June 16, 1936. W. B. HARRISON ET AL 2,044,686

TIDAL STORAGE DEVICE

Filed Oct. 2, 1934 2 Sheets-Sheet 1

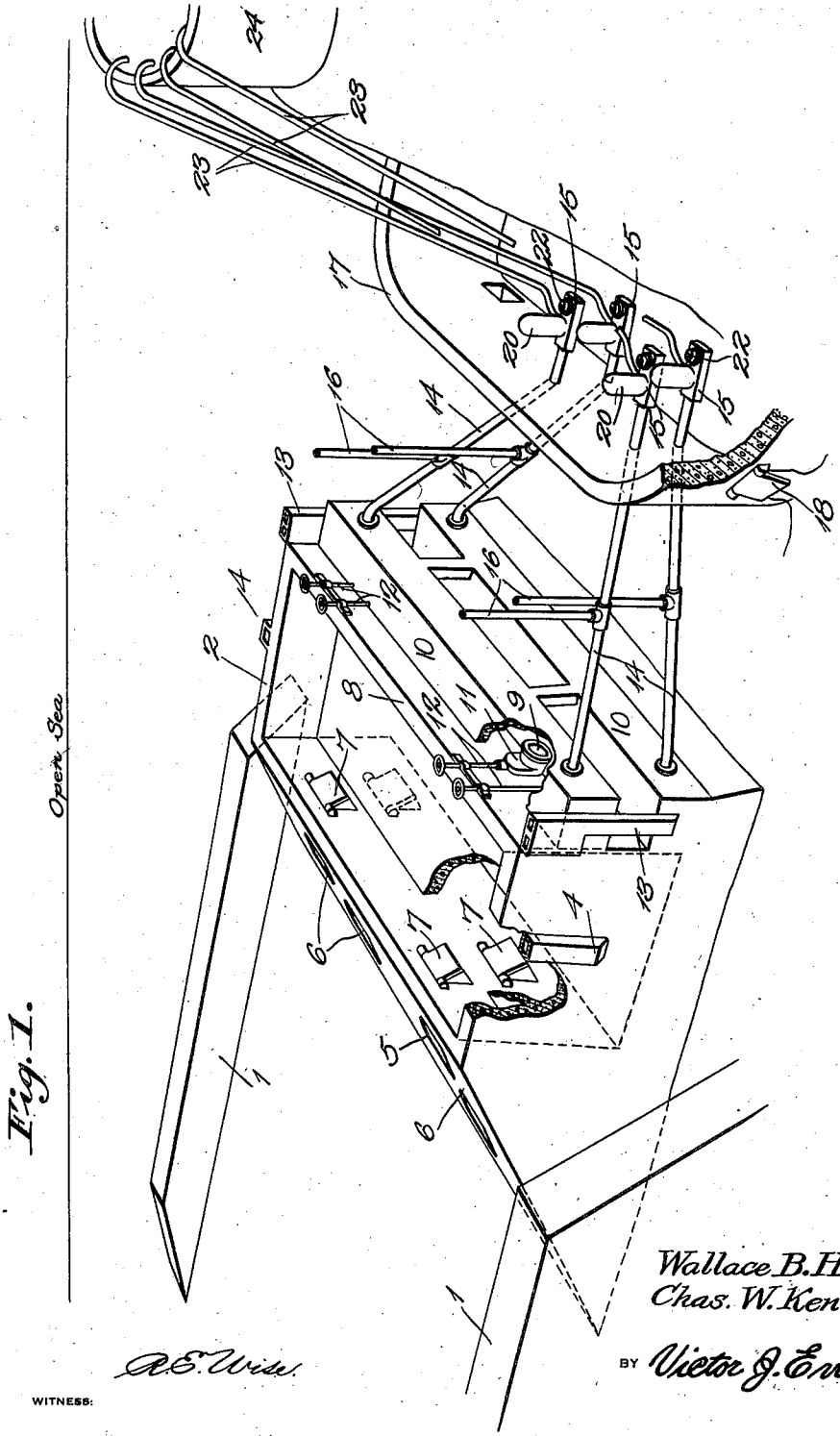


Fig. 1.

Wallace B. Harrison
Chas. W. Kennedy
INVENTORS

BY Victor J. Evans & Co.
ATTORNEYS

R. E. Wise
WITNESS:

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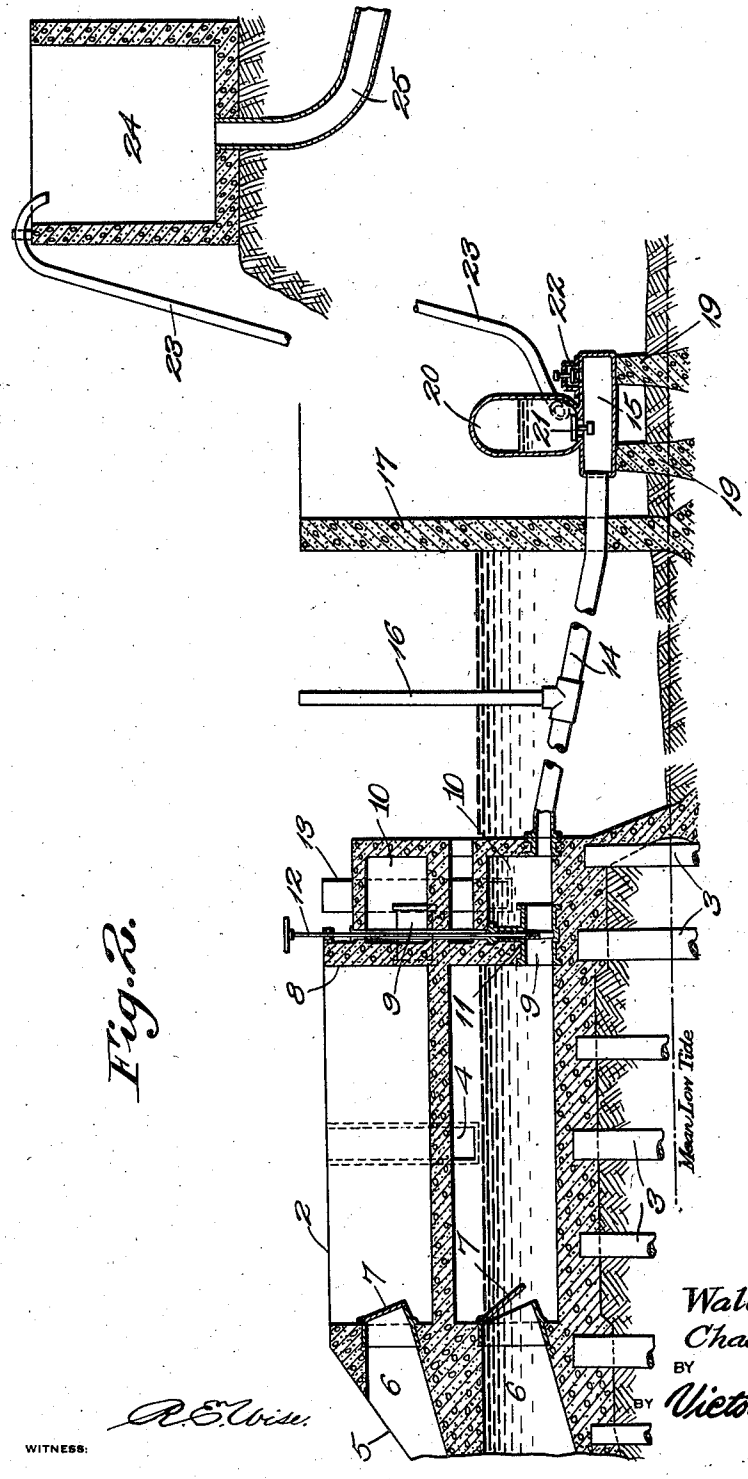


Fig. 2.

WITNESS: R. E. Wise.

Wallace B. Harrison
Chas. W. Kennedy
BY INVENTORS

BY Victor J. Evans & Co.
ATTORNEY

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UNITED STATES PATENT OFFICE

2,044,686

TIDAL STORAGE DEVICE

Wallace B. Harrison and Charles William Kennedy, Pasadena, Calif.

Application October 2, 1934, Serial No. 746,588

1 Claim. (Cl. 61—20)

The object of this invention is to provide an efficient apparatus whereby water, the power of waves and tides will be utilized to automatically store a body of water in an elevated reservoir to be subsequently used in driving turbines or other machinery. Such an apparatus is illustrated in the accompanying drawings and will be hereinafter fully described, and the invention resides in certain novel features which will be particularly defined in the appended claim.

In the drawings:

Figure 1 is a perspective view of an apparatus constructed and arranged according to the present invention.

Figure 2 is a vertical longitudinal section of the same.

In the practice of the invention, dikes 1 are built out into the ocean to such a distance as may be deemed desirable or feasible. Receiving reservoirs 2 are built at the inner ends of the dikes and the reservoirs, as well as the dikes, are preferably of cement which may have metallic reenforcements embodied therein. A foundation of piles for the reservoirs is indicated at 3, and it will be understood that the same type of foundation will generally be provided for the dikes. The reservoirs are shown as having two stories, the lower story being filled at low tide and the upper story receiving and storing the high tide waters, the top of the upper story being open so that, in the event of very high waves, the water may wash over into and be trapped in the upper reservoir. Air vent flues 4 rise from the ends of the reservoirs to prevent air being trapped therein or the formation of a vacuum, either of which developments would interfere with successful operation. The outer wall of the reservoirs, or the wall presented to the sea, is inclined downwardly and outwardly, so that the force of the waves and tide coming inward will be caused to be elevated into the reservoir. Inlet passages 6 are formed through the outer wall to direct the water into the reservoirs, and at the inner ends of the passages are inwardly-opening flap check valves 7 which will yield to the inflowing water but will close under a reverse flow and will be held normally closed by the pressure of water in the reservoir. In the rear or landward wall 8, pipes 9 are provided at the floor level of the respective reservoirs and upon said wall are formed auxiliary reservoirs or regulating chambers 10 into which said pipes open, as shown. In each pipe 9 is a gate valve 11, the stem or operating rod 12 of which extends to a point above the wall where it may be easily manipulated to open or close the valve and thereby regulate the flow to the rams or entirely cut off the flow when it is desired to stop the operation. Air vents 13 are provided at the ends of the regulating chambers and ram-feeding conduits 14 extend landward and downward from the regulating chambers to the rams 15, a breather pipe 16 being provided on each conduit and extending above the normal high tide level. The rams may be provided in any desired number and are located on the shore above the mean low tide level, a sea wall 17 being erected between the rams and the sea to prevent submersion of the rams, and the conduits extend through and are partly supported by the sea wall. A drainage gate 18 is provided in the sea wall for the escape of any water which may tend to collect behind the wall, and the rams are preferably mounted on piers 19 for stability and also to avoid possible surface water. The rams may be of any known or approved construction, having the usual air chamber 20, and valves 21 and 22. A delivery pipe 23 extends upward from each ram and discharges into an elevated storage reservoir 24 from which the water may escape through an outlet pipe 25 to drive an electric generator or other machinery, a suitable valve being provided in the outlet pipe at or near its delivery end in order that the flow may be controlled.

From the foregoing description, taken in connection with the accompanying drawings, it will be seen that we have provided an apparatus by which water from the sea will be automatically stored by its own force to be subsequently drawn by gravity, as needed to drive machinery. While the apparatus is efficient, it is durable and simple in construction.

Having described our invention, what we claim is:

A tidal storage device built into a sea or like body of water and comprising upper and lower reservoirs and a regulating chamber connected with each reservoir, the upper reservoir having an open top and the bottom wall thereof providing the top of the lower reservoir, said reservoirs having their sea facing wall provided with openings and a flap valve for each opening to trap sea water in the reservoirs, hand operated gate valves for controlling the passage of water between the reservoirs and the regulating chambers, air vents built in the device for delivering atmospheric air to the lower reservoir and to the chambers, and ram feeding conduits leading from the chambers.

WALLACE B. HARRISON.
CHARLES WILLIAM KENNEDY.