

No. 708,541.

Patented Sept. 9, 1902.

O. FRÜHLING.

HYDRAULIC DEVICE FOR EMPTYING DREDGING SCOWS.

(Application filed Nov. 5, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

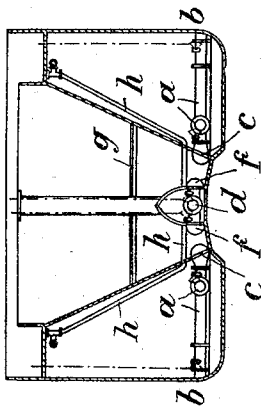


Fig. 2.

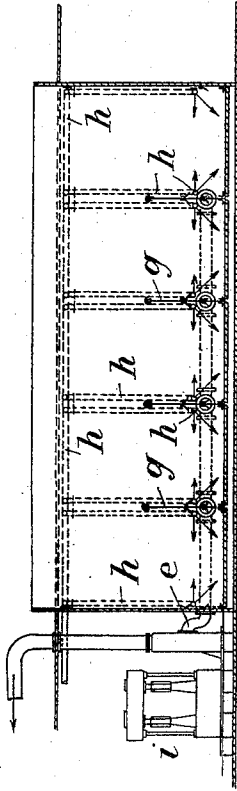
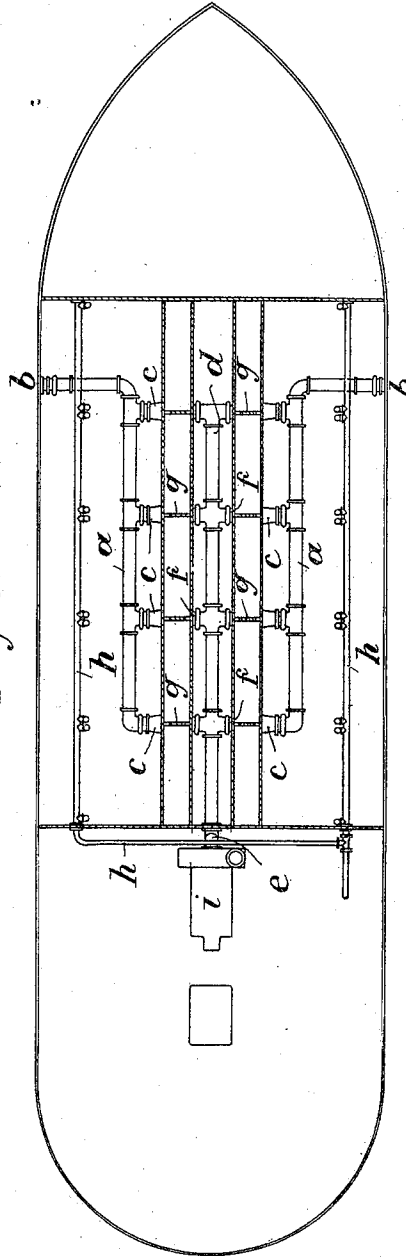


Fig. 3.



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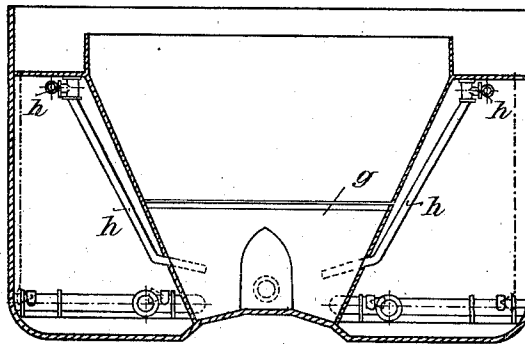
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2 Sheets—Sheet 2.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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HYDRAULIC DEVICE FOR EMPTYING DREDGING-SCOWS.

SPECIFICATION forming part of Letters Patent No. 708,541, dated September 9, 1902

Application filed November 5, 1900. Serial No. 35,475. (No model.)

To all whom it may concern:

Be it known that I, OTTO FRÜHLING, of the Duchy of Brunswick, residing at the city of Brunswick, in the German Empire, have invented a certain new and useful Device for Emptying Dredge-Boats by the Application of Suction, of which the following is a specification.

This invention has reference to means for emptying dredge-boats and for transferring the sludge therein contained to the place of deposit, which being either situated on land or being shallow places in rivers and seas are inaccessible to the ships.

The invention will be explained with reference to the accompanying drawings, which represent a construction embodying my invention, Figure 1 being a cross-section, and Fig. 2 a longitudinal section, of a preferred form of construction, and Fig. 3 being a plan. Fig. 4 is a cross-section through the boat.

a a d are two systems of piping placed at the bottom of the hold of the vessel, either on the floor of the storage-room proper or inside of the rooms contiguous thereto. The piping *a* empties into the sea at *b* and is connected with the storage-rooms at *c*, while the other system of piping *d* is connected at *e* with a dredge-pump of ordinary construction, the other extremity *f* of the piping opening into the storage-rooms. Each two corresponding openings *c* and *f* entering the storage-rooms are arranged opposite each other, whereby when the system of piping *a* communicates with the sea and the piping *d* with the dredge-pump a stream of water is made to flow by suction as soon as the pump is started from the system of piping *a* into the piping *d*. The conduit *d* is arranged amidships and is situated between the double conduit *a*, arranged on either side thereof, as represented in the preferred form of construction shown on the accompanying drawings. The openings *c* and *f* are at such distance from each other that when the storage-rooms are filled the sludge between the openings *c* and *f* will be prevented from stopping up the opening *f* and from interfering with the suction of the current from *c* in the direction of the opening *f*.

In order to provide additional means for keeping the openings *f* free for insuring the

passing of the current of water from *c* to *f* under any conditions, I make use of webs *g*, which are arranged between the openings *c* and *f* and which are so shaped as to prevent the deposit from forming one compact solid mass between the said openings. I also arrange conducting-pipes *h* for water under high pressure between the openings *c* and *f* and which serve to loosen the sludge depositing between the said openings by powerful jets of water under pressure, thus providing a passage for the water flowing from *c* to *f*.

The several openings of the conduits *a* and *d* may be closed up independently of each other, so that when the dredge-pump is on the suction may induce a current either between several series of openings *c* and *f* or only between one of them. Short pieces of piping or taps are inserted into the openings *c* and *f*, which branch off from the pipes *a* and *d* and which are adjustable, so as to be able to regulate the force of the suction and the quantity of water which it carries. I arrange so many pairs of openings *c* and *f* and dispose them about the hold of the ship in such a manner that I am enabled by opening and closing the outlets correspondingly to direct a suction-current to any part of the storage-room or to prevent the current to enter any other part of the hold.

Fig. 4 illustrates the separating-walls *g* and the pressure-water conduits *h*. The partitions *g* are low separating-walls which, as shown in the drawings, occupy less than half the height of the dredge-boats. These low partitions are made of iron and are situated exactly in the plane of the opposite pipe-openings *c* and *f*. The partitions reach into the space between the short pipes and nearly to the end of the same. The partitions *g* are for the purpose of preventing the sludge from becoming packed together just in the plane of and in front of the openings *c f* of the pipes. Since the iron partitions are very thin, the free-operating section of the pipe-openings remains open for the suction of the dredge-pump. Thus the sludge mixture is admitted to the suction-opening *f* of the suction-pipe from both sides of the separating-walls *g* in front of them, which greatly facilitates the suction as compared with the construction where a compact mass of sludge is packed

between the pipe-openings *c* and *f*. In case the sludge in the dredge-boat should have become rather compact at the bottom in consequence of being stored for a long time the pressure-water conduits *h*, which are situated underneath the top of the boat, are employed for loosening the sludge. For this purpose a pair of conduits branch off from the upper conduits and extend along the free space between the pipe-openings *c* and *f*. By the opening of a stop-cock in connection with the conduit the compact sludge between the openings *c* and *f* is softened by the pressure-water flowing into it, and after being softened it is delivered to the suction-pipe of the dredge-pump, which is then started.

The device operates as follows: Suppose storage-room to be filled with sludge which is to be dumped. I then first connect the system of piping *d* at the point *e* with the dredge-pump *i*, while the piping system *a* is put in communication with the outside water at *b*, whereupon one of the pairs of openings *c* and *f* are opened and the pump is started. If necessary, the corresponding pressure-pipes *h* may also be opened in order to facilitate the formation of the current of water by suction through the sludge accumulated in the storage-room. The current will then flow through the sludge on the bottom of the vessel and will carry it to the dredge-pump to be ejected through the pipe-conduits. The outlets *c* and *f* are first opened at one end of the storage-room to be emptied, and in accordance with the progress of the emptying operation the other pairs of openings toward the other extremity of the storage-room are opened. When there is not sufficient sludge left to be taken up by a particular pair of openings, the latter are closed. Inasmuch as the openings are so arranged that any part of the storage-room desired may be operated upon, the emptying operation is very thorough and may be regulated at will. The storage-rooms for the reception of the sludge may be contained in the same vessel with the dredge-pump as in the construction shown in the drawings or the storage-rooms and the dredge-pump may be placed on separate vessels. In this case the dredge-boats proper are posted as near as possible to the vessel or scaffold on which the dredge-pump has been placed. After the connection with the said pump is established at *e* the emptying operation may be carried on.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. A device for removing the sludge by suction from the sludge-rooms of ships and dredge-boats, comprising the combination of two systems of pipe-conduits *a*, *d*, parallel to each other and longitudinally arranged within the ship, one of the said pipe-conduits having connection with the dredge-pump, while the other pipe-conduit is open to the outside, both pipe-conduits being provided at the bottom of the storage-rooms with a great number of short pipes *c*, *f*, which are so arranged that two of them are situated in the same axis and which open out opposite to each other and which may be opened or closed separately, in order to be able to take up the sludge from all points of the boat, substantially as specified.

2. A device for emptying and dumping sludge from dredge-boats, comprising the combination with the dredge-pump, of two systems of piping in communication with the seawater and with the dredge-pump respectively, side outlets in the said pipes, opening into the hold of the ship or vessel, and webs and high-pressure conduits arranged between said outlets to prevent the stopping up of said outlets and to keep the sludge in a loose condition and open the way for the currents of water sucked through the said sludge, substantially as described.

3. In a device for emptying dredge-boats, the combination of a pipe that communicates with the water and has lateral outlet-openings, with a second pipe that is adapted to be connected to a dredge-pump and has lateral inlet-openings, arranged opposite the lateral outlet-openings, substantially as specified.

4. In a device for emptying dredge-boats, the combination of a pipe that communicates with the water and has lateral outlet-openings, with a second pipe that is adapted to be connected to a dredge-pump and has lateral inlet-openings, and with webs arranged between the openings, substantially as specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

OTTO FRÜHLING.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.