No. 785,125. PATENTED MAR. 21, 1905.

H. B. SHAFER.

WATER SCREEN.

APPLICATION FILED MAR. 6, 1904.

3 SHEETS—SHEET 1.

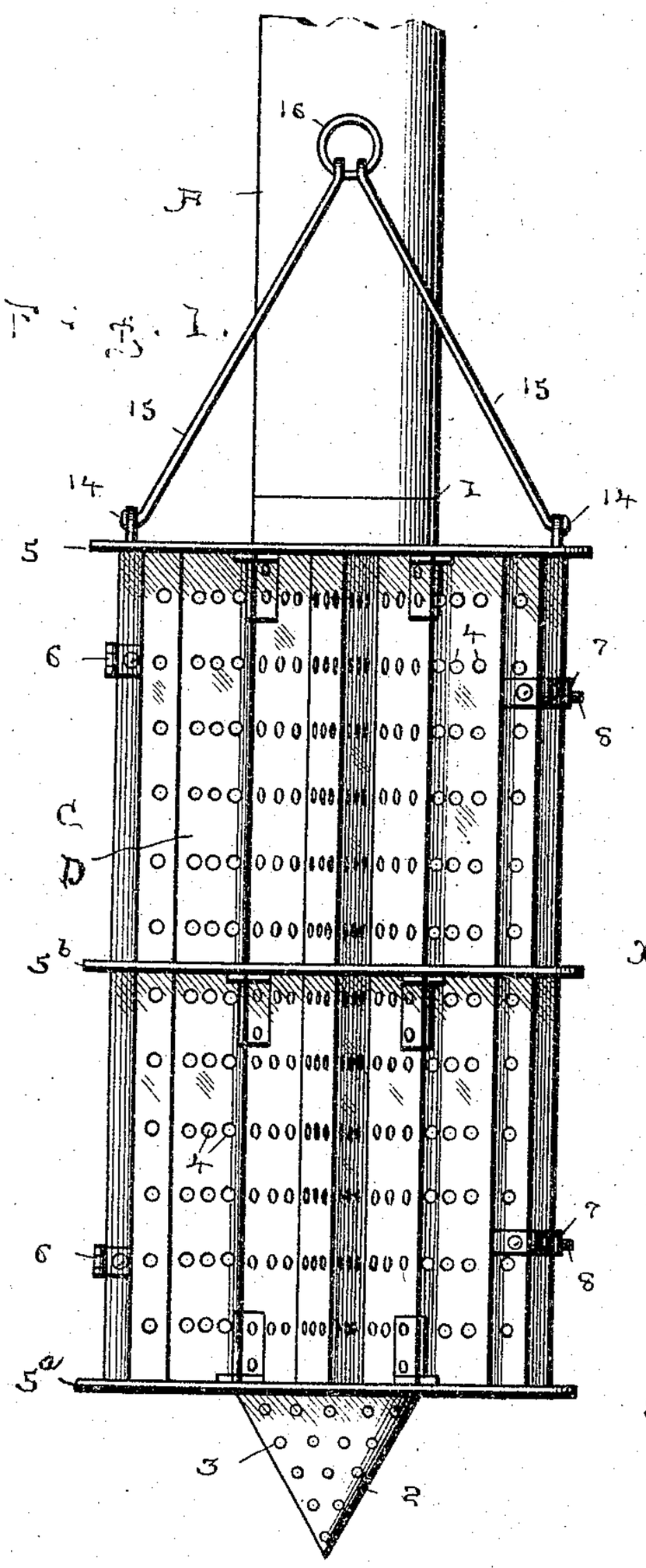

Fig. 1.

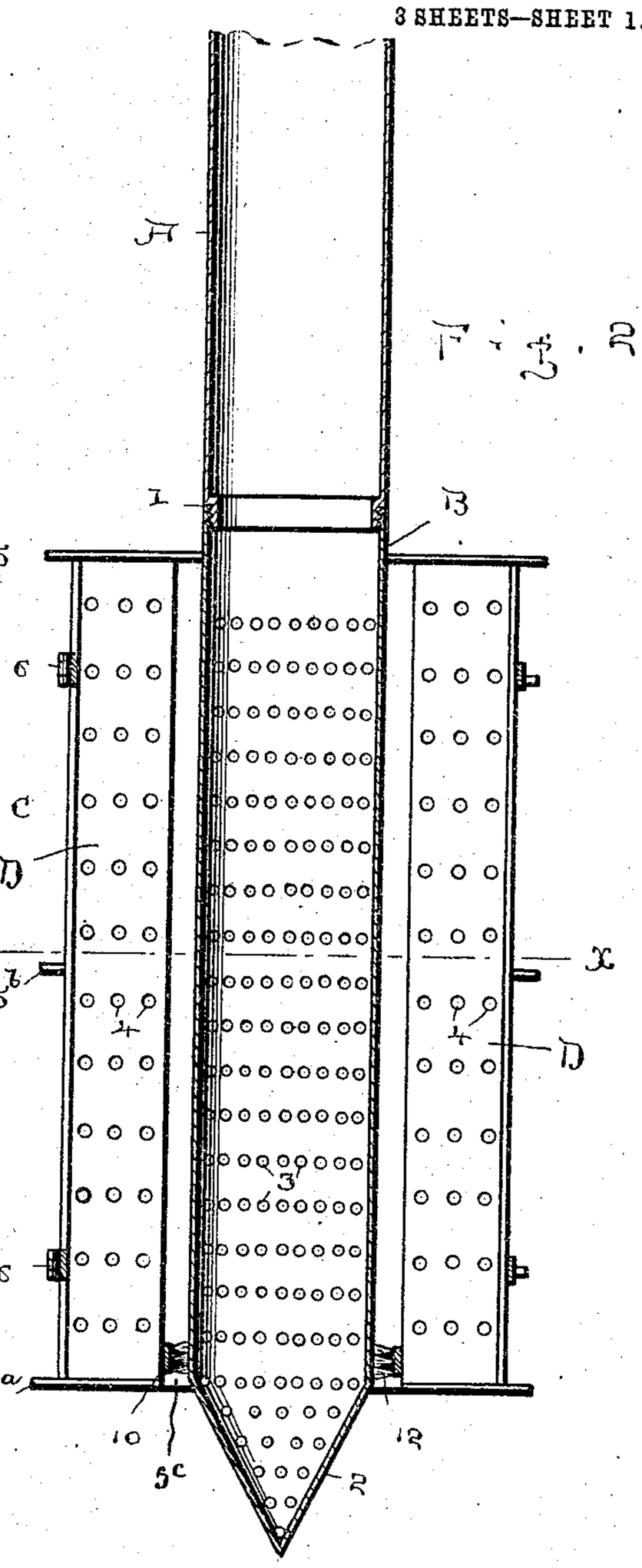

Fig. 2.

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3 SHEETS—SHEET 2.

Fig. 3.

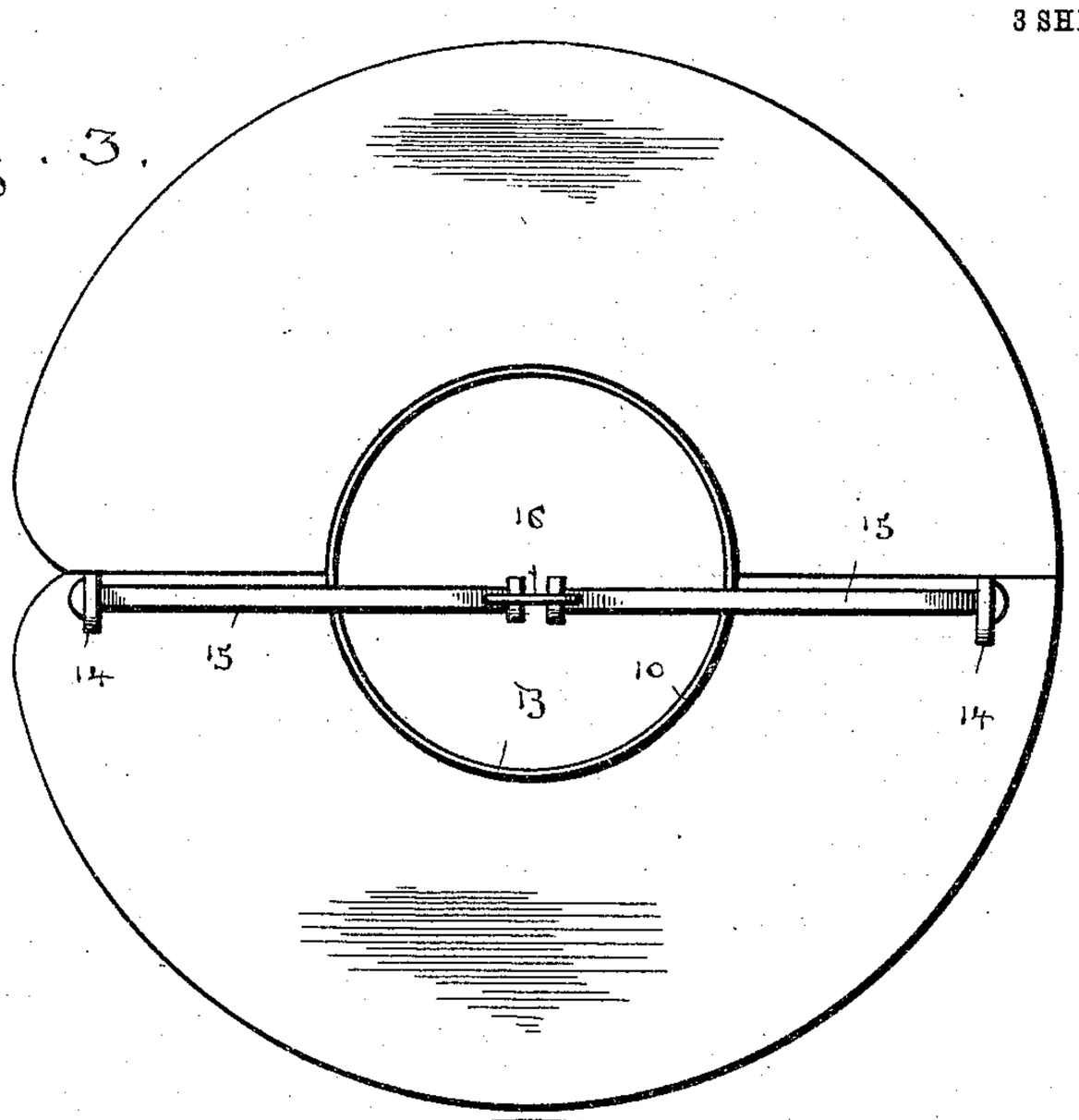
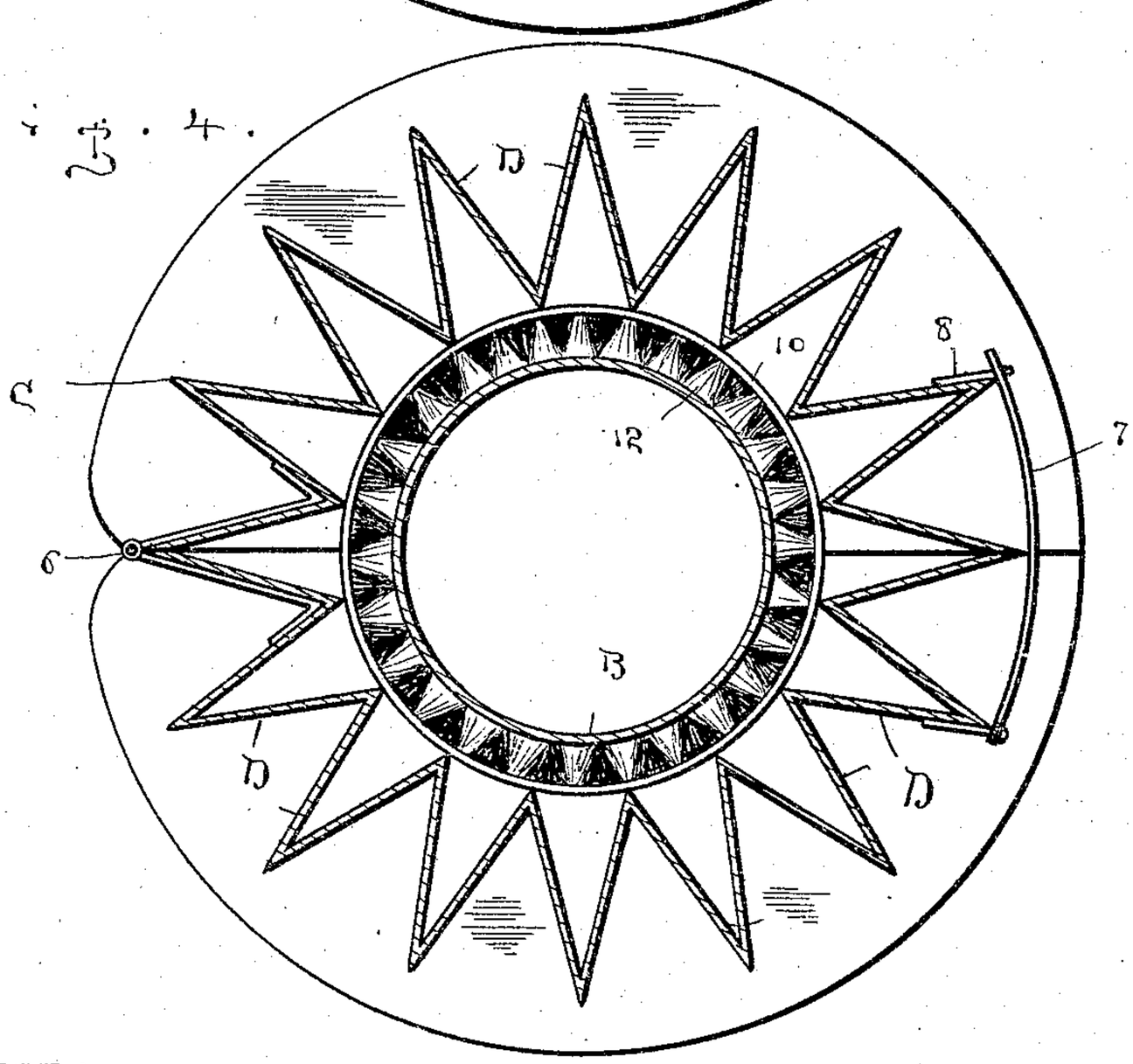


Fig. 4.



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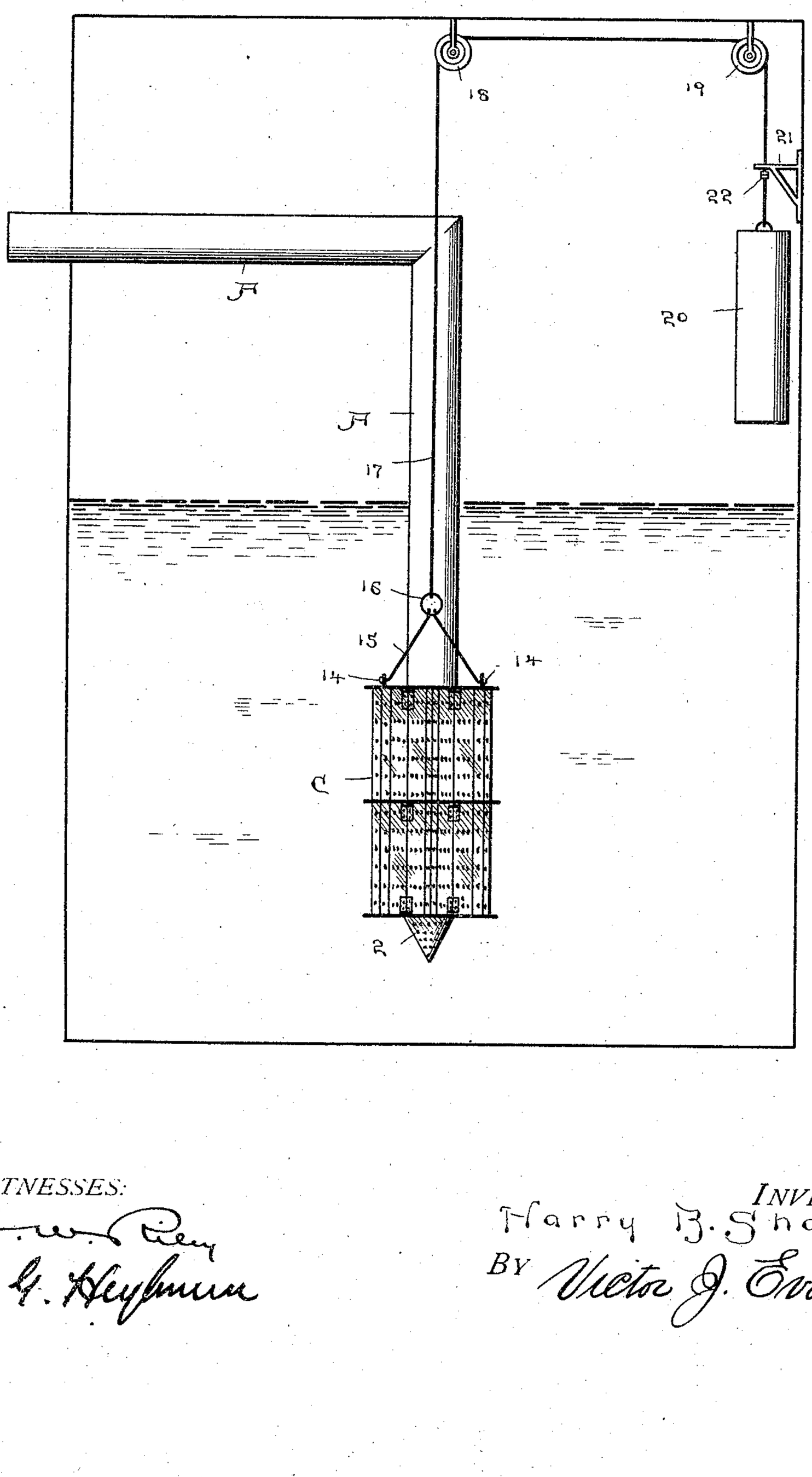
3 SHEETS—SHEET 3.

Fig. 5.



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UNITED STATES PATENT OFFICE.

HARRY B. SHAFER, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JONATHAN WAINWRIGHT, JR., OF WASHINGTON, DISTRICT OF COLUMBIA.

WATER-SCREEN.

SPECIFICATION forming part of Letters Patent No. 785,125, dated March 21, 1905.

Application filed March 5, 1904. Serial No. 196,869.

To all whom it may concern:

Be it known that I, HARRY B. SHAFER, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Water-Screens, of which the following is a specification.

This invention relates to screens or filtering-cages for suction-pipes; and the primary object of the same is to provide simple and effective perforate means which may be readily disposed in operative relation to the suction-pipe or analogous attachment of a pump to prevent the ingress of debris of all kinds and clogging of the strainer connection closing the entrance to the pipe.

A further object of the invention is to have the screen or filtering-cage slidably associated in relation to the suction-pipe or analogous device and provided with entrance-openings and to equip the screen or cage with a cleaning device always held in close contact with the pipe and operating to remove clogging sediment or accumulations from the exterior of said pipe.

The invention embodies, essentially, a slidable perforate cylinder having cleaning means to engage the pipe on which it is disposed.

The invention contemplates more specifically the use of a stellated or star-shaped cage for movably surrounding a pipe and perforated throughout its structure.

The invention still further embodies a novel detail construction and arrangement of parts, which will be hereinafter more fully set forth.

In the drawings, Figure 1 is a side elevation of the complete apparatus shown applied to the lower extremity of a suction-pipe. Fig. 2 is a central vertical section through the improved apparatus and the suction-pipe. Fig. 3 is a top plan view of the apparatus. Fig. 4 is a horizontal section taken on the line x x of Fig. 2. Fig. 5 is a diagrammatic elevation showing the suction-pipe and apparatus immersed and the means for raising and lowering said apparatus.

Similar characters of reference are employed to indicate corresponding parts in the several views.

A designates a suction-pipe, which is arranged to lead from a reservoir or water source to a suction or pumping mechanism, which, in other words, forms a part of a suction-pump. This pipe may be of such diameter or capacity as to suit or meet the demands of the pump connections and may be of any desired length. This pipe may be positioned vertically or have a bend or elbow to permit it to be arranged horizontally or inclined below or above a determined horizontal plane. One end of the pipeA has a perforated feeding-pipe B secured thereto, the present connection between these two pipes consisting of end-engaging screw-threads 1; but it will be readily understood that any other suitable connection may be substituted. The perforated feed-pipe B is of such length and diameter that it will practically serve the purpose intended and is provided with a conical terminal or lower end 2, which projects beyond the apparatus embodying the features of the invention. The feed-pipe B is provided with a plurality of perforations 3, which commence at a distance form the end of the pipe A and are formed regularly throughout the length of the feed-pipe and in the conical end 2.

C designates the outer screen or filtering-cage, which in the present instance is made up of a series of vertically-disposed radiating plates D, which converge toward their outer side edges to secure and present a stellated appearance in cross-section, as clearly shown by Fig. 4. The inner points or angles of this stellated screen or cage touch an imaginary circle of larger diameter than the suction-pipe to provide a space between the same and the pipe and allow the screen or cage to freely slide on the pipe. The plates D are

formed with perforations 4, through which the water finds access, and the screen or cage is shown as being composed of perforate metal plates. It will be understood, however, that an obvious equivalent therefor would be pieces of wire-gauze or other analogous mesh fabric.

The screen or cage C is strengthened by end plates 5 and 5^a and an intermediate annular brace 5^b, to which said plates are attached, the plate 5 closely engaging the pipes B and A and the plate 5^a having an enlarged central opening 5^c to permit the adjacent end of the screen or cage to readily clear the pipe B. In instances where the suction-pipe extends vertically to permit the screen or cage to be drawn upwardly out of the water said screen or cage may be made rigid; but in cases where there is an elbow or bend in the path of the screen provision must be made to permit the screen to pass the obstruction, and this is accomplished by making the screen in half-sections and hinging them together, as at 6, so that the sections can be swung open to pass the bend in the pipe and then afterward closed. The hinges 6 may be of any suitable form; but it is preferred that they be of the strap type and extend a sufficient distance over the plates D, which they engage, to insure strength and practicability of the hinge connection. Opposite the hinges the sections have gravity-latches 7, which are adapted to engage catches 8, the said latches and catches being secured to adjacent portions of the sections.

To the inner points or angles of the stellated screen or cage, at the lower end or adjacent to the opening 5^c in the plate 5^a, a vertical band 10 is secured, carrying inwardly-projecting wire brushes 12, which are held in continual close contact with the pipe B when the screen or cage is applied. These brushes extend entirely around the pipe B or the suction-pipe, as the case may be, and engage the outer surface of the pipe with sufficient pressure to effectually remove any sediment or accumulation thereon when the screen or cage is shifted longitudinally in the opposite direction with relation to the pipe engaged. By this means the openings 3 can easily be cleared and obstruction to the free entrance of water into the pipe B avoided.

The screen or cage is shown as applied in a vertical position; but it will be understood that a horizontal position thereof will be as effective in shielding the perforate pipe B or the perforate extremity of a suction-pipe from the detrimental influence of debris. It will also be understood that any suitable means may be employed for sliding the screen or cage on the pipe extremity, and one simple means for operating the screen or cage when in a vertical position is shown by Fig. 5 and consists of rings or eyes 14, arranged and secured on the plate 5 at diametrically opposite points, and to the said rings or eyes the lower ends of bails 15 are connected, the upper ends of said bails being secured to the ring 16, to which one end of the cable 17 is attached. The bails 15 have the function of links and connect, as shown, each with an opposing section, so that the weight of the cage will act to maintain the sections in closed relation. The cable 17 is passed over a groove or pulley 18 and thence over a pulley 19 and depends from the latter pulley and is attached to a weight 20 sufficiently heavy to effect the raising and lowering of the screen or cage, but not heavy enough to completely counterbalance the said screen or cage. The cable 17 between the pulley 19 and head of the weight passes through a holding-bracket 21, and to prevent the screen or cage from descending below the required point a stop is fastened on the cable to engage the under side of the arm of the bracket.

The plates D of the screen or cage are provided with inclined faces to obstruct the adherence of debris thereto, and the number of plates used, as well as the angular disposition thereof, will depend upon the general proportions of the several parts.

The metal used in forming the parts of the screen or cage may be of a non-corrodible nature or be suitably treated to prevent corrosion thereof.

Changes in the form of the screen might also be adopted at times without departing from the spirit of the invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a suction-pipe having a perforated extremity, of a perforated cage adapted to slide thereon, having its surrounding wall stellated transversely and in spaced relation to the suction-pipe, said cage having an upper head provided with an opening to admit the suction-pipe in bearing relation, and a lower head adapted to provide a passage around the suction-tube, and a cleaning device supported on the wall of said cage and arranged to extend across said passage, substantially as and for the purpose set forth.

2. In combination with a suction-pipe having a perforated extremity, of a perforated cage adapted to slide thereon in spaced relation thereto, a closure for the top of said cage, and a circular cleaning-brush carried by said cage and adapted to form a closure for the base-opening thereof, substantially as and for the purpose set forth.

3. In combination with a suction-pipe having a perforated extremity, of a perforated cage adapted to slide thereon in spaced relation thereto and provided with a series of

flexible projections extending therefrom in circular arrangement and adapted to enter the perforation of the tube extremity, substantially as and for the purpose set forth.

4. In combination with a suction-pipe, of a perforated cage adapted to slide thereon and comprising longitudinal sections hinged together, a flexible bail connecting said sections, and a suspending means for said bail, substantially as and for the purpose set forth.

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

HARRY B. SHAFER.

Witnesses:

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GEORGE M. BOND.