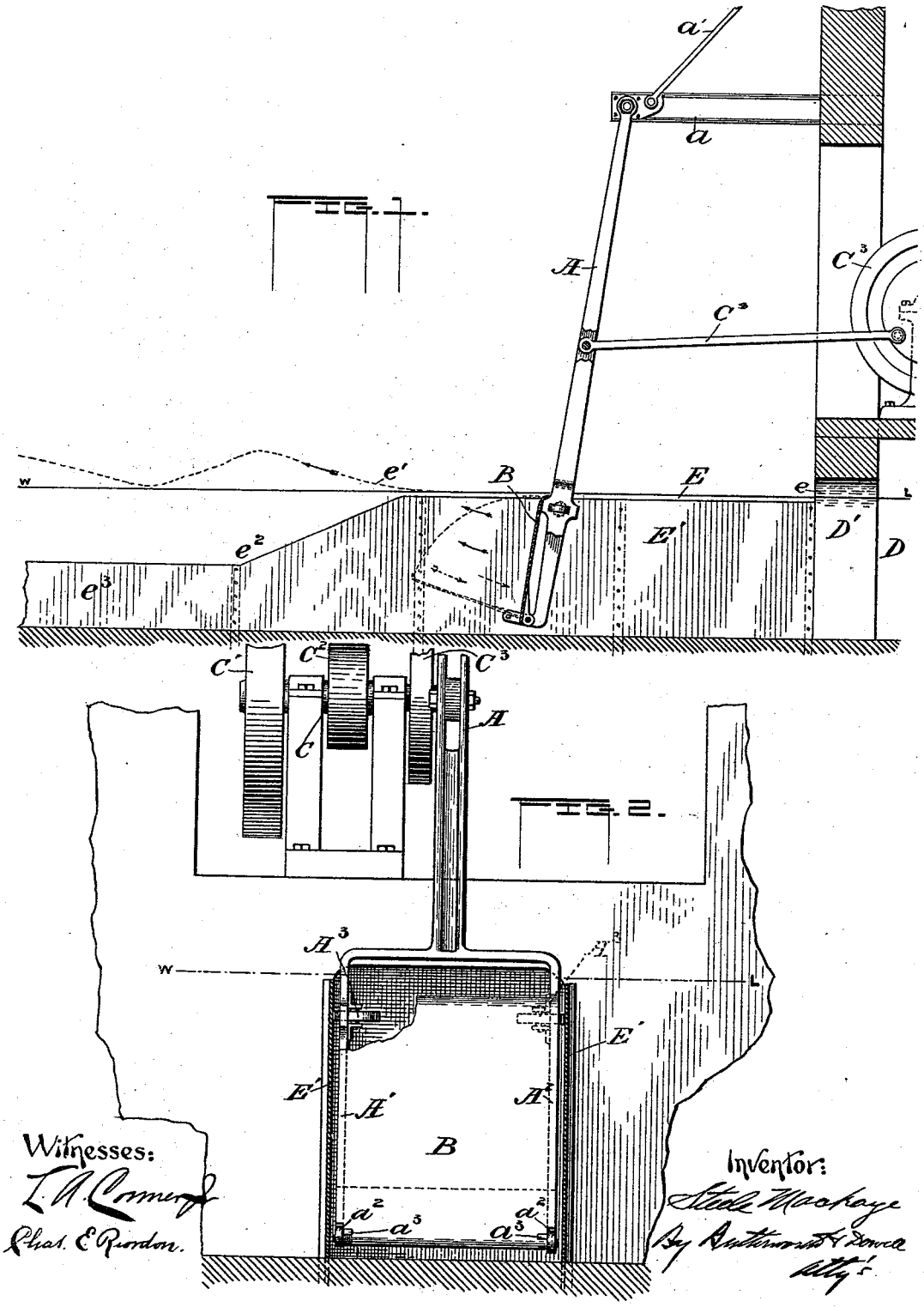
(No Model.)

S. MACKAYE.

WAVE MAKER.

No. 490,484. Patented Jan. 24, 1893.



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UNITED STATES PATENT OFFICE.

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WAVE-MAKER.

SPECIFICATION forming part of Letters Patent No. 490,484, dated January 24, 1893.

Application filed May 25, 1892. Serial No. 434,292. (No model.)

To all whom it may concern:

Be it known that I, STEELE MACKAYE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wave-Makers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in theatrical appliances, and the object of the invention is to provide means for producing waves upon the surface of a body of water confined in a tank or other means, or upon an artificial lake or any suitable body of water.

The invention is particularly designed for use in producing wave effects similar to those due to natural causes on large bodies of water and for the purpose of assimilating nature as nearly as possible in disturbing the surface of the water so as to give the effect of a gentle wave or a succession of waves or a "choppy" or rough and stormy sea.

Various contrivances may be employed for accomplishing such results, but a preferred form of device for this purpose is illustrated in the accompanying drawings, which form a part of this specification.

Referring to the drawings, in which similar letters of reference are used to denote similar parts, Figure 1, is a side elevation of a wave-maker embodying my invention; and Fig. 2 is a front elevation of the same.

A, denotes a vibratory arm or pendulum-lever which may be pivoted at its upper end to a bracket or support a, projecting from the wall or other fixture of the building in which the device is used; the bracket a, being braced in any suitable manner, as by means of a diagonal brace a'.

B, denotes a wave-plate or blade which is pivoted to the depending end of the lever A in such manner that on the forward movement of the lever the plate will be thrown into an upright position as indicated in full lines in Fig. 1, so as to push or force the water in advance thereof, and on the reverse movement will drop down into the position indicated in dotted lines in said figure, so as to move back freely without forming a wave.

The lever A may be formed or provided with yoke-arms A', A^2, or at its lower end to the free ends of which the wave-plate B is pivoted. Said arms are also provided with angular forward extensions a^2, a^2, to which are secured inwardly projecting pins a^3, a^3, which form supports for the wave-plate B when the latter is turned down into the position shown in dotted lines in Fig. 1.

C, denotes a power shaft which is mounted in suitable bearings above the wave-plate, and is provided with a fly-wheel C', a drive pulley C^2, and a crank-wheel C^3.

C^4 denotes a rod or pitman which connects the crank-wheel C with the lever A, intermediate the ends of the latter. The band wheel or pulley C^2, may be connected with any suitable source of power for imparting motion to the shaft C and thence to the lever A, so as to cause the latter to vibrate for the purpose of producing the waves. The rod C^4, and lever A preferably provided with a series of perforations a^5, a^6 by which they may be adjustably connected so as to vary the sweep of the lever to meet the various requirements in producing light or heavy waves at will.

For the purpose of controlling the direction of motion of the waves and to facilitate the formation thereof, I provide the bottom of the tank or reservoir containing the water upon which the wave effects are to be produced with suitable channels which may extend across the bottom of the tank in any desired direction either in a straight line or in suitable curves as may be desired, according to the requirements of the use to which the invention is to be put or the effect it is desired to produce. For this purpose I have shown a channel leading from the water supply or conduit D, across the bottom of the tank or reservoir, which as will be understood is located behind the proscenium opening in full view of the audience. The channel may be formed by means of side plates E, E, of sheet metal or other suitable material, which have their lower edges fixed to the bottom of the tank or foundation upon which the body of water is supported at either side of the wave-plate B, in the form of a trough of suffi-

cient width to permit the vibratory movements of the wave plate and lever without unnecessary friction and so as to confine the water in the trough or channel on the forward movement of the wave-plate. For a suitable distance, usually about the length of the arc of the circle described by the lower end of the liver A in its vibratory movements as from e to e' Fig. 1, the side plates E extend upward nearly to the water line indicated by the line W—L. From e' to e^2 the plates are inclined downwardly beneath the water line, and from the latter point they extend in the reduced form shown at e^3, which is about half the depth of the water in the tank or reservoir, the desired distance and in the desired direction to control the course of the wave-currents but without forming obstructions which may interfere with any object that may be floating upon the surface of the water, as for instance, a floating stage on which scenic-effects may be exhibited. By this means when the lever A is set in motion waves may be built up, as indicated by the curved dotted lines in Fig. 1, when the lever A is vibrated, by drawing the water from the conduit D through the inlet D', into the channel E, and forcing it along at each forward movement of the wave-plate B.

To prevent the arms A', A^2, of the lever A, from coming in contact with the side plates E', of the channel E, and to relieve these parts of friction, said arms are provided with transverse slots through which project the peripheries of friction rolls A^3, A^3, which have their axles journaled in suitable brackets secured to the inner sides of the arms on opposite sides of the slots, as indicated in Fig. 2.

It will be understood, of course, that a series of channels may be and ordinarily are provided, connecting the conduit D at one side or end of the tank or body of water with a similar conduit at the other side or end, and that the wave-plates and operating mechanism may be duplicated at the opposite ends of the channel, for the purpose of causing the waves to move in either direction or for the purpose of forming opposing waves.

While I have shown the wave-plate as being attached to a depending pendulum-lever, or a lever of the third order, it is manifest that a lever of either class or order may be employed, and that the connections between said lever and the power shaft may be varied in a number of ways; the means by which the wave-plate is actuated being unimportant. Good results may be produced by pivoting the wave-plate intermediate the ends thereof so as to form a "teeter," which may be made to oscillate by any suitable actuating arm or lever, or the lower edge of the plate may be pivoted to a fixed support or to the side plates of the channel E, so as to have a pedal-like motion, which may be imparted by means of a reciprocating rod or lever, as for instance the pitman connecting with the crank wheel or arm on the driven shaft. It may also be desirable to actuate the wave-plate by the direct action of the operating arm or lever, in which case the wave-plate may be hinged intermediate its ends to a sliding head or carriage and a horizontally arranged operating arm may connect with the lower edge or shorter arm of the wave-plate below the pivotal support thereof, so that on the forward movement of the operating arm or lever the wave-plate will be thrown into a vertical position by the positive action of the operating arm and the opposing force of the water acting on the side of the plate opposite its pivotal connection to the operating arm.

Various other modifications may be made in the details of construction and arrangement of parts without departing from the spirit of my invention, and hence I do not desire to be limited to the exact construction and arrangement of parts shown and described.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In theatrical appliances, a wave maker comprising an operating arm or lever, a wave-plate hinged thereto, and means for imparting a to and fro or vibratory movement to the lever, substantially as described.

2. In theatrical appliances, a wave maker comprising a swinging pendulum lever, a wave-plate hinged thereto and means for imparting a vibratory movement to the lever, substantially as described.

3. In theatrical appliances, a wave maker comprising the swinging pendulum lever having the yoke arms rigid therewith, the angular extensions on said arms, the pins secured to said extensions, the wave-plate having one edge thereof hinged to said arms and adapted to be supported in either an upright or horizontal position by said arms and pins, and mechanism for actuating said lever, so as to impart a swinging or to and fro movement to the hinged wave-plate, substantially as described.

4. In combination with the wave maker, the water channel for controlling the direction of movement of the waves, substantially as described.

5. In combination with the wave maker the water channel consisting of the side plates having their upper edges extending a suitable distance in proximity to the wave maker nearly to the water line and thence extending the remaining length of the channel beneath the water line so as to avoid forming obstructions near the surface of the water, substantially as described.

6. In combination with the pendulum lever provided with the wave-plate and having the depending arms with friction rolls journaled thereto, the water channel having the side plates arranged at either side of said arms so as to contact with said rolls, substantially as described.

7. The combination with the swinging pendulum lever provided with the depending yoke-arms having the angular forward extensions with inwardly projecting pins thereon, of the wave-plate pivoted to said yoke-arms so as to bear thereon in an upright position on the forward movement of the lever, and to drop down onto said pins on the reverse movement, and means for vibrating the lever, substantially as described.

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

STEELE MACKAYE.

Witnesses:

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