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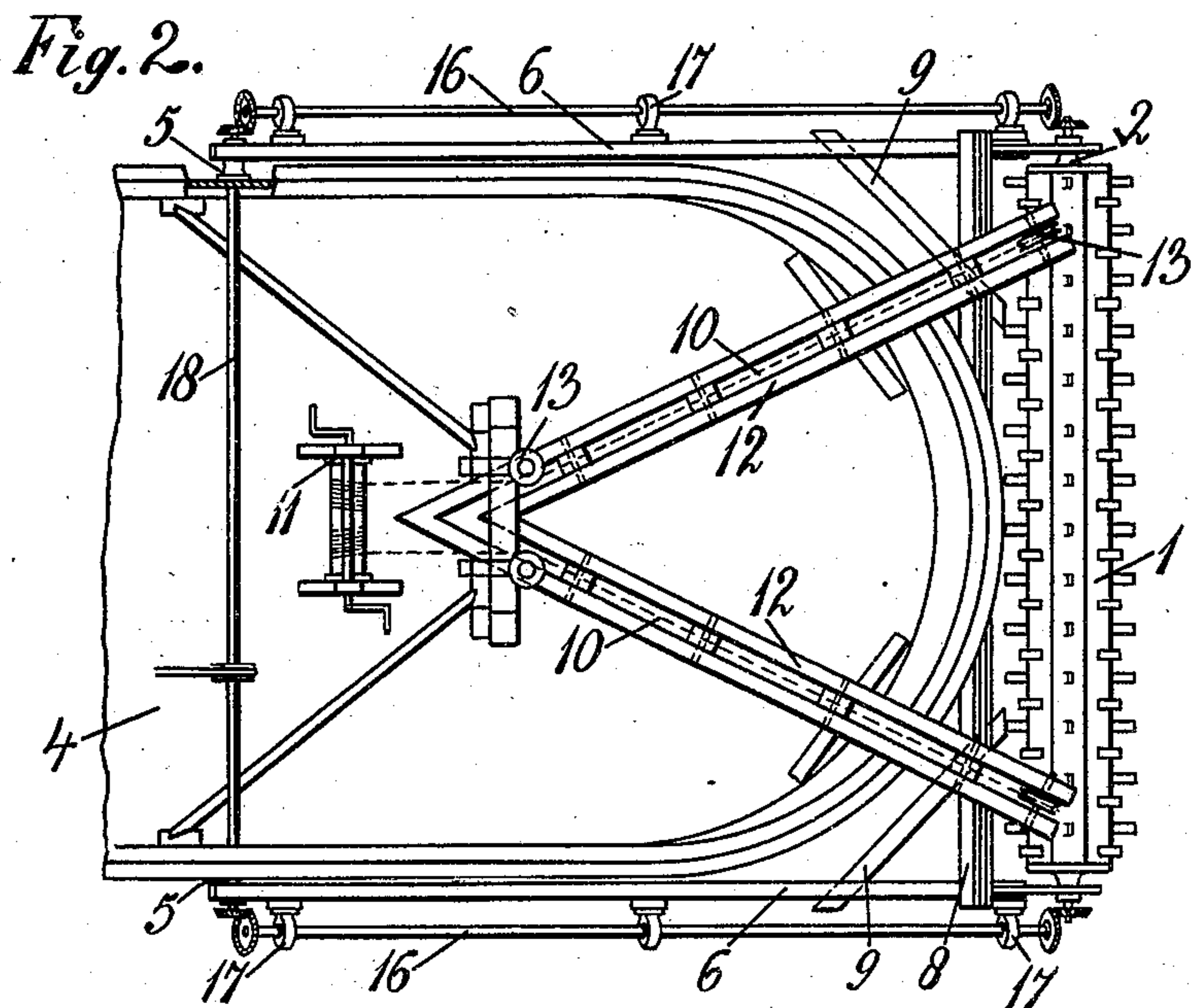
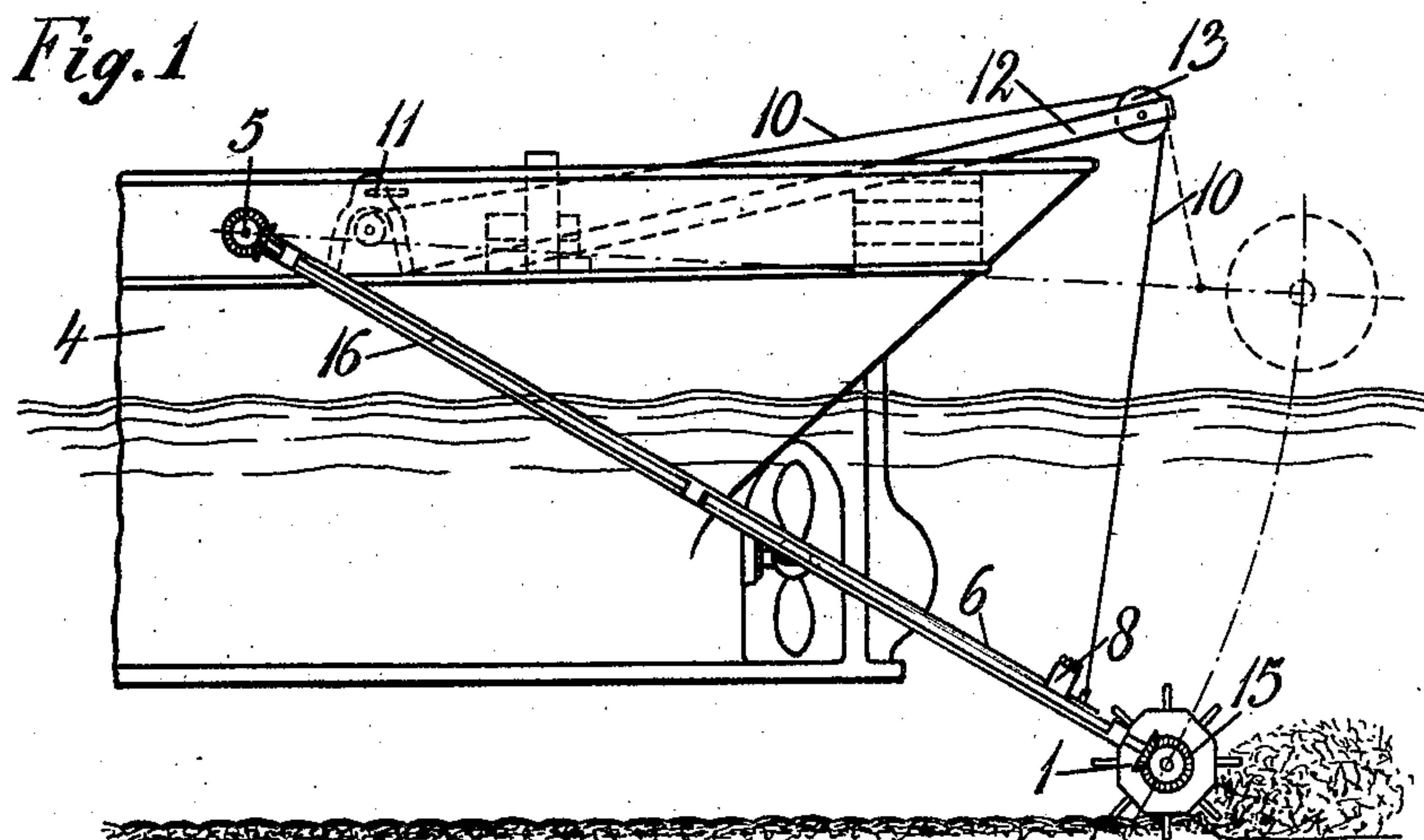
PATENTED JAN. 14, 1908.

J. P. ERMELING.

APPARATUS FOR REMOVING MUD FROM CHANNELS.

APPLICATION FILED JUNE 29, 1907.

2 SHEETS—SHEET 1.



Witnesses

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Fig. 3.

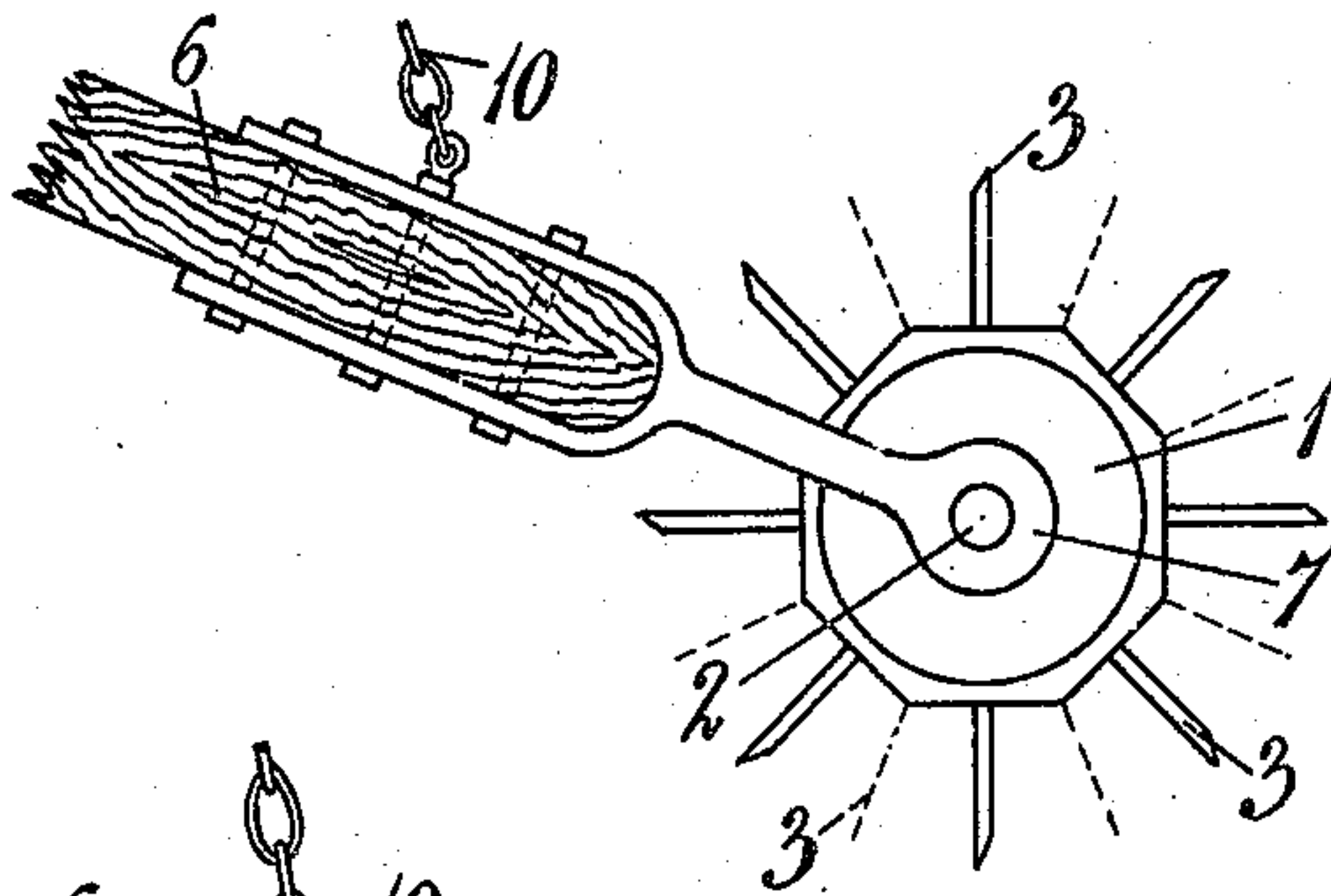


Fig. 4.

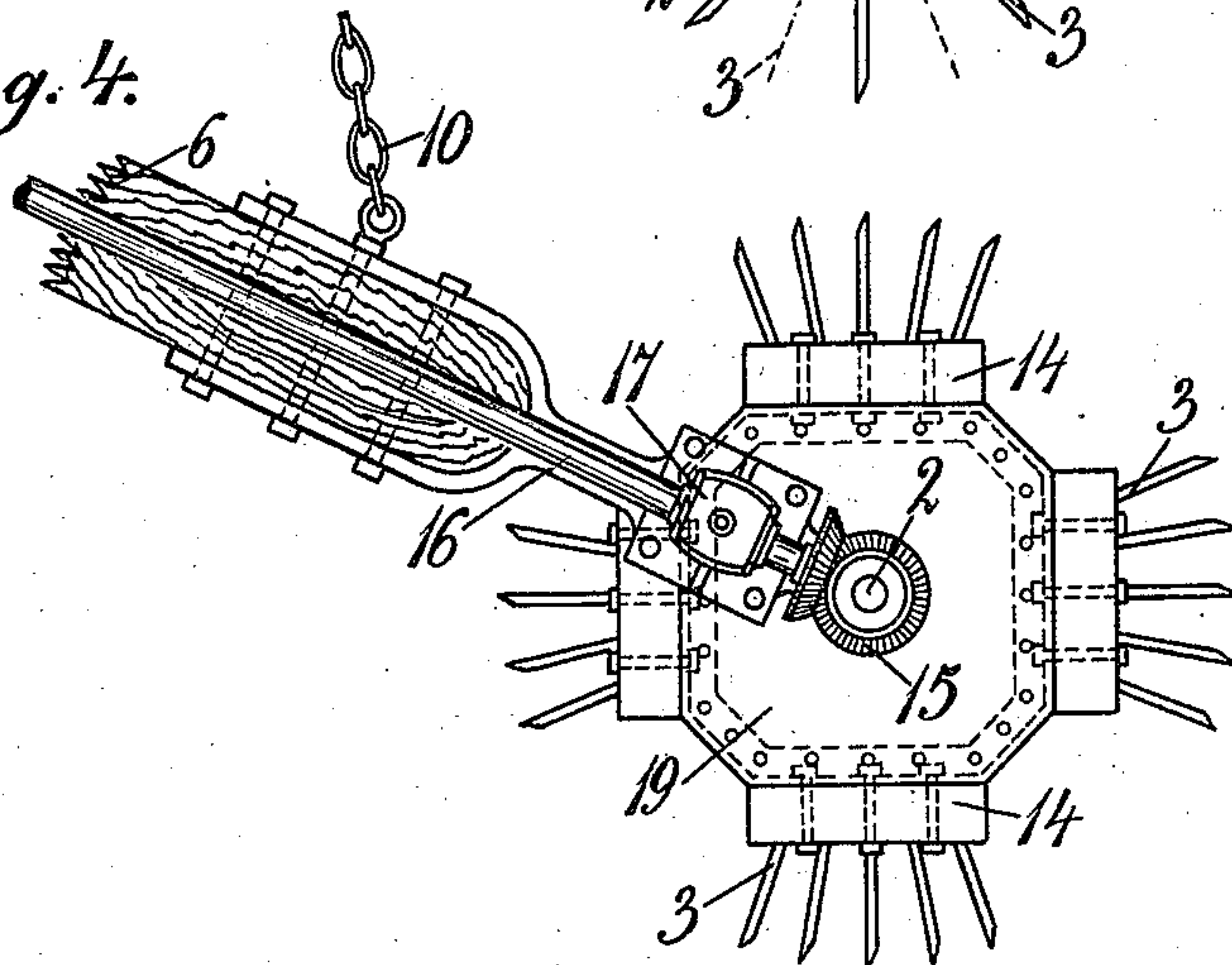
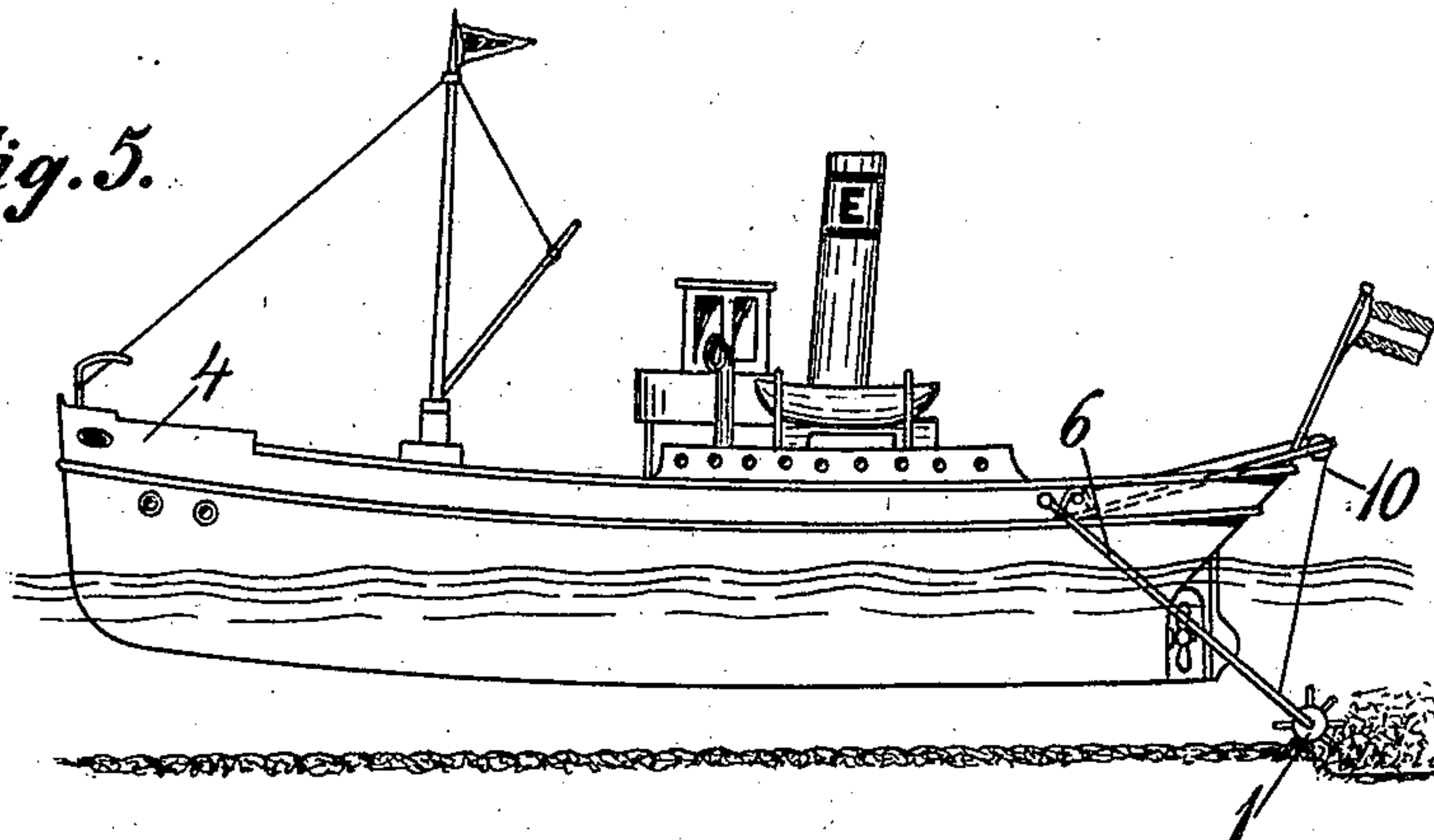


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHANN PHILIP ERMELING, OF BUITENZORG, JAVA.

APPARATUS FOR REMOVING MUD FROM CHANNELS.

No. 876,790.

Specification of Letters Patent.

Patented Jan. 14, 1908.

Application filed June 29, 1907. Serial No. 381,532.

To all whom it may concern:

Be it known that I, JOHANN PHILIP ERMELING, retired major-general in the Dutch Colonial Army, a subject of the Queen of the Netherlands, residing at Buitenzorg, Java, Dutch East Indies, have invented certain new and useful Improvements in Apparatus for Removing Mud from Navigation Channels and the Like Operations, of which the following is a specification.

In the methods hitherto known for the purpose of removing the soft mud that is carried along by rivers and is deposited on the sea bottom at the mouths of rivers, there are employed in addition to bucket chain dredgers, rotary scoop dredgers, and the like, also in many cases suction dredgers. The latter are suitable for very soft masses of silt, and particularly for dredging out the mud from the banks of silt, so as to form navigable channels therein. But this kind of apparatus is rendered very costly in operation by reason of the frequency of repairs and the efficiency or output is low.

Now the present invention consists in carrying out the principle of removing these masses of silt by the help of the regularly recurring flood and ebb currents or tides.

Navigation channels in accumulated deposits and in sand banks produced by floods, can be kept free from mud automatically within certain limits by the force of the tides themselves, if the masses of silt are stirred up in a suitable manner. In this stirring up the fine small particles of mud are mixed intimately with the lowermost stratum of water of the tidal stream and are conveyed by it into the deeper parts of the sea, or at any rate away from the channel.

The present invention which is based on the aforesaid principle, comprises in accordance therewith an apparatus which will effect the stirring up in a suitable manner according to the nature of the silt masses, the nature of the ground or bottom, and the position and depth of the same.

The apparatus consists of a cylinder adapted to rotate and having its surface capable of being modified according to the requirements of use in each case; it is attached to the stern of a steamship by means of tie-rods in a suitable manner. By means of this steamship this cylinder is rolled over the silt masses, whereby the scoop-like projections with which it is provided, stir up the soft mud bottom and at the same time bring the surround-

ing stratum of water into contact therewith, whereby the stirred up mass of mud is mixed intimately with the said stratum. Then the regularly recurring tidal currents act to convey the freely suspended mud particles into deeper water. This cylindrical wheel, hereinafter referred to as the "mud wheel", may be fitted with self-propelling means or not, according to the nature of the bottom. In the latter case its motion, or velocity of rotation, is dependent on the speed of the steamer, while in the former case its own motion is independent and may be varied and regulated in accordance with the nature of the bottom.

A constructional form of the mud wheel with its mounting is illustrated in the accompanying two sheets of drawings in which

Figure 1 is a side elevation of the stern of a steamer with a mud wheel apparatus. Fig. 2 is a plan of Fig. 1; Figs. 3 and 4 illustrate two different modifications of the mud wheel in elevation; and Fig. 5 is a general elevation of a steamer fitted with a mud wheel.

The mud wheel consists substantially of an octagonal wooden, solid or hollow cylinder 1 (Fig. 3), which is provided with two journals 2. Blades 3 having sharpened edges are fitted in a suitable manner in this wooden body. Eight rows of such blades are shown in Fig. 3, but more sets of blades may be employed, according to the nature of the bottom, as indicated by dotted lines in Fig. 3. The arrangement of the blades is further such that the rows of blades are staggered relatively to one another (Fig. 2). The mounting of the mud wheel on the steamer is as follows:—The steamer 4 is provided with two journals 5 (Fig. 2) on which are pivoted the inner ends of two wooden stays 6. The free ends of these stays are provided with an iron mount which terminates in an eye 7. The journals 2 are mounted in a suitable manner in these eyes. The stays 6 are secured against lateral shifting by a cross beam 8 and diagonal stays 9. The iron mount is also provided with an eye for the attachment of a chain 10.

The hoisting apparatus for lowering the mud wheel to any desired level, consists substantially of a windlass 11, and two jibs 12 arranged divergently over the bulwarks. These jibs consist of two beams coupled together, and carry guide rollers 13 over which the chains 10 run. By paying out or drawing in the chain, the mud wheel can therefore be set for any desired depth, and the

links of the chain may be marked in a suitable manner for the purpose of determining the depth at any moment.

If desired, the wooden cylinder may be replaced by, for instance, an octagonal sheet metal box or casing, or as shown in Fig. 4 four rectangular wooden beams 14 are used which are connected together in a suitable manner by means of head or end plates 19 that are suitably shaped and serve to carry the journals 2. The blades 3 are then arranged on the wooden beam 14. If the mud wheel is to receive self-propulsion, there is suitably arranged on the journals 2, a bevel wheel 15 which is geared with a driving shaft 16 journaled in bearing blocks 17 along the tie rod 6. The two shafts 16 are driven by means of a mainshaft 18 from an auxiliary engine (Fig. 2).

Instead of by the bevel wheel gearing shown, the mud wheel may be driven directly by chains and chain wheels, or other suitable means.

In order to enable the mud wheel to be weighted according to the nature of the silt masses to be treated, the cross beam 8 may be weighted in any suitable manner.

The manner of operating the apparatus is as follows:—During the ordinary journey of the towing steamer the mud wheel is drawn up and is kept in the position shown in dotted lines in Fig. 1. When the steamer has arrived at the site of operations where the silt banks are situated, the chain is paid out until the wheel has touched the bottom. The weight of the wheel forces the blades into the soft silt. If the mud wheel has no self-propulsion (Figs. 3 and 5), the steamer is allowed to drift with the same speed as that of the tide currents which are running at the time. By the motion of the wheel which is produced by this means the silt masses are stirred up and a whirling motion is imparted to the lowermost strata of the water with the result that the silt becomes dissolved or suspended in said strata of water. Then the mud particles which are kept in suspension by this means are carried out to sea by the tide currents. When the steamer is moving with the stream, the driving force of the water is sufficient; but in going against the

stream the steamer is given a suitable speed of travel. The effect of the mud wheel on very soft silt banks may be increased to a greater degree, by increasing the speed of travel of the steamer or increasing the diameter of the wheel, or weighting it more. It has been found in the case of hard silt masses, that it is preferable to provide the mud wheel with self-propulsion. In such a case, an auxiliary engine drives the main shaft 18 with greater or less speed according to the speed of the steamer. The depth of the agitated stratum of water is increased considerably thereby, and the blades act partly by breaking away and partly by stirring up, on a greater quantity of mud, whereby the mingling with the water is considerably increased.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim:—

1. An apparatus of the class described, comprising members pivotally connected at opposite sides of a vessel, a drum having a plurality of blades arranged in staggered relation to one another rotatably mounted at the free ends of said members, mechanism coöperative with said drum for rotating the same, an outwardly diverging pair of jibs having guide pulleys, a hoisting windlass, chains connected to said members passing over the pulleys and adapted to be wound upon the windlass to regulate the position of the drum, and braces for said members.

2. An apparatus for removing mud from navigation channels comprising a pair of stays pivotally supported at one end on each side of a vessel, a drum rotatably mounted between the outer ends of the said stays and provided with a plurality of blades, a pair of chains attached to said drum, a hoisting windlass for said chains, and a divergent pair of jibs carrying guide pulleys for said chains, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHANN PHILIP ERMELING.

Witnesses:

H. E. BECKER,
D. J. DU KINDERER.