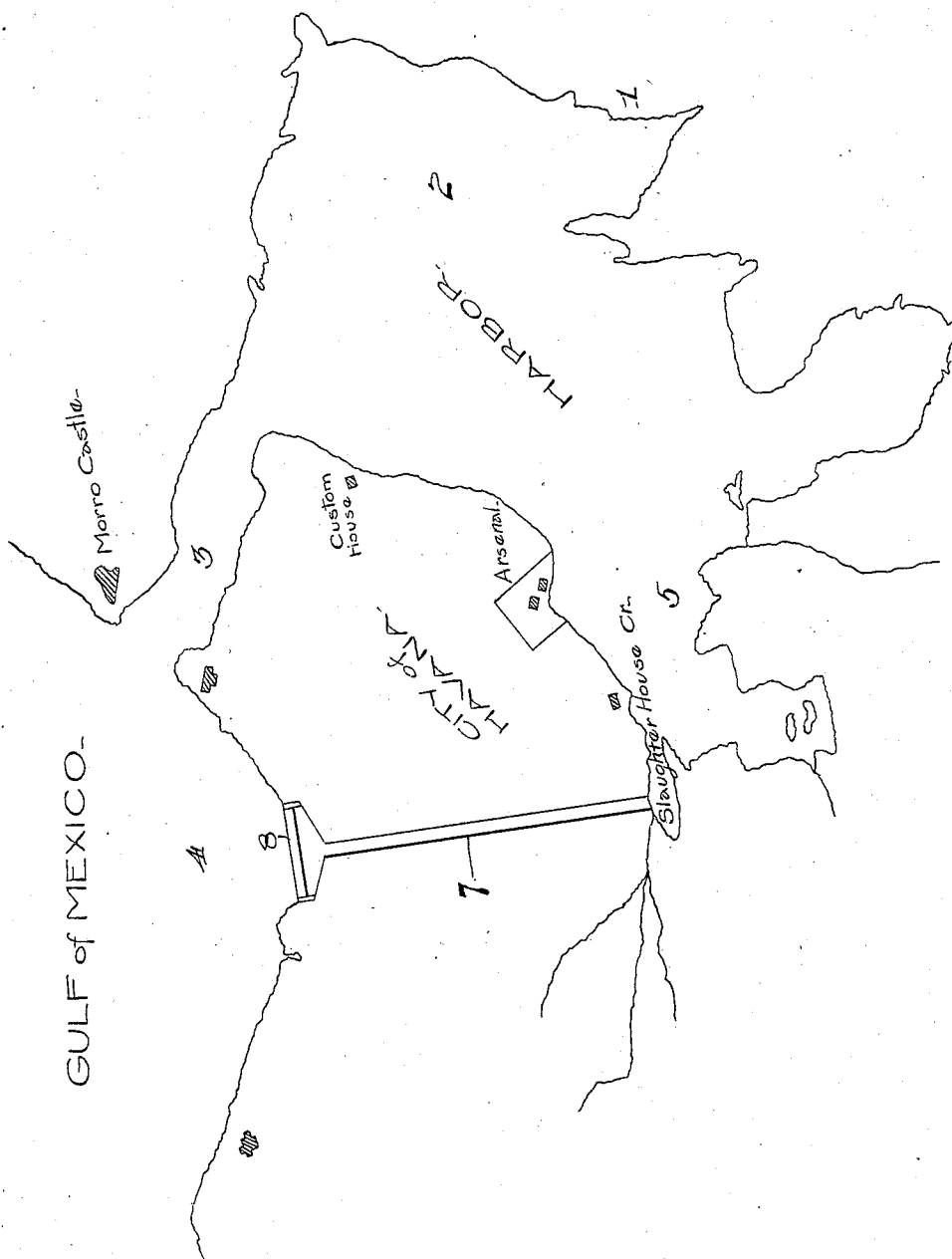


No. 833,543.

PATENTED OCT. 16, 1906.

J. W. PARKER.  
APPARATUS FOR CLEANSING HARBORS.  
APPLICATION FILED JULY 24, 1906.

3 SHEETS—SHEET 1.



Witnesses

*D. L. Mochelme*  
*M. H. Yates*

*Fig. I.*

Inventor:

*J. W. Parker*  
by *Joseph H. Atkins*  
Attorney.

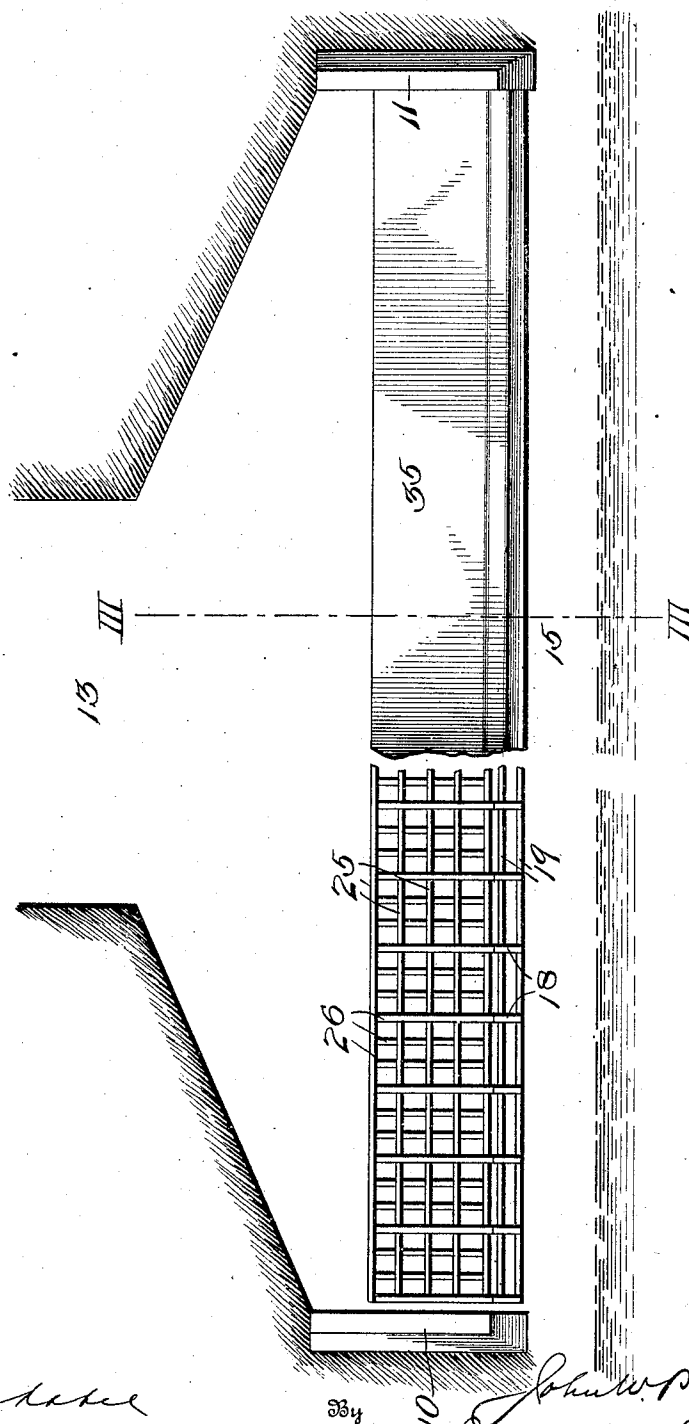
No. 833,543.

PATENTED OCT. 16, 1906.

J. W. PARKER.  
APPARATUS FOR CLEANSING HARBORS.  
APPLICATION FILED JULY 24, 1905.

3 SHEETS—SHEET 2.

Fig. II.



Witnesses  
D. H. Rochester  
M. H. Yates.

Inventor.

John W. Parker,  
James H. Atkins  
Attorney.

No. 833,543.

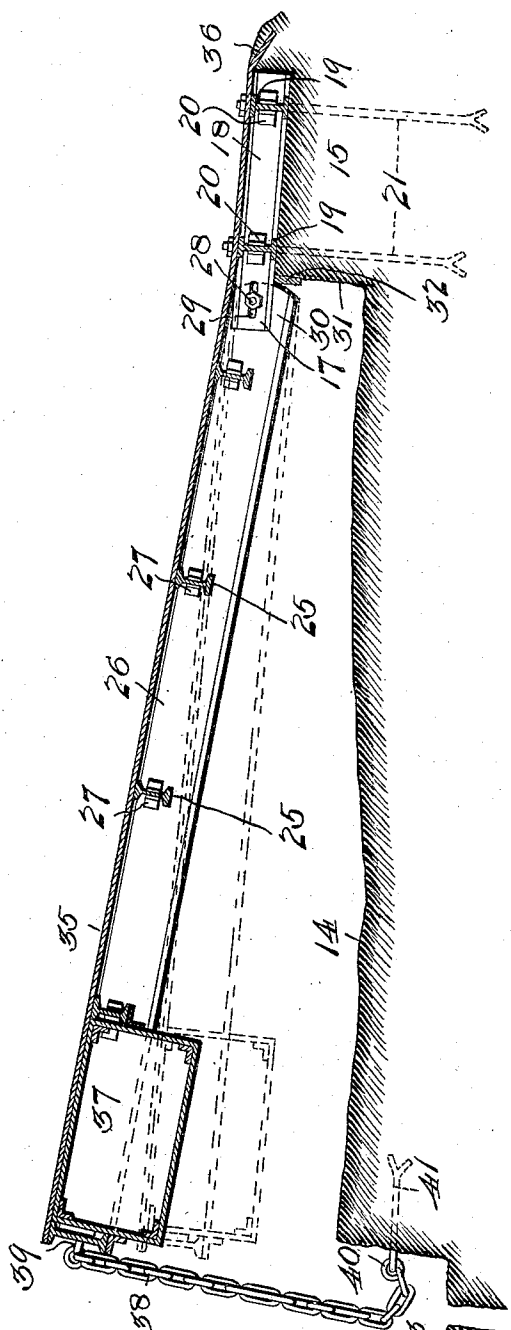
PATENTED OCT. 16, 1906.

J. W. PARKER.  
APPARATUS FOR CLEANSING HARBORS.

APPLICATION FILED JULY 24, 1905.

3 SHEETS—SHEET 3.

Fig. III.



Witnesses

*T. L. Mockman*  
*M. H. Yates*

Inventor:

*John W. Parker*  
*James H. Perkins*  
Attorney

# UNITED STATES PATENT OFFICE.

JOHN W. PARKER, OF MEXICO, MEXICO.

## APPARATUS FOR CLEANSING HARBORS.

No. 833,543.

Specification of Letters Patent.

Patented Oct. 16, 1906.

Application filed July 24, 1905. Serial No. 271,107.

*To all whom it may concern:*

Be it known that I, JOHN W. PARKER, a citizen of the United States of America, residing in Mexico city, in the Republic of Mexico, have invented certain new and useful Improvements in Apparatus for Cleansing Harbors, of which the following is a specification.

The object of my invention is to provide apparatus for the practice of the method of cleansing and keeping cleansed land-locked harbors opening to the sea, described in my companion application filed herewith. As set forth in the said companion application, I designate by the term "land-locked harbor" any bay or harbor which is either entirely devoid of rivers or streams from the landward side emptying into it or one in which the current or currents setting in from the sea so far preponderate in force or volume, or both, over those setting toward the sea as to produce stagnation in and fouling of the water of the harbor.

One ultimate purpose of my invention is by the cleansing of harbors to eradicate the seeds of diseases which have their origin in and are fostered by the accumulation of filth.

Another purpose is to provide for keeping a channel open in a harbor of the class specified against such obstruction, which under natural conditions accumulates in the form of sedimentary or sand deposits.

In order to accomplish the end in view, I provide opposite the open sea any suitable means which may be preferred adapted through utilization of the force of impact or dash of the waves to produce and preserve a constant head of water higher than the mean level of the sea and also means for compelling or permitting efflux of said head of water, as through a canal, entering the bay from its upper or landward end through the harbor exclusively. By this method uninterrupted discharge into the bay of clean salt-water in great volume may be effected. An accumulation of water in the bay is by such means obtained when the tide is coming in greatly in excess of that which flows into it through the natural entrance. Not only does the influx of the clean salt-water into the bay tend in itself to purify the harbor, but its discharge with the outflow of the ebb-tide, followed, as it is, by uninterrupted influx into the upper end of the bay, as above specified, effects the scouring of a channel through the harbor-bottom between the mouth of the canal afore-

said and the strait which defines the mouth of the harbor.

What constitutes my invention will be hereinafter specified in detail and succinctly set forth in the appended claims.

In the accompanying drawings, which constitute a part of this specification, Figure I is a plan representing, by way of example and without any attempt at geographical exactitude, the harbor of Havana, in the island of Cuba. Fig. II is a top plan view, partially in skeleton, of a floating apron, presented as a preferred construction of the wave-entrapping apparatus of the preferred form of head-producing mechanism adapted for the practice of my invention. Fig. III is a longitudinal vertical section as on the line III III of Fig. II.

Referring to the numerals on the drawings, 1 indicates the shore-line of a bay or harbor 2, whose entrance is the strait 3, opening into the sea 4.

5 indicates that part of the bay which in the foregoing specification I have designated the "upper" end of the harbor and between which and the strait 3 is confined, in a bay of the same general type as that illustrated, that accumulation of filth or sedimentary or sand deposit which it is the object of my invention to provide means of eliminating.

7 indicates a canal or waterway affording means of direct communication between the open sea 4 and the upper end 5 of the bay.

8, in Fig. I, indicates the head-producing mechanism, illustrated in detail in the remaining figures of the drawings and which is in practice located at the intake end of the canal at any point where it may be directly exposed to the action of the waves of the sea at all tides.

The head-producing mechanism may be of any known or preferred type, that illustrated being deemed to be simple, strong, and durable, and therefore preferred. The function required of it is that it shall receive the largest available volume of each wave that is presented to it above the mean level of the sea and having received the same that it shall prevent efflux thereof save through the waterway or canal provided for its discharge in the manner and for the purpose intended and specified. Through the employment of such a device whose use for other purposes than those set forth herein is well known in the art relating to wave powers it is practicable to produce and to preserve a constantly-

higher level of water within the canal 7 than the varying mean level of the sea without. The two levels change with the rise and fall of the tide; but at all tides there is a differential of levels or head which produces continuously a flow through the canal 7 and discharge therefrom into the end 5 of the bay 2. The force and volume of the current flowing through the canal 7 is determined by the head, whose height is in large measure dependent upon the force and frequency of the waves which break against and operate the mechanism of the head-producing apparatus. Since, however, it is the differential of levels that is relied upon to do the work intended and since there is always some motion of the sea toward the shore, even in its calmest state, my apparatus may be at all times depended upon for performance of the function required of it, proper provision being made to meet the exigency of storms or the like. The necessity for such provision is taken into account in the construction of the head-producing mechanism herein specified, the details of which are shown in Figs. II and III of the drawings, as aforesaid. Referring to those figures, 10 and 11 indicate massive abutments, preferably of concrete or reinforced concrete construction, which flank the intake end of the canal 7 and define between them the intake. 12, in Fig. III, indicates the side wall of the canal 7, which may be artificially supported or not as the conditions of the earth through which it is cut necessitate. 13 indicates the floor of the canal. 14 indicates the floor of the apron-case or excavation provided for the wave-entrapping mechanism, specifically herein denominated "the apron." On the seaward side is employed a ledge 15 of natural formation when such formation is available, but which may be made of or reinforced by artificial means if need be, as of concrete or reinforced concrete construction, extending between and beyond the abutments 10 and 11 defining the front of the apron-case. Its surface may be located approximately at, but not below, the low-tide level. One of its important functions in respect to the wave-entrapping mechanism is to afford secure and stable anchorage for the fixed members of the hinge connection of the apron. The said fixed members are preferably the inwardly-projecting ends 17 of cross-pieces 18, incorporated at suitable regular intervals in a unitary framing structure built of massive structural iron or steel channels, the stringers whereof are indicated by the reference-numerals 19, of which two, extending between the abutments 10 and 11, are illustrated in Figs. II and III of the drawings. The stringers, although, in effect, continuous between the abutments, may be in respect to detail of construction segregated into lengths corresponding to the distance be-

tween the respective cross-pieces 18, to which they may be riveted through the intervention of angle-plates 20 of familiar use in such construction. (See Fig. III of the drawings.) The framing structure, built as above specified or in any other suitable manner preferred, is immovably fixed to the top of the ledge 15, as by anchor-bolts 21, disposed at frequent and proper intervals throughout the framing structure and deeply embedded and secured in the body of the ledge, as shown, for example, in Fig. II of the drawings.

The apron is a suitable structure provided near its inner or free side with buoy and means of support and hinged at the opposite side to the framing structure above described or its equivalent. I prefer to build the apron of sections of channel iron or steel substantially in the same manner as the framing structure specified is built, the apron-stringers being indicated by the reference-numeral 25, the apron cross-pieces by 26, and the apron angle-plates, through whose intervention the members 25 and 26 may be united, by the numerals 27. The apron cross-pieces 26 being disposed at proper intervals to correspond with the disposition of the cross-pieces 18 play against the cross-pieces 18, respectively, and are hinged thereto, as by bolts or suitable hinge connection 28. The bolt or bolts 28 passes or pass through horizontally-elongated apertures, one being indicated by the numeral 29 in Fig. III of the drawings, in order to afford a loose joint for the rise and fall of the apron, whose cross-piece ends 30 preferably abut against the face 31 of the ledge 15. The face 31 may be provided with a suitable bearing plate or plates 32 to receive the end thrust of the apron cross-pieces 26.

The entire surface of the framing structure and the apron when hinged thereto is covered with a suitable skin 35, extending, in effect, over the entire surface of the said two structures. It should be durable, flexible, and sufficiently strong and water-tight to prevent any considerable efflux of water from the canal after having been entrapped therein. I prefer to make the skin of copper, which will last well in salt-water and is sufficiently pliable to accommodate for a long time without breaking the rise and fall of the apron upon its hinge connection to the framing structure. The copper skin, which, although, in effect, continuous, may be of course made up of plate-sections riveted or otherwise properly assembled, is suitably secured, as by rivets, to the respective structures which it covers and preferably has its seaward edge 36 (see Fig. III) depressed and well embedded in the land to protect it from being undermined or ripped off by the action of the waves.

The buoyant means of support provided for the apron is indicated by reference-

numeral 37, designating an air-tank, or it may be a plurality of air-tanks, secured to the inner side of the apron near its free end and of required calculated dimensions to float the apron.

The means provided to protect the apron from injury during a storm, for instance, or whenever the violence of frequency of the waves might possibly upset it or strain its skin at or above its hinge connection may be a chain 38, fastened at one end, as indicated at 39, to the apron and at the other, as indicated at 40, an anchor-bolt 41, properly embedded in the canal-wall. The length of such a chain may determine the limit of the rise of the apron. A number of chains distributed along the length of the apron would in practice be employed.

The operation of my apparatus may be briefly described as follows: Suppose, for the purposes of this explanation, the apparatus, substantially as specified, to be duly installed and in working order, the top of the apron to be on a level with the top of the framing structure and exposed to the action of the waves. The top of the ledge 15 being postulated as located at or above low-tide level, the water-level in the canal 7 may be assumed to correspond with the sea-level and the free end of the apron to be afloat with the bottom of the tank 37, safely lifted above striking distance of the floor 14 of the apron-case. Thereupon and thereafter a portion of the volume of each wave that dashes against the apron drives over it into the canal and is therein entrapped by the apron. The accumulation of the entrapped water of the succession of waves produces and preserves the head required for the performance of the specified function required of it and forthwith commences and continues to perform its cleansing office, substantially in the manner hereinbefore set forth. With the rise and the fall of the tide the head is preserved as a relatively constant quantity by reason of the always present differential of levels in the canal and in the sea or bay, respectively.

It may be observed that no dimensions are set forth in the foregoing specification. They are omitted, not only because they are in no wise essential to the explication of the principle of the invention, but also because they should be calculated in every instance of proposed use to meet the local conditions presented.

What I claim is—

1. The combination with a shore-line defining a harbor and a sea-front, of always open means of communication between the sea-waves and the harbor, and wave-entrapping mechanism located in said means of communication.

2. The combination with a shore-line defining a harbor and a sea-front, of means of communication between the sea-front and

the harbor, and wave-entrapping mechanism operative by wave impact and located in the intake of said means of communication.

3. The combination with a shore-line defining a harbor and a sea-front, and a canal establishing communication between the sea-front and the harbor, and provided with an intake at its seaward end, of wave-entrapping mechanism in said intake.

4. In apparatus for the purpose specified, the combination with the intake end of a canal, of an apron-case therein, and a floating apron operatively mounted therein.

5. In apparatus for the purpose specified, the combination with abutments and a ledge defining the intake end of a canal and apron-case therein, of a floating apron hinged to said ledge.

6. In apparatus for the purpose specified, the combination with abutments and a ledge defining the intake end of a canal and apron-case therein, of a floating apron hinged to said ledge, said apron being provided with a skin.

7. In apparatus for the purpose specified, the combination with abutments and a ledge defining the intake end of a canal, and apron-case therein, of a floating apron hinged to said ledge, said apron and ledge being covered with a skin.

8. In apparatus for the purpose specified, the combination with abutments and a ledge defining the intake end of a canal, and apron-case therein, of a floating apron hinged to said ledge, said apron and ledge being covered with a flexible skin in effect continuous.

9. In apparatus for the purpose specified, the combination with the intake end of a canal having an apron-case provided with a front defining ledge, of a framing structure anchored to the ledge, and a floating apron hinged to the framing structure.

10. In apparatus for the purpose specified, the combination with the intake end of a canal having an apron-case provided with a front defining ledge, of a framing structure anchored to the ledge and provided with cross-pieces constituting fixed hinge members, and a floating apron hinged to said cross-pieces.

11. In apparatus for the purpose specified, the combination with the intake end of a canal having an apron-case provided with a front defining ledge, of a framing structure anchored to the ledge and provided with cross-pieces constituting fixed hinge members, and a floating apron having corresponding cross-pieces hinged to the first-named cross-pieces.

12. In apparatus for the purpose specified, the combination with the intake end of a canal having an apron-case provided with a front defining ledge, of a framing structure anchored to the ledge and provided with cross-pieces constituting fixed hinge mem-

bers, and a floating apron having corresponding cross-pieces hinged to the first-named cross-pieces by a loose connection, and means upon the wall of said ledge for resisting the end thrust of the apron cross-pieces.

13. In apparatus for the purpose specified, the combination with the intake end of a canal provided with wave-entrapping mechanism including a floating apron as set forth, of a skin covering said apron and having its outer edge embedded in the earth.

14. In apparatus for the purpose specified,

the combination with the intake end of a canal provided with wave-entrapping mechanism including a floating apron as set forth, of means for limiting the rise of the free end of said apron.

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

JOHN W. PARKER.

Witnesses:

CURT BECK,

GRAHAM M. KER.