No. 824,141. PATENTED JUNE 26, 1906.

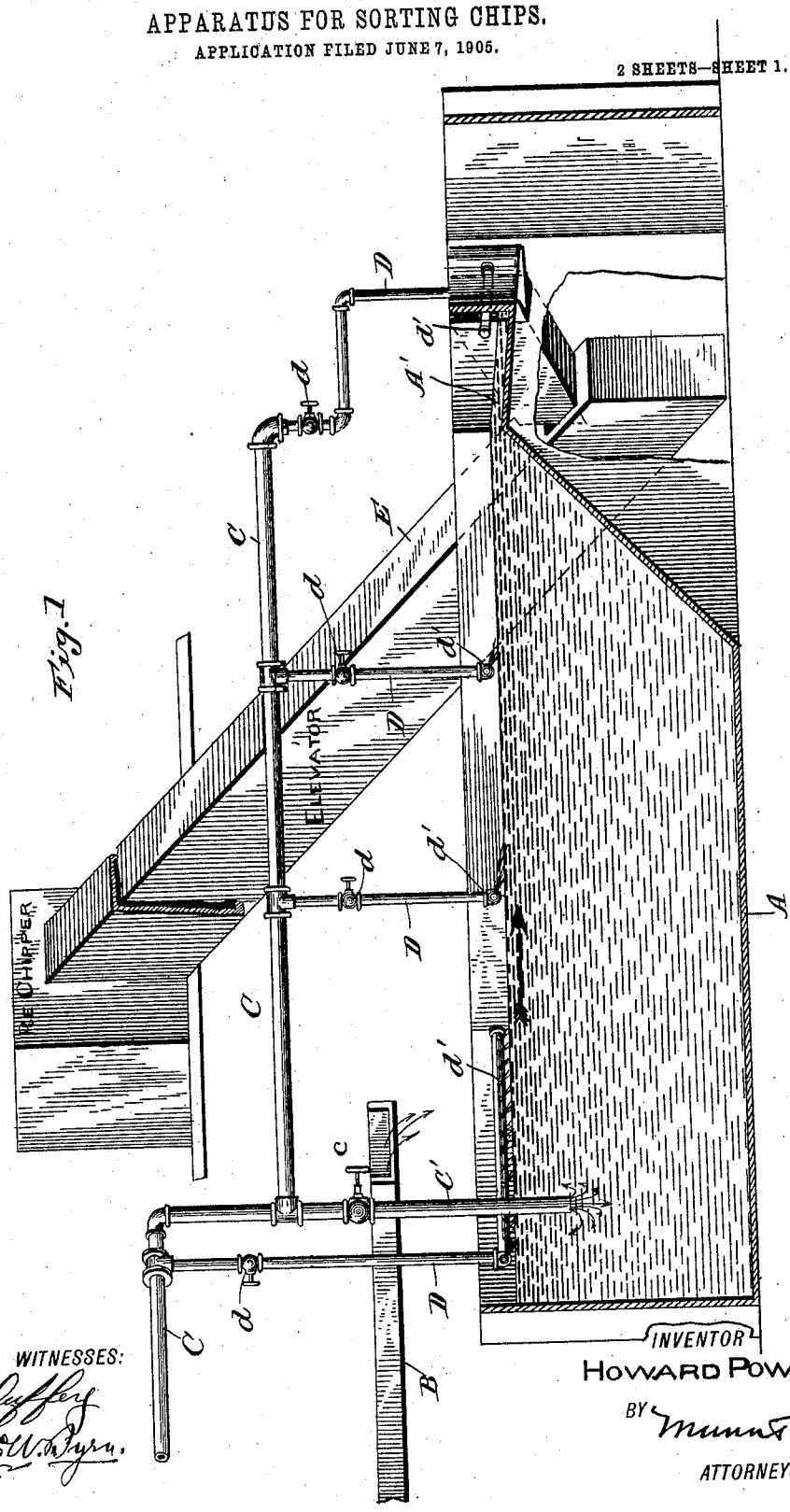
H. POWERS.

APPARATUS FOR SORTING CHIPS.

APPLICATION FILED JUNE 7, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

C. C. Hoffsey

Edw. W. Byrn.

INVENTOR

HOWARD POWERS

BY Munn & Co.

ATTORNEYS

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

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2 SHEETS—SHEET 2.

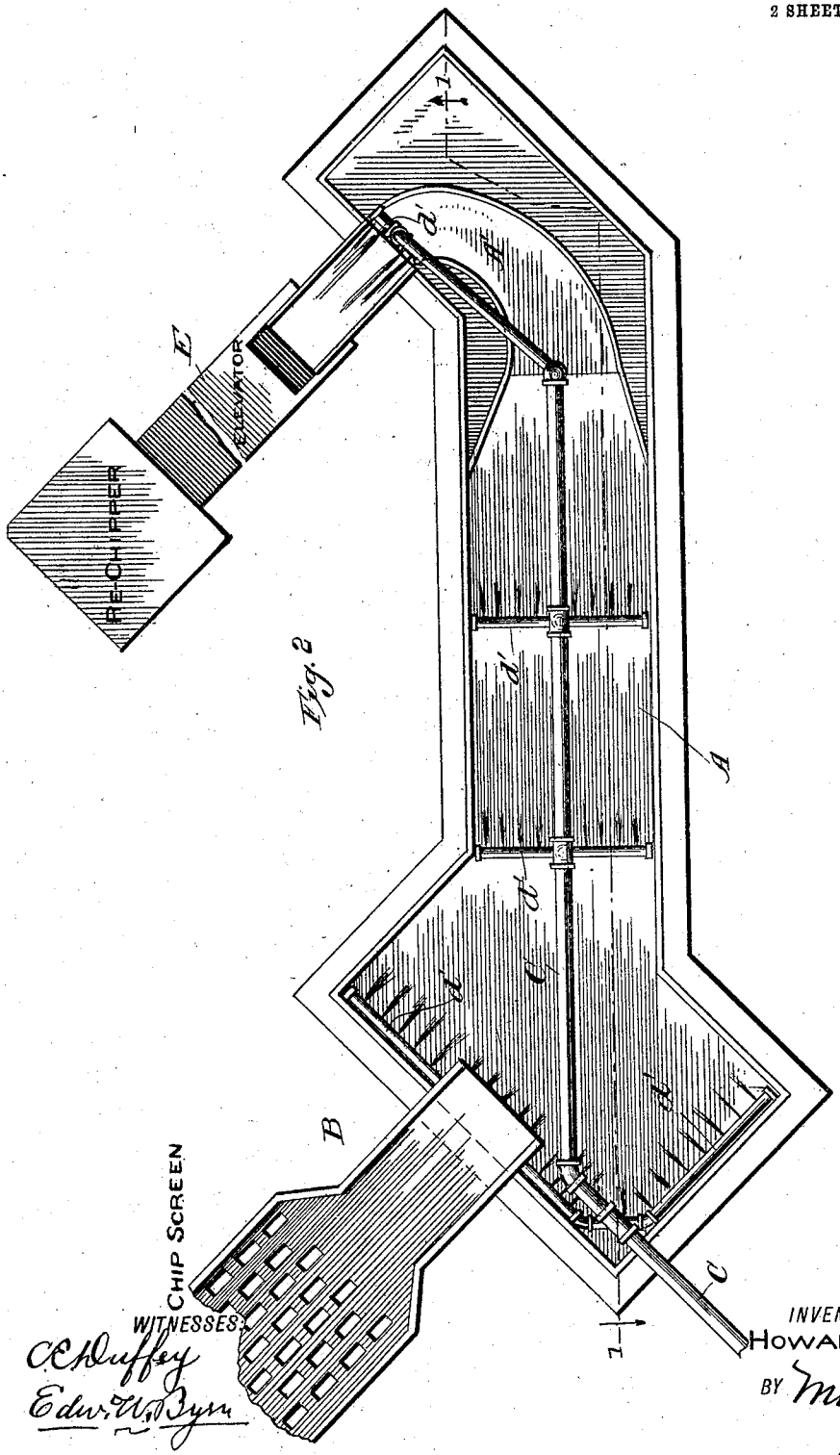


Fig. 2

WITNESSES:

C. C. Duffey

Edw. W. Byrn

INVENTOR

HOWARD POWERS

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

HOWARD POWERS, OF LINCOLN, NEW HAMPSHIRE, ASSIGNOR OF FOUR-FIFTHS TO JOLBERT CONSTRUCTION COMPANY, OF BERLIN, NEW HAMPSHIRE, A CORPORATION OF NEW HAMPSHIRE.

APPARATUS FOR SORTING CHIPS.

No. 824,141. Specification of Letters Patent. Patented June 26, 1906.

Application filed June 7, 1905. Serial No. 264,108.

To all whom it may concern:

Be it known that I, HOWARD POWERS, a citizen of the United States, and a resident of Lincoln, in the county of Grafton and State of New Hampshire, have made certain new and useful Improvements in Apparatus for Sorting Chips, of which the following is a specification.

In the practical preparation of wood for making sulfite paper-pulp the wood is cut into chips and quite a large proportion of the chips get through the machine in such large sizes that they require to be subdivided or re-chipped before being suitable to put into the digester to cook. All the knots which happen to be in the wood are also intermingled with the chips. It is common to screen the chips to separate the knots and large pieces from the chips of proper size; but the separation of the large pieces from the knots is not so easily effected.

My invention consists in an apparatus for separating the large chips from the knots, which consists in a tank or receptacle filled with water, into which the screened out knots and large chips are discharged and in which the knots by their greater specific gravity sink, while the lighter chips float, in combination with a series of perforated pipes arranged close to the water-level, the issue-orifices all being faced in one direction, whereby the floating chips are continuously carried away by a surface current produced by a series of impinging jets of water or air and under the influence of which the floating chips are carried off over a spillway and delivered to an elevator to be carried up to the re-chipper, all as hereinafter more fully described with reference to the drawings, in which—

Figure 1 is a side elevation, partly in section, of my new apparatus; and Fig. 2 is a plan view of the same.

A is a tank, canal, or other receptacle which is to be filled with water and which at one end is made of considerable depth and at the other end has at its upper level a shallow spillway A′, which inclines downwardly and outwardly and over which a shallow sheet of water is constantly flowing.

B is the discharge-chute from the screen, which separates the little chips from the larger ones and the knots and which chute delivers the knots and large chips into the deep end of the tank. This receiving end of the tank is preferably enlarged in horizontal direction, as seen in Fig. 2.

C is a water-supply pipe through which a current of water is constantly flowing into the tank. A branch C′, controlled by a valve *c*, is used to fill the tank with water to the spillway-level and to supply the spillway. From the main supply-pipe C a series of branch pipes D D descend to near the level of the water in the tank, and at the lower ends these branch pipes bear horizontal cross-pipes *d*′, that lie close to the water-level and have on one side a series of apertures through which the water issues in a series of forceful jets always in the same direction, and this toward the spillway A′. These jet-pipes are placed close enough together to maintain a surface current toward the spillway, which feeds the floating chips over the spillway and into the elevator E, which takes them to the rechipper. The last of the jet-pipes is located to play upon the inclined spillway to keep the chips from clogging on the same.

The branch pipes D are each controlled as to flow of water by valves *d*, and there may be any desired number of jet-pipes.

As the knots and larger chips fall into the tank the knots sink by virtue of their greater specific gravity and remain at the bottom of the deepest portion of the tank and are removed from time to time to be utilized for fuel or other purpose. The knots are thus retained in a sort of hydraulic trap, while the chips are progressively carried over the spillway.

After the tank is filled with water the inflow through the pipe C′ may be discontinued and the flow through the jet-pipes alone may be sufficient for the flotation of the chips over the spillway; but for the more rapid clearance of the chips from the spillway an inflow through the pipe C′ is constantly maintained to give a sufficient depth of water on the spillway to float the chips off without clogging. The progress of the large chips after they strike the water is so rapid that they do not become sufficiently wet to require drying before they are ready to go to the digester, and this is a great advantage, as it saves delay in the process of manufacture.

In carrying out my invention it is not nec-

essary that the surface movement of the chips should be effected by the jets of water, for if the inflow of water through the pipe C' be maintained in sufficient quantity to float the chips over the spillway the progressive movement of the chips along the tank-surface to the spillway may be effected by a blast or streams of air issuing through the jet-pipes or by suitably-placed nozzles.

I do not confine myself to any particular shape of tank, as this may be changed to suit circumstances.

It will be observed that the jet-pipes are located above the level of the spillway and slightly above the level of the water. This involves the following distinctive results: first, that these pipes afford no obstruction to the progressive surface movement of the floating chips, but allow them to move rapidly under the jet-pipes and be discharged over the spillway before the chips have had time to absorb much water, and, secondly, this location of the pipes gives only a surface movement and does not agitate the lower strata of water, but leaves the lower strata of water quiet and well adapted to the settlement or subsidence of the heavier knots and their separation from the floating chips.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for separating chips, comprising a receptacle for a body of water, and a series of jet-pipes arranged near the water-level but above the level of the same and having their orifices all faced in one direction for progressively feeding the chips along the surface of the water.

2. An apparatus for separating chips, comprising a receptacle for a moving body of water, made deep at one end to retain the heavy sinkable pieces and having a shallow spillway at the other end, and jet-pipes arranged above the level of the spillway and having their orifices all faced in one direction for producing a current along the surface.

3. An apparatus for separating chips, comprising a tank, a spillway at the upper level of the tank, a water-supply pipe having a plurality of branches with valves, one of said branches serving to supply the tank for maintaining the spillway, and the other branches having jet-pipes arranged above the level of the spillway and having their orifices all faced in one direction to maintain a surface current toward the spillway.

4. An apparatus for separating chips, comprising a tank, a spillway at the upper level of the tank inclining downwardly and outwardly, a water-supply pipe having jet-pipes located above the level of the spillway for maintaining a surface current toward the spillway, and one or more jet-pipes located on the spillway to keep it from clogging.

HOWARD POWERS.

Witnesses:
WM. E. JOLBERT,
MERRILL SHURTLEFF.