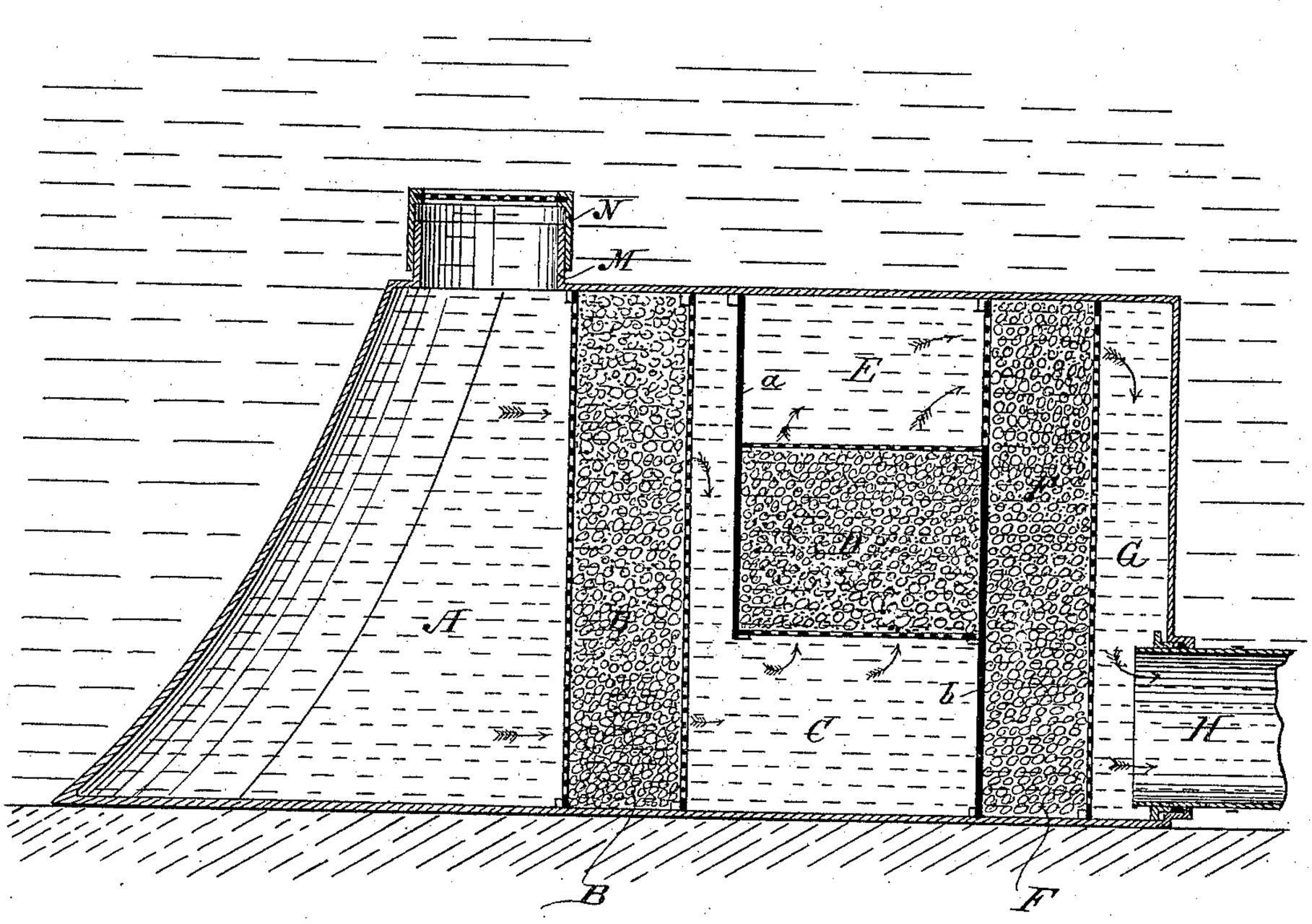
(No Model.)

R. H. BULL & H. H. HALL.

METHOD OF CONSTRUCTING WATER WORKS.

No. 344,813. Patented July 6, 1886.



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UNITED STATES PATENT OFFICE.

RICHARD H. BULL, OF NEW YORK, AND HAYDEN H. HALL, OF NEW HAMBURG, N. Y.

METHOD OF CONSTRUCTING WATER-WORKS.

SPECIFICATION forming part of Letters Patent No. 344,813, dated July 6, 1886.

Application filed February 25, 1886. Serial No. 193,225. (No model.)

To all whom it may concern:

Be it known that we, RICHARD H. BULL, of the city, county, and State of New York, and HAYDEN H. HALL, of New Hamburg, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in the Method of Constructing Water-Works and the Devices Employed Therein, of which the following is a description in such full, clear, concise, and exact terms as will enable any one skilled in the art to which our invention appertains, or with which it is most nearly connected, to make and use the same, reference being had to the accompanying drawing, and to the letters and figures of reference marked thereon.

Said drawing illustrates in vertical section a caisson of ordinary construction divided into compartments filled with filtering material and connected with a water-main, as will be hereinafter fully described.

In obtaining water for ordinary city or town purposes, where it is drawn from any considerable body of water—such as a lake or large river—it is often necessary, or at least desirable, to draw the supply at some distance from the shore, in order to obtain pure and unpolluted water. For this purpose pipes or water-mains of considerable length must be laid into the body of water, and heretofore a great deal of difficulty has been encountered and expense incurred in laying such pipes and providing them at their extremities with suitable filtering apparatus or devices.

Our invention is designed to provide a convenient, effectual, and cheap method of and means for constructing such works, and, further, to provide a filtering apparatus at the mouth of such tubes, and such as can be readily entered and cleaned or renewed whenever repair or cleaning is necessary. To this end we first lay a tube or water-main of the required size by means of a traveling caisson. Any form of caisson adapted to this purpose may be used, but we prefer to employ such a caisson as is described in the patent granted to Hayden H. Hall, dated February 3, 1885, and numbered 311,656, or such as is described in our application now pending in the Patent Office bearing Serial No. 193,209, filed February 25, 1886. One method of laying such tube is fully described in the patent and application named, to which reference is here made for a description of one method of and means for laying such pipe, and the one which we prefer to employ. No further description of the caisson and the method of employing it is deemed necessary here. When the tube which is to conduct the water to the storage-reservoir on shore has been laid, and while the caisson is still connected to its end, we permanently connect the tube to the caisson and firmly anchor the caisson. We then remove from the caisson all its machinery and other contents, and place in its interior filtering material or a filtering device most convenient and efficient for the purpose.

One form of filtering device is shown in the annexed drawing. A vertical water-chamber, A, is provided in the front end of the caisson, into which the water first enters. The water then passes horizontally through a compartment, B, filled with a filtering agent, into a second water-chamber, C, thence vertically and upward through a second filtering-compartment, D, into a third water-chamber, E, thence horizontally through a fourth filtering-compartment, F, to a water-chamber, G, communicating directly with a supply-pipe, H, the water in its flow through the caisson following the course indicated by the arrows. The heavy black lines *a* and *b* in the drawing indicate water-tight partitions and the heavy dotted lines perforated plates, which hold the filtering material in place. It will be seen that the first water-chamber, A, in which sediment and dirt naturally collect most rapidly, is comparatively large, and that it is a deep chamber, and that the water flows out of it horizontally through the filtering material B. Now, as sediment settles to and collects at the bottom of this chamber the flow of water through the filter is not materially obstructed until a large amount of sediment has collected in this chamber, since a part of the surface of the filtering-compartment remains unobstructed until the sediment entirely fills the chamber. It will be further observed that the impurities which enter the chamber C will fall to the bottom and leave the surface of the fil-

tering-compartment D clean and free until it entirely fills the chamber. The compartments B, D, and F should be filled with any suitable filtering material, the material in D being finer than that in B, and the material in F being finer than that in D. When the filter has been properly constructed, the ventilating or entrance pipe, which is fitted on the short pipe M while the tube is being laid, is taken off and a short pipe, N, provided with a screen-cover, is put on in its place, said pipe being made of the proper length to terminate in and receive its supply from that strata of water which is purest and best adapted for general use. The apparatus is then complete, and is in working order. If the filter should become fouled in use or need repair, the short pipe M is slipped off and the longer ventilating or entrance tube, previously described, is put on in its place, the water pumped out of the caisson, and the works cleaned, renewed, or repaired, as they may require.

Having thus described our invention, we claim and desire to secure by Letters Patent—

The method hereinbefore described of constructing water-works, which method consists of laying a submarine tube by means of a traveling caisson, which is moved ahead as the tube is built therein, of then fitting the interior of said caisson with a filtering device, and of then admitting water, substantially as described.

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