

(No Model.)

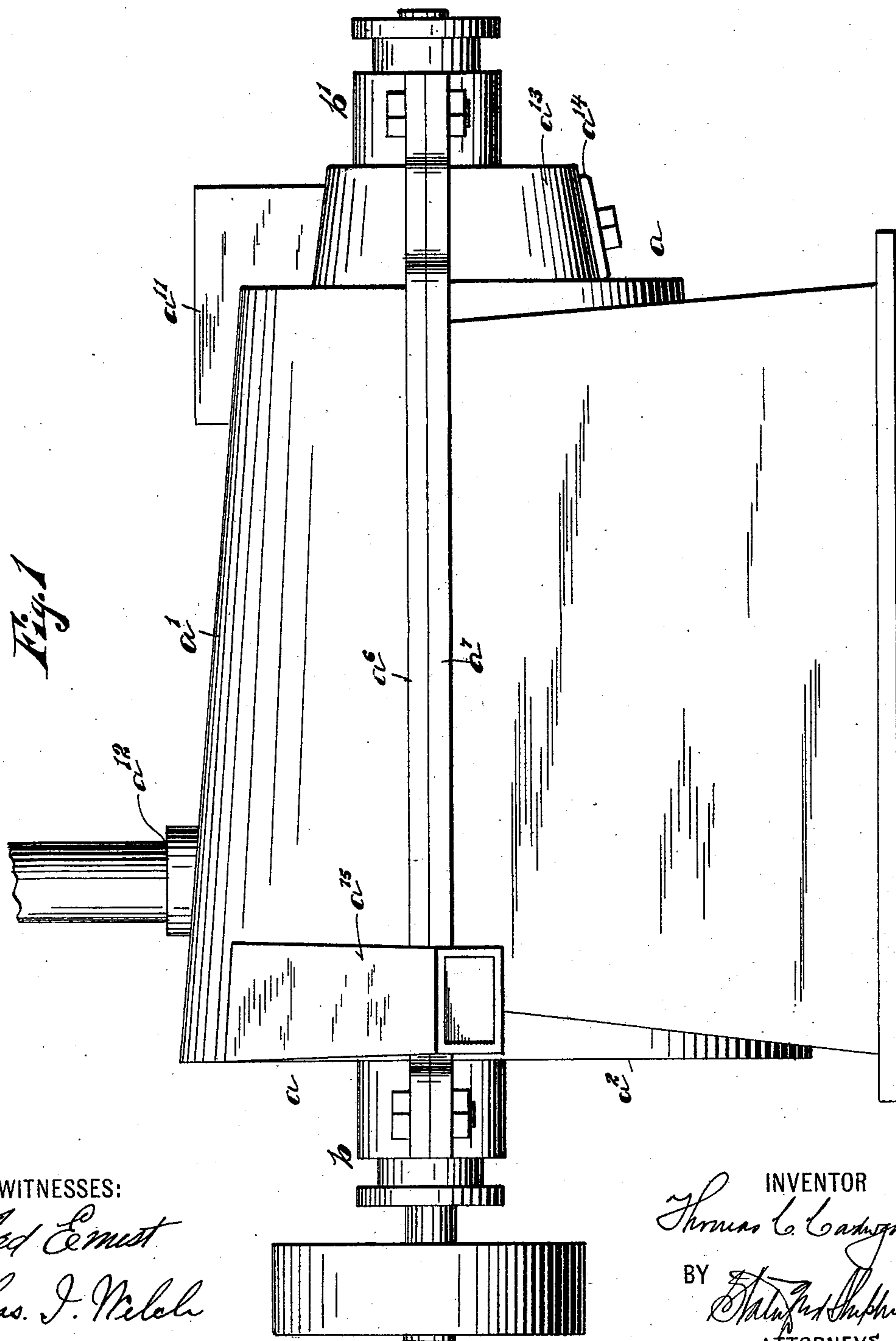
3 Sheets—Sheet 1.

T. C. CADWGAN.

MACHINE FOR WASHING AND PREPARING PAPER STOCK.

No. 539,412.

Patented May 21, 1895.



WITNESSES:

Wm. Ernest
Chas. J. Nichols

INVENTOR

Thomas C. Cadogan
BY *John F. Shepherd*
ATTORNEYS

(No Model.)

3 Sheets—Sheet 2.

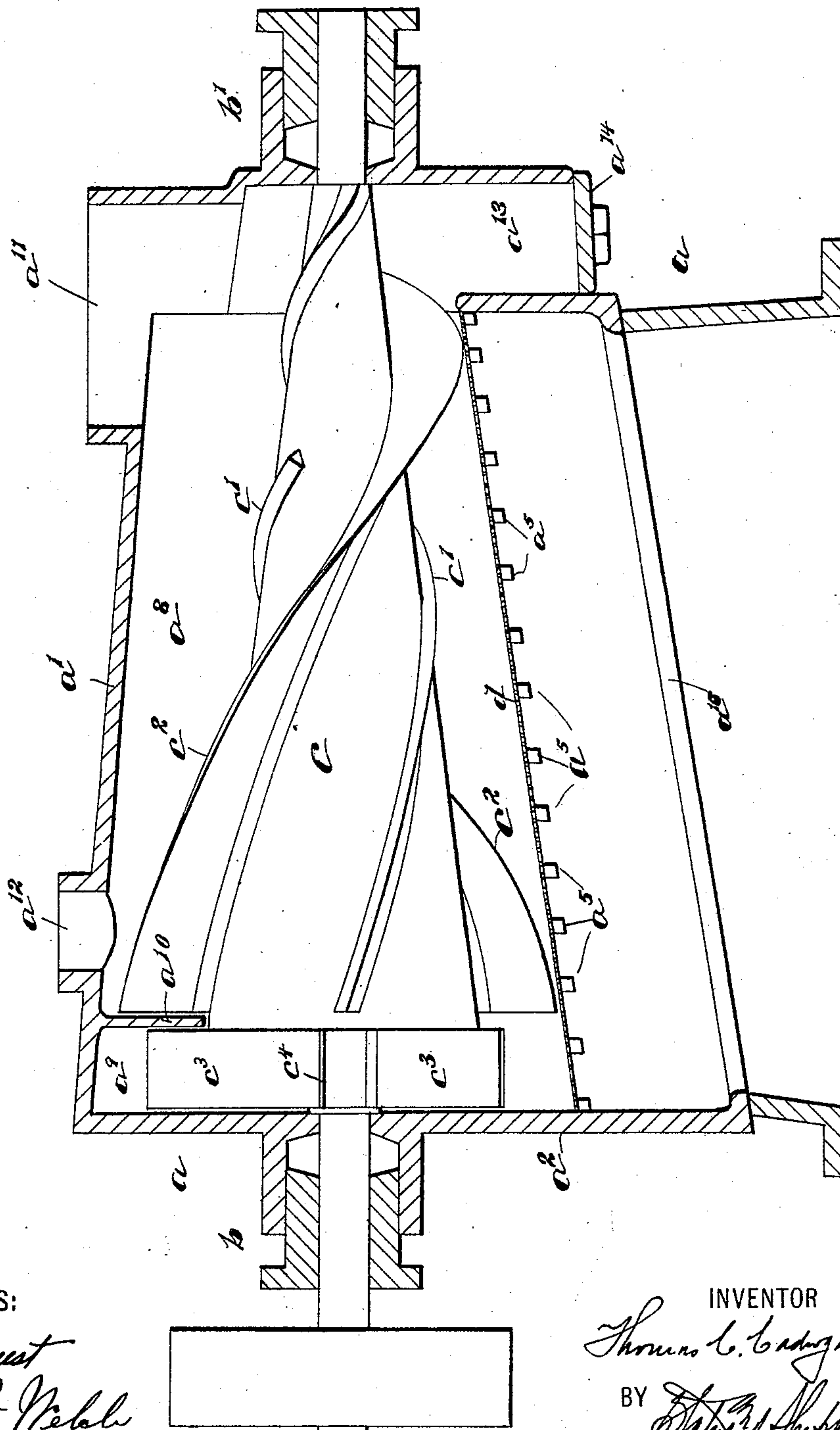
T. C. CADWGAN.

MACHINE FOR WASHING AND PREPARING PAPER STOCK.

No. 539,412.

Patented May 21, 1895.

Fig. 2



WITNESSES:

Fred Ernst
Chas. J. Welch

INVENTOR

Thomas C. Cadogan
BY *John A. Shepherd*
ATTORNEYS

(No Model.)

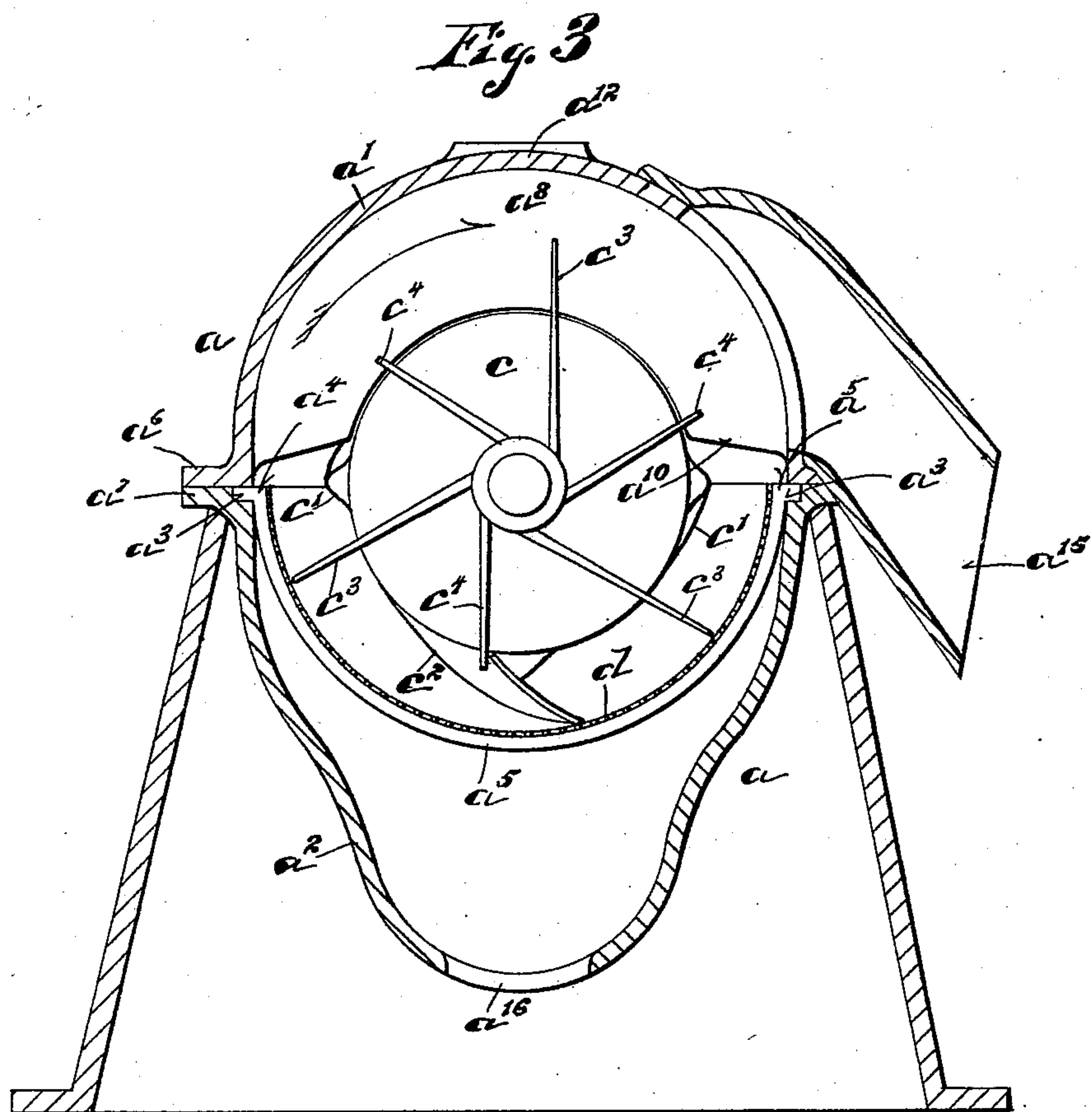
3 Sheets—Sheet 3.

T. C. CADWGAN.

MACHINE FOR WASHING AND PREPARING PAPER STOCK.

No. 539,412.

Patented May 21, 1895.



WITNESSES:

Fred Ernest
Chas. J. Welch

INVENTOR

Thomas C. Cadwgan
BY *Shepherd*
ATTORNEYS

UNITED STATES PATENT OFFICE.

THOMAS C. CADWGAN, OF ANDERSON, INDIANA, ASSIGNOR OF ONE-HALF TO
THE O. S. KELLY COMPANY, OF SPRINGFIELD, OHIO.

MACHINE FOR WASHING AND PREPARING PAPER-STOCK.

SPECIFICATION forming part of Letters Patent No. 539,412, dated May 21, 1895.

Application filed September 11, 1894. Serial No. 522,766. (No model.)

To all whom it may concern:

Be it known that I, THOMAS C. CADWGAN, a citizen of the United States, residing at Anderson, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Machines for Washing and Preparing Paper-Stock, of which the following is a specification.

My invention relates to improvements in machines for washing and preparing paper stock; the object of my invention being to provide a machine into which the stock may be fed continuously and be thoroughly washed and scoured while passing through the same and discharged therefrom after being separated from the water with which it is treated. I attain these objects by the constructions shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a transverse sectional view of the same, taken through the discharge pipe or opening.

Like parts are represented by similar letters of reference in the several views.

In the said drawings, *aa* represent an outer casing preferably formed of two parts *a'* *a''*, the two parts being adapted to join together so that the upper part *a'* is removable.

Journalled in suitable bearings *b b'* at each end of the casing, which bearings are also formed in the nature of glands or stuffing boxes to prevent leakage from said casing, is a revolving cylinder or rubber *c*, formed on its outer periphery with ribs *c'* and flexible wipers or rubbers *c''*, preferably made of leather or other suitable flexible material. These ribs or wipers are placed on the cylinder in a spiral direction, and the cylinder itself is tapered from end to end so as to be substantially conical in shape.

The bottom portion *a''* of the outer casing is recessed on each side, as shown at *a'''*, and adapted to receive projecting ribs or bars *a''''*, which extend from side to side of said casing on the arc of a circle whose center is at the center of the revolving cylinder *c*. On these bars is supported a screen *d*, having meshes sufficiently fine to prevent the escape of any of

the paper stock, but to readily permit the water to pass through the same.

The upper part of the casing *a'* is adapted to fit over the lower part *a''*, the respective parts having projecting flanges *a'''' a'''''*, adapted to be united together by bolts, or secured in any other suitable manner, the upper flange *a''''* resting on the bars *a''''''*, and thus serving to hold the screen firmly in position when the parts are united together. The rear or large end of the cylinder or rubber *c* is provided with a series of blades *c''' c''''*, each alternate blade *c'''* being preferably extended so as to run in close proximity to the screen *d*, which is extended from one end of the casing to the other. The other blades *c''''* are preferably made shorter and project slightly beyond the main body of the cylinder or rubber *c*.

The upper half *a''''* of the casing *aa* is formed eccentric to the revolving rubber *c*; that is to say, the top thereof is farther removed from the cone and its rubbers than the sides thereof so as to form a reservoir or rubbing chamber *a''''''* in the upper part of said casing. An auxiliary chamber *a''''''''*, in which the blades *c''' c''''* are adapted to extend is formed at the rear end of said casing by a partition *a''''''''''*, which extends downwardly from the upper half *a''''* of the casing *aa* to within close proximity to the main body of the rubber or cone *c*. This partition *a''''''''''* prevents the passage of the stock from the chamber *a''''''* to the chamber *a''''''''* in the upper half of the casing; the lower half of the casing, the bottom of which is formed of the screen *d*, having no such obstruction, so that the stock is carried down along the screen *d* before it can pass into contact with the blades *c''' c''''*.

The stock mixed with a sufficient quantity of water is admitted through the supply pipe or opening *a''''''''* at the small end of the casing and is carried by the ribs and wipers *c' c''* around with the rubbing cylinder.

The enlarged space or reservoir in the top of the casing is kept well supplied with water both by reason of the ample supply pipes and by being more or less retained therein by the action of the cylinder. The stock being carried around by the cylinder will follow the outer walls of the casing by the centrifugal

force, and will pass upwardly into the reservoir where it will be thoroughly rubbed, or, perhaps, more properly speaking, churned by the action of the ribs and wipers and the centrifugal force of the revolving cylinder.

An auxiliary opening a^{12} is provided in close proximity to the partition a^{10} through which a stream of water is introduced to come in contact with the stock prior to the time it passes through the chamber a^9 in contact with the lifting blades $c^3 c^4$.

To guard against damaging the screen or, other portions of the machine by the introduction of hard, foreign substance, I form immediately under the supply opening a^{11} a chamber a^{13} , having a removable plate a^{14} at the bottom thereof. This chamber is made of considerable depth and in the event that a heavy foreign substance enters with the stock, it drops into said chamber and may be removed by removing the plate a^{14} . If desired, this plate a^{14} may be secured so as to become disengaged under an unusual pressure and thus automatically release any hard foreign substance in the event that it should be forced into said pocket or chamber by the action of the revolving cylinder.

The stock is gradually carried by the ribs and rubbers along the screen d and forced into the chamber a^9 , where it is engaged by the lifting blades $c^3 c^4$, and carried around in contact with said screen and discharged through the outlet a^{15} .

It will be noticed that the blades $c^3 c^4$ are not radial but are formed tangent to a circle slightly larger than the shaft or journals of the revolving cone or cylinder; the effect being to incline the blades backwardly in the direction of travel, which causes the stock engaged thereby to be pushed to a slight extent outwardly in contact with the screen so as to press the water out of the same as it passes around with said blades, and also to more readily clear said blades and be discharged through the opening a^{15} by the revolution thereof.

The lower portion a^2 of the outer casing is extended downwardly and is provided with a suitable outlet opening a^{16} , through which the water is permitted to escape into any suitable trough or conduit by which it may be conveyed to any desired point of discharge.

By the constructions thus described I provide a machine in which paper stock may be continuously and effectually washed and prepared by simply passing it through said machine; the stock and the water in which it is washed or by which it is treated being separated effectually.

Having thus described my invention, I claim—

1. A machine for washing paper stock consisting essentially of an outer casing, an inner revolving cylinder having ribs or rubbers thereon, a closed chamber formed at the top of said casing above said cylinder, and a water

discharge at the bottom of said casing below said cylinder, and means for preventing the escape of the stock through the water discharge, substantially as specified.

2. In a machine for washing paper stock, the combination with an outer casing and an inner revolving cylinder, flexible wipers or rubbers on said cylinder, a concave screen in the bottom of said casing with which said rubbers are adapted to contact as the cylinder revolves, and an upper extended chamber formed in said casing above said cylinder, said chamber being closed at the top and provided with a water supply, substantially as specified.

3. The combination with an outer casing and an inner cone-shaped revolving cylinder, a concave screen formed concentric with said cylinder arranged in the bottom of said casing, and an enlarged chamber or reservoir in the top of said casing, and a partition extending downwardly in said reservoir to form an auxiliary chamber, and blades or lifting paddles secured to said cylinder and adapted to operate in said auxiliary chamber, and a discharge opening leading from said auxiliary chamber, substantially as specified.

4. The combination with the outer casing formed in two parts as described, the lower part being recessed at each side to receive the side bars of a screen retaining support, a concave screen supported on said side bars, a cone-shaped cylinder revolving in suitable bearings in said casing and formed concentric with said screen, a supply opening in said casing at the small end of said cylinder, and a discharge opening at the large end of said cylinder, and inclined blades or paddles on said cylinder revolving opposite said discharge opening, substantially as specified.

5. The combination with the outer casing having an inner revolving cone-shaped cylinder, ribs and wipers on said cylinder, and a screen in the bottom of said casing concentric with said cylinder, an enlarged chamber or reservoir in the top of said casing above said cylinder, and an auxiliary chamber divided from said reservoir by a partition extending downwardly from said casing, a water supply opening adjacent to said partition, and lifting blades or paddles connected to said cylinder and adapted to revolve in said auxiliary chamber, and a discharge opening leading from said auxiliary chamber, substantially as specified.

6. The combination with the outer casing formed at each end with suitable glands adapted to form bearings, a cone-shaped revolving cylinder revolving in said bearings, a concave screen in the bottom of said casing, an enlarged chamber or reservoir in the top of said casing, ribs or wipers arranged spirally on said cylinder, blades or paddles at the enlarged end of said cylinder, and a partition extending downwardly from the top of said casing to divide said wipers from said

paddles, a supply opening at the small end of said casing and a discharge opening at the large end of said casing, a pocket or chamber under said supply opening, and said discharge opening being arranged opposite the blades or paddles, substantially as specified.

7. The combination with an outer casing having an inlet or supply opening, and a pocket or chamber under the same, a concave screen extending from a point in proximity to said pocket or chamber to the rear end of said casing, spirally arranged ribs or rubbers on said cylinder adapted to revolve in proximity to said screen, and inclined blades or paddles also connected to the large end of said cylinder, each alternate blade or paddle being extended so as to run in close proximity to said screen, and a discharge opening opposite said blades or paddles, substantially as specified.

8. The combination with an outer casing having an upper enlarged chamber or reser-

voir, and a lower water discharge opening, a concave screen in the lower part of said chamber, and a revolving cone-shaped cylinder having wipers adapted to run in proximity to said screen, a partition in the upper part of said casing to form an auxiliary chamber, and inclined blades or paddles operating in said auxiliary chamber, a supply opening leading to said chamber, and a pocket or chamber under said supply opening, a water inlet arranged in proximity to said partition and extending into said chamber or reservoir, and a discharge opening leading from said auxiliary chamber to a point above the center of said cone or cylinder, substantially as specified.

In testimony whereof I have hereunto set my hand.

THOMAS C. CADWGAN.

Witnesses:

ROBERT C. RODGERS,
CHAS. I. WELCH.