my present invention is to be able to remove the materials to a considerable depth, as it has been demonstrated that the layer of sand and gravel becomes richer with the depth down toward a clay stratum.

In carrying out my invention I employ a chain-and-bucket conveyer and a weight-wheel, a support, and a power-wheel for operating the chain-and-bucket conveyer, and I employ a tubular body of metal surrounding the chain-and-bucket conveyer and passing vertically down through the water, with the lower edge resting in and upon the sand or gravel at the bottom of the body of water, the same forming a well-inclosure. The conveyer-buckets raise the materials from within the tubular body and the same sinks as the materials are raised, and greater depths can thus be reached than are possible by the device of the aforesaid patent. I may employ several of these tubular bodies and connect the same together adjacent to their upper ends by a platform, which platform may serve to support the operators or the machinery for operating the chain-and-bucket conveyer. This platform may be removable, so that the tubular bodies may be raised and the apparatus put together for operation in a new place. I may provide openings in similar sides of the tubular bodies, so as to let in a small quantity of gravel and sand from out-

side of the same. This will reduce the resistance on one side and as the tubular bodies descend will cause them to advance and automatically shift their position. The said tubular bodies may be in sections, with threaded couplings so constructed as to be separable, similar to lengths of pipe, in order to facilitate transportation and handling of the parts.

I provide devices by which the tubular bodies can be drawn upward out of the sand. Among these devices I prefer a divisible collar surrounding the tubular body and which is securely bolted thereto, the said collar being provided with arms against which pontoon-floats or air-filled devices forming floats are adapted to be placed at low tide, so that with the rise of the tide the tubular body will be automatically lifted.

In the drawings, Figure 1 is an elevation and partial section representing my improvement. Fig. 2 is an elevation, and Fig. 3 a plan view, showing three connected tubular bodies and their platform and one chain-and-bucket conveyer. Fig. 4 is an elevation showing the floating device for removing the tubular body from the sand.

The chain-and-bucket conveyer *a* may be of any desired construction, and I provide a support *b* and power-wheel *c* for the upper loop of the chain-and-bucket conveyer *a*, and in the lower loop of the said chain-and-bucket conveyer I prefer to place a weight-wheel *d*. The said power-wheel *c* and the chain-and-bucket conveyer may be operated in any desired manner. I have, however, shown a winch device *e*.

The tubular body *f* is preferably open-ended and of heavy sheet-iron, like boiler-iron, and is of such size as to readily receive the chain-and-bucket conveyer passed vertically through the same. The lower edge of the tubular body is preferably sharpened, and the tubular body may be in sections, as shown in Fig. 1, where a sleeve *f'* surrounds one part of the tubular body and is interiorly threaded, so that the other part of the tubular body is adapted to be screwed into the same in joining up the sections. This construction is for convenience of handling and transportation.

I prefer at the upper end of the tubular body *f* to place brackets 2 and a platform 3,

crossing the same and carrying the support *b* for the chain-and-bucket conveyer, there being an opening through the platform 3 to receive the conveyer and through which the same is operated. The tubular body *f* is first placed upright on the bottom of the body of water, and the chain-and-bucket conveyer, the platform-support, and means for operating the same are supported by the tubular body, and as the sand and gravel are raised from within the tubular body the same descends by gravity. Consequently a considerable depth can be reached which would otherwise be unattainable through the devices of the aforesaid patent, or ordinary dredging mechanism.

The material elevated by the chain-and-bucket conveyer may be delivered into any suitable receptacle for after treatment and the separation therefrom of precious metals; but the same forms no part of my present invention.

I prefer to connect several tubular bodies *f*, and have illustrated such connection in Figs. 2 and 3, in which a platform *g* is built upon and supported by three tubular bodies. The platform may be put together in any well-known manner or knockdown condition and supported in any way upon the top of the several tubular bodies. In this platform there are openings 4, through which pass the chain-and-bucket conveyers down within the several tubular bodies. It is of course apparent that the three tubular bodies will be much more stable than it would be possible for one to be alone, the three chain-and-bucket conveyers being operated either simultaneously or with regularity, so that about the same amount of material is removed from within each tubular body to insure the parts maintaining their proper level. As the sand and gravel are removed the several tubular bodies, with their platforms, descend to greater depths, and when all the material available—down, for instance, to a clay bed—has been removed the bucket conveyers and the supports therefor are removed to a vessel or float, the platform is taken apart and stored, and the various tubular bodies are elevated and conveyed to a new position and the parts re-assembled for further work.

I may cut away the lower edge or adjacent portion of one or more of the tubular bodies or of those connected in a group, as at 5, Fig. 2. These openings are preferably, and as shown, of a length about equal to the depth the tubular body is in the sand, and it is obvious that the same object will be accomplished by several adjacent openings, one above another. Where this is done the tubular bodies will be so set that the openings will all correspond in like sides of the cylinders or, in other words, will be all in one direction. The effect of this opening is to allow sand and gravel from outside the tubular body to run into the same to be removed by the chain-and-bucket conveyers with that dug up from with-

in. This action permits a greater pressure to exist on one side of the tubular body than on the other. Consequently as the tubular body descends it advances in a direction toward the opening and much more material is removed than would be the case where it is taken up from within the tubular body alone.

I employ a guide of convenient form within the tubular body, connected to and supported from the axis of the weight-wheel to prevent the chain-and-bucket conveyer swinging and scraping against the inner surfaces of the tubular body. For this purpose I have shown a tube-section *f*² and arms *d'* therefrom to the axis of the weight-wheel *d*. When it is necessary to remove these tubular bodies from one place to another to new fields, it is necessary to raise the same or pull them out of the sand and gravel bottom. As a means for accomplishing this I prefer to employ a collar *h* in two halves, (see Fig. 4,) the halves surrounding the tubular body and being provided with lugs and bolts at 6, by which they are securely connected and clamped firmly around the same. This collar is provided with arms *h'*, standing out horizontally, and these arms are adapted to rest upon pontoon-floats or upon air-inflated floats *i*. Where the air-inflated floats are employed, it is preferable to place beams 7 along their upper surface, coming beneath the arms *h'*, and where several of these tubular bodies are connected it is possible without disconnecting the platform and the chain-and-bucket conveyers to pass beams beneath the said arms around the group of tubular bodies and put air-inflated floats beneath the beams at low tide, so that with the rise of the tide the group of tubular bodies will be elevated and may be floated away to a new place. I have also shown in Fig. 1 by dotted lines rings 8, connected to the brackets 2 at the upper end of the tubular body *f*. A suitable tackle and power-raising device may be connected to these rings from a vessel by which the tubular body may be raised from the bed of sand and gravel and removed to another locality.

I am aware that an apparatus has been employed for collecting and delivering samples of earthy materials from wells and the bottoms of bodies of water in which a tube contained a bucket conveyer actuated by an elevating device to operate the conveyer against its weight and that of the tube, the entire device, with the material collected, being brought to the surface to discharge the material, and I distinctly disclaim such devices. In my improvement the tubular body is independent of the devices for removing the materials, and it may be left in position to form a permanent well-inclosure.

I claim as my invention—

1. The combination in a dredging apparatus with a tubular inclosing body, of a chain-and-bucket conveyer, a supporting-platform upon the upper end of the tubular body, rotating mechanism carried upon said platform

and supporting the chain-and-bucket conveyer and by which the same is operated, whereby with the operation of the conveyer and the removal of the material within and
5 at the bottom of the tubular body, the same sinks by gravity, substantially as specified.

2. The combination in a dredging apparatus, with a tubular inclosing body, of a chain-and-bucket conveyer, a supporting-platform
10 upon the upper end of the tubular body, rotating mechanism carried upon said platform and supporting the chain-and-bucket conveyer, and by which the same is operated, whereby with the operation of the conveyer
15 and the removal of the material within and at the bottom of the tubular body, the same sinks by gravity, and a guide and support at the lower loop of the bucket conveyer, substantially as specified.

3. In a dredging apparatus, the combination with a chain-and-bucket conveyer, a support therefor and means for operating the same, of a weight-wheel in the lower loop of the chain-and-bucket conveyer and around
25 which the lower portion of the same turns, a tubular body surrounding and inclosing the chain-and-bucket conveyer and the weight-wheel and extending down through a body of water and resting in and upon the sand or
30 gravel bottom of the same, substantially as set forth.

4. In a dredging apparatus, the combination with a chain-and-bucket conveyer, a support therefor and means for operating the same, of a weight-wheel in the lower loop of the chain-and-bucket conveyer and around
35 which the lower portion of the same turns, a tubular body surrounding and inclosing the chain-and-bucket conveyer and passing down through a body of water and resting in and upon the sand or gravel bottom of the same, and a guide connected to the axis of the weight-wheel and adapted to come adjacent
40 to the inner surface of the tubular body to steady the chain-and-bucket conveyer, substantially as set forth.

5. The combination in a dredging apparatus with a chain-and-bucket conveyer and means for supporting and operating the same, of a tubular body surrounding and inclosing the chain-and-bucket conveyer and
50 extending down through a body of water and resting in and upon the sand or gravel bottom thereof, there being an opening in one side of the said tubular body at or adjacent to the lower edge, substantially as set forth.

6. In a dredging apparatus, the combination with a chain-and-bucket conveyer, a support therefor and means for operating the same, of a weight-wheel in the lower loop of the chain-and-bucket conveyer and around
60 which the lower portion of the same turns, a tubular body surrounding and inclosing the chain-and-bucket conveyer and passing down through a body of water and resting in and upon the sand or gravel bottom of the same,

and a guide connected to the axis of the weight-wheel and adapted to come adjacent to the inner surface of the tubular body to steady the chain-and-bucket conveyer, there being
70 an opening in one side of the said tubular body at or adjacent to the lower edge, substantially as set forth.

7. In a dredging apparatus, a group of tubular bodies passing down through a body of
75 water and resting in and upon the sand or gravel bottom thereof at their lower edges, means such as a platform for connecting the said tubular bodies at their upper edges, chain-and-bucket conveyers passing down
80 through the tubular bodies, supports therefor at the upper ends of the tubular bodies, and means for operating the chain-and-bucket conveyers, substantially as set forth.

8. The combination in a dredging apparatus with a chain-and-bucket conveyer and means for supporting and operating the same, of a tubular body surrounding and inclosing the chain-and-bucket conveyer and extending
85 down through a body of water and resting in and upon the sand or gravel bottom thereof, a clamp or collar surrounding the tubular body and having arms connected therewith and floats adapted to be placed under the said arms for raising or supporting
90 the tubular body, substantially as set forth.

9. The combination with an open-ended tubular body forming substantially a well-inclosure, of a chain-and-bucket conveyer extending down through the tubular body, a
100 support above the tubular body and resting thereon for the chain-and-bucket conveyer, and means carried by said support and independent of the movements or position of the tubular body for actuating the chain-and-
105 bucket conveyer, whereby the operation of the conveyer and the removal of the material within and at the bottom of the tubular body permit the same to sink by gravity and the conveyer and support to follow the tubular
110 body, substantially as specified.

10. The combination in a dredging apparatus, with an open-ended tubular body forming substantially a well-inclosure and extending down through a body of water, and
115 resting in and upon and supported by the sand or gravel bottom thereof, of a chain-and-bucket conveyer extending down through the water within the tubular body and adapted to engage and automatically elevate the materials at the bottom and bring the same up
120 to the surface, a support for the said conveyer resting on the tubular body and means for actuating the same whereby the tubular body sinks as the material within is removed
125 and the conveyer and support follow the tubular body, substantially as set forth.

Signed by me this 1st day of March, 1900.

F. ECAUBERT.

Witnesses:

GEO. T. PINCKNEY,
S. T. HAVILAND.