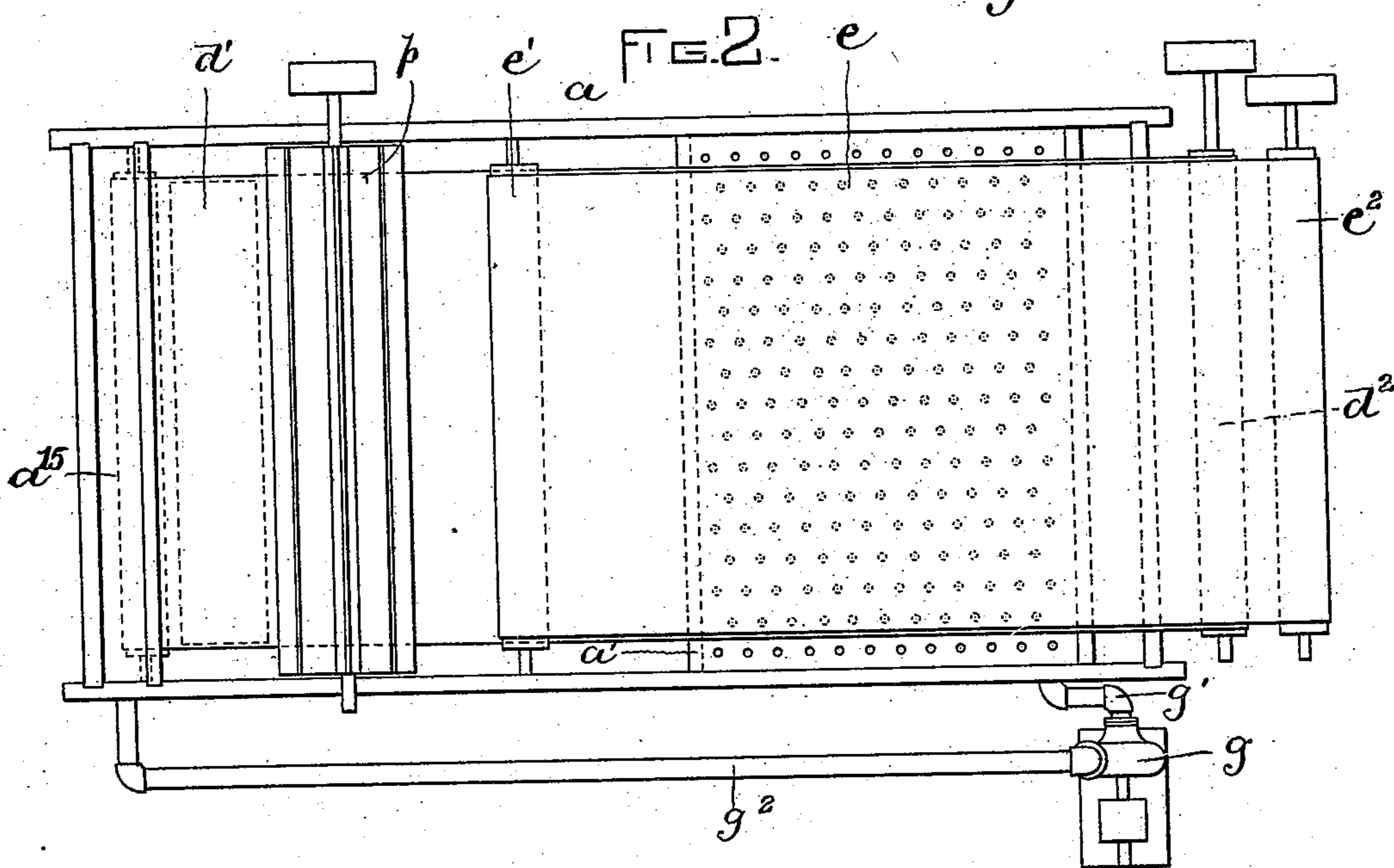
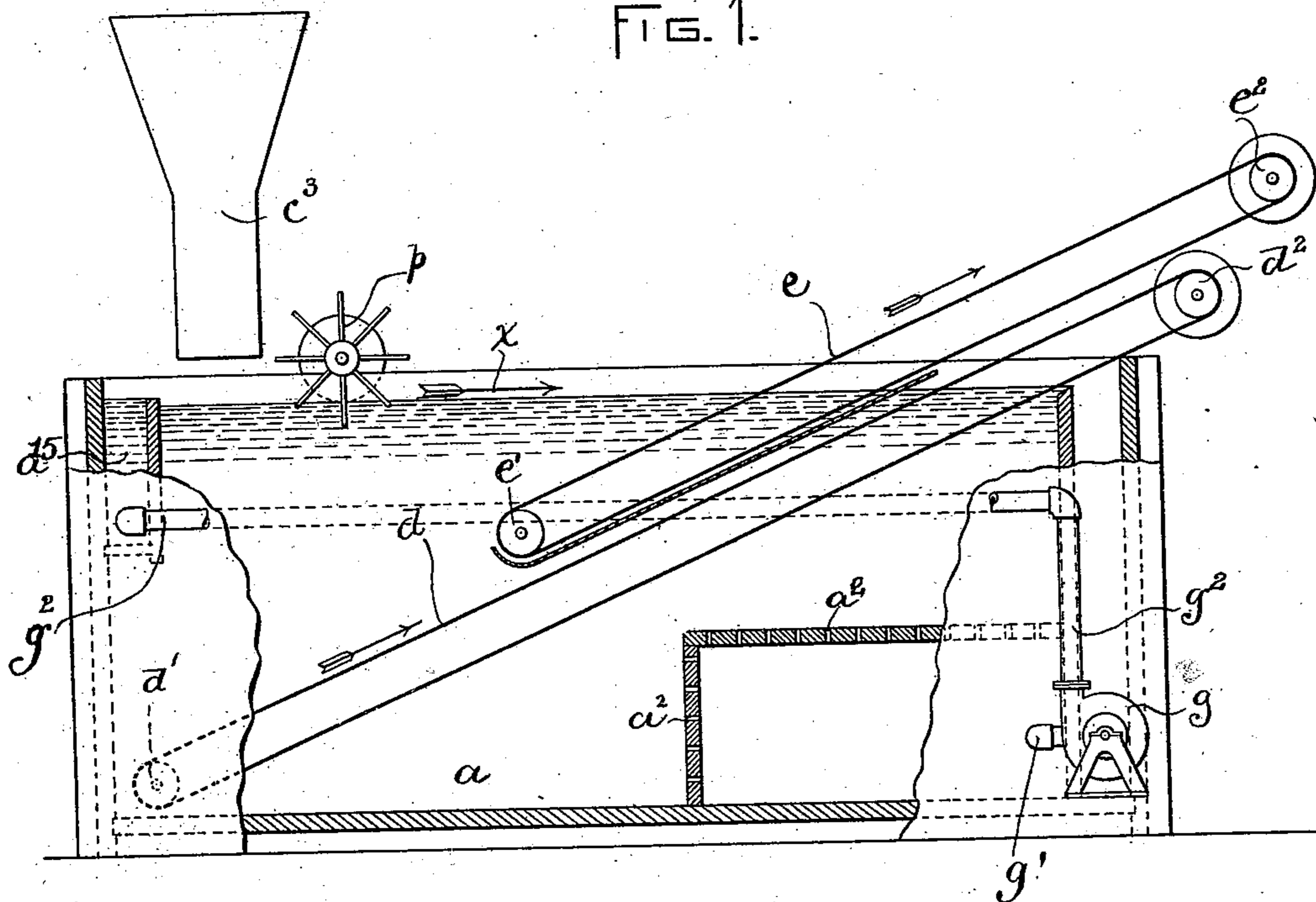


(No Model.)

R. S. TALBOT.

METHOD OF AND APPARATUS FOR ASSORTING WOOD PULP CHIPS.  
No. 556,111. Patented Mar. 10, 1896.

FIG. 1.



WITNESSES:

A. D. Harrison  
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INVENTOR:

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by Wright Brown & Quincy  
Attys.

# UNITED STATES PATENT OFFICE.

REGINALD S. TALBOT, OF LINCOLN, MAINE, ASSIGNOR TO THE NEW ENGLAND SULPHITE DIGESTER COMPANY, OF BOSTON, MASSACHUSETTS.

## METHOD OF AND APPARATUS FOR ASSORTING WOOD-PULP CHIPS.

SPECIFICATION forming part of Letters Patent No. 556,111, dated March 10, 1896.

Application filed June 3, 1895. Serial No. 551,499. (No model.)

*To all whom it may concern:*

Be it known that I, REGINALD S. TALBOT, of Lincoln, in the county of Penobscot and State of Maine, have invented certain new and useful Improvements in Apparatus for Assorting Wood-Pulp Chips, of which the following is a specification.

This invention relates to the preparation of chips used in the manufacture of wood pulp, and it has for its object to enable such chips to be effectively and economically assorted by separating the chips made wholly or principally from the knots and knotty portions of the wood from the chips made from the clear portions.

The knotty portions of spruce and other woods used in the manufacture of pulp are very dense and tough and contain so much resinous matter that they cannot be satisfactorily cooked or reduced to pulp. Moreover, they are dark in color and contrast strongly with the color of the clear-wood pulp. For these reasons the presence of knot-wood in a charge of chips is a serious disadvantage. Attempts have been made to eliminate the knot-wood by cutting or boring out the knots prior to the reduction of the log to chips and by picking out the knot-wood chips by hand while the chips are spread out and being carried by a conveyer. All the methods heretofore used are expensive and unsatisfactory and fail to perfectly accomplish the end desired.

My invention is based upon the discovery that when a mass of chips is deposited upon the surface of a body of liquid and broken up or scattered, and at the same time forcibly submerged, so that the chips will be separated or freed from each other below the surface of the liquid, the knot-wood chips becoming partially saturated by the liquid will sink, their specific gravity being greater than that of the liquid, particularly after their surfaces have been exposed to contact therewith. The clear-wood chips, on the other hand, are not affected by this surface saturation and therefore rise to the surface of the liquid owing to the difference between their specific gravity and that of the liquid.

My invention therefore consists in a chip-assorting apparatus comprising a tank, a body

of liquid therein, a striker or agitator subdividing the surface of the liquid into a chip-receiving area and a chip-delivering area, said agitator being constructed and arranged so that when in operation it forcibly submerges and scatters the chips which are supplied to the receiving-area, and separating the chips from each other, causing their surface saturation and therefore the settling or sinking of the knot-wood chips and the rising of the clear-wood chips, the latter entering the delivering-area of the body of liquid from which they are removed by a conveyer entering said delivering-area, said conveyer being included as a part of my improved apparatus.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a partial side elevation and partial vertical section of an apparatus embodying my improvement. Fig. 2 represents a top plan view of the same.

The same letters of reference indicate the same parts in both the figures.

In the drawings, *a* represents a tank containing a body of liquid.

*p* represents an agitator or striker, which, as here shown, consists of a horizontal shaft extending across the top of the tank and provided with a series of radial blades rigidly affixed to the shaft, means being provided for rotating the shaft, the blades of which are formed to enter the body of water and positively press down and submerge any floating chips with which they may come in contact while moving downwardly. The agitator or striker *p* extends across the tank, as shown in Fig. 5, and is located between the ends thereof, so that it subdivides the surface of the body of liquid into a receiving-area, which is located below a supply spout or chute *c*<sup>3</sup>, and a delivering-area into which extends a conveyer *e*, hereinafter referred to.

While my invention is not limited to the particular form of agitator or striker here shown, it is important that said striker possess the following characteristics, namely: First, it must be constructed so that it will strike and forcibly scatter chips floating upon the receiving-area, effectually separating said chips from each other and submerging them in the body of liquid; second, it must ob-

struct only a comparatively narrow line or section of the surface of the liquid, so that the clear-wood chips can rise quickly to the delivering-area of the body of liquid without being held below the surface of the liquid long enough to become soaked to such an extent as to cause them to sink, a result which might take place if they were submerged for any considerable length of time. These results are secured by the construction here shown, the rotary agitator, composed of the shaft and the radial arms or beaters rigidly affixed thereto, obstructing but a small portion of the surface of the liquid and being separated from the conveyer *e* by an area of considerable extent.

The conveyer *e* is here shown as an endless band, mounted upon rolls *e'* *e''*, the former being below the surface of the liquid, while the latter is above said surface. The conveyer is inclined and is driven in the direction indicated by the arrow in Fig. 1 by power applied to one of the rolls.

The rotation of the agitator *p* not only scatters and submerges the chips, as above stated, but also moves the liquid at and near the surface in the direction indicated by the arrow *x* in Fig. 1, the liquid being thus caused to convey the clear-wood chips to the conveyer *e*.

*d* represents a second conveyer, located below the conveyer *e* and supported by rolls *d'* *d''*, the lower end of the conveyer *d* extending into the tank farther than the lower end of the conveyer *e*, so that the conveyer *d* is arranged under the chip-receiving area of the body of liquid and receives the heavier chips and other matters that fall in the body of liquid. The matter deposited upon the conveyer *d* is elevated by the latter and discharged from the tank, the said conveyer being impelled in the direction indicated by the arrow marked thereon in Fig. 1.

*g* represents a pump, which is connected by a suction-pipe *g'* with a compartment in the lower portion of the tank, said compartment being composed of perforated pieces *a'* *a''*. The pump is connected by a delivery-pipe *g''* with a forebay *g'''* at the upper portion of the tank, the arrangement being such that the operation of the pump causes a circulation of water in the tank, whereby the liquid is caused to move the floating chips toward the conveyer *e*. The pump is used when it is desirable to economize the use of water, but when such economy is not an object the pump may be dispensed with and a stream of water may be allowed to enter at one end of the tank and escape at the other end.

The operation is as follows: The chips are supplied to the receiving-area of the body of liquid through the spout *c'* and are attacked by the agitator or striker and separated from

each other and forcibly submerged, the chips being thus superficially saturated, so that the sinking of the knot-wood chips is insured, the clear-wood chips rising into the delivering-area of the body of liquid and being conveyed by the movement of the liquid to the conveyer *e*, by which they are removed from the tank.

It will be seen that my invention provides for the economical and efficient separation from the clear-wood chips of not only knot-wood, but also pieces of bark and what is known as "sap-rotten wood," these parts when saturated with water being of greater specific gravity than water, so that they readily sink.

The thorough removal of knot-wood, bark, and sap-rotten wood from wood-pulp chips is a very great advantage in the art of manufacturing wood pulp, since it prevents the discoloration and contamination of the pulp by elements which are in every respect objectionable. The ordinary knot-wood is objectionable, because when reduced it leaves dark-colored sheaves and strings in the pulp, while the bark and rotten wood when reduced are disintegrated into a fine powder and discolor the portions of the pulp into which they are incorporated.

It is obvious that my invention may be practiced by the use of any suitable liquid for separating the different grades of chips, the use of pure water not being essential—that is to say, I may use a bisulphite solution, such as that employed in cooking the pulp, or any other suitable liquid which will permit the ready separation of the different grades of chips from each other.

The knot-wood chips constitute a by-product which may be utilized as fuel, the said chips being rich in resinous matter.

I claim—

A chip-assorting apparatus comprising a tank, a body of liquid therein, a rotary agitator or striker subdividing the surface of the liquid into a chip-receiving and a chip-delivering area, said agitator forcibly submerging chips floating on the receiving-area and permitting the submerged chips to rise into the delivering-area, and a conveyer arranged to remove floating chips from said delivering-area, the agitator and conveyer being separated by a space sufficient to permit the lighter chips to rise without interfering with the settling of the heavier chips.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 25th day of May, A. D. 1895.

REGINALD S. TALBOT.

Witnesses:

FRANK R. LINTON,  
GEORGE F. ROWE.