

No. 667,902.

Patented Feb. 12, 1901.

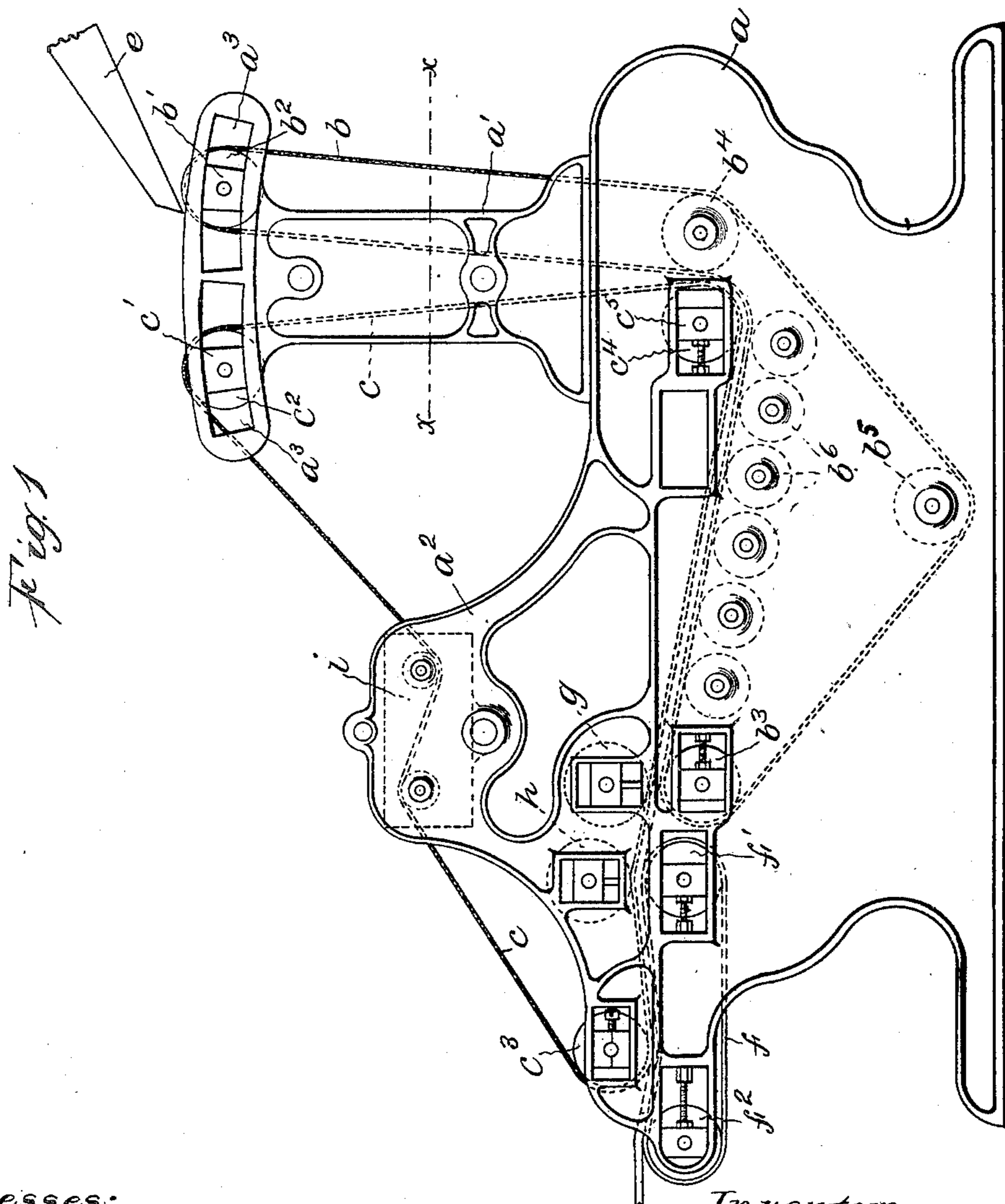
C. H. CASE & J. GRAY.

MACHINE FOR MAKING PAPER OR THE LIKE.

(Application filed Feb. 12, 1900.)

(No Model.)

2 Sheets—Sheet 1



Witnesses:
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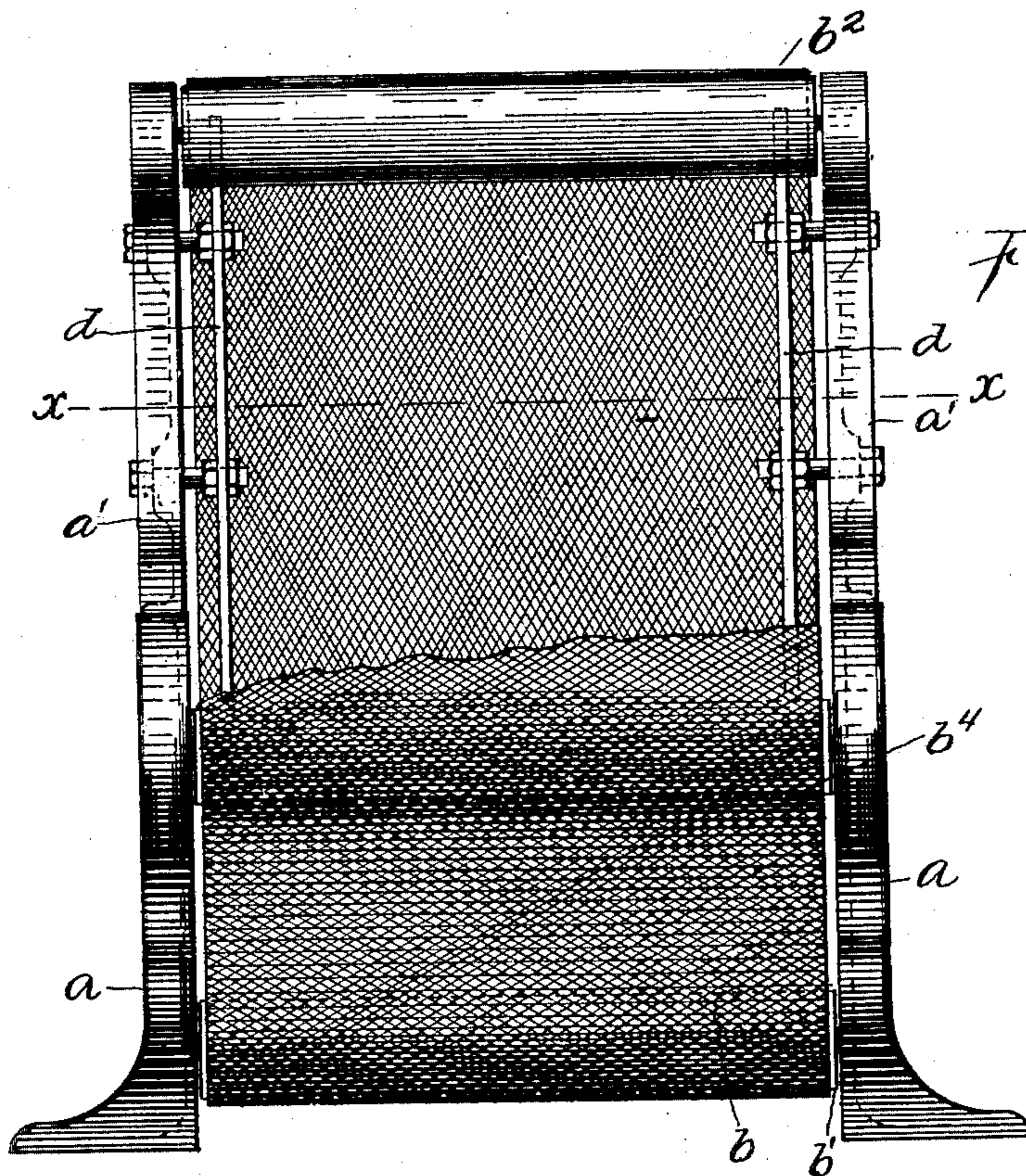


Fig. 2

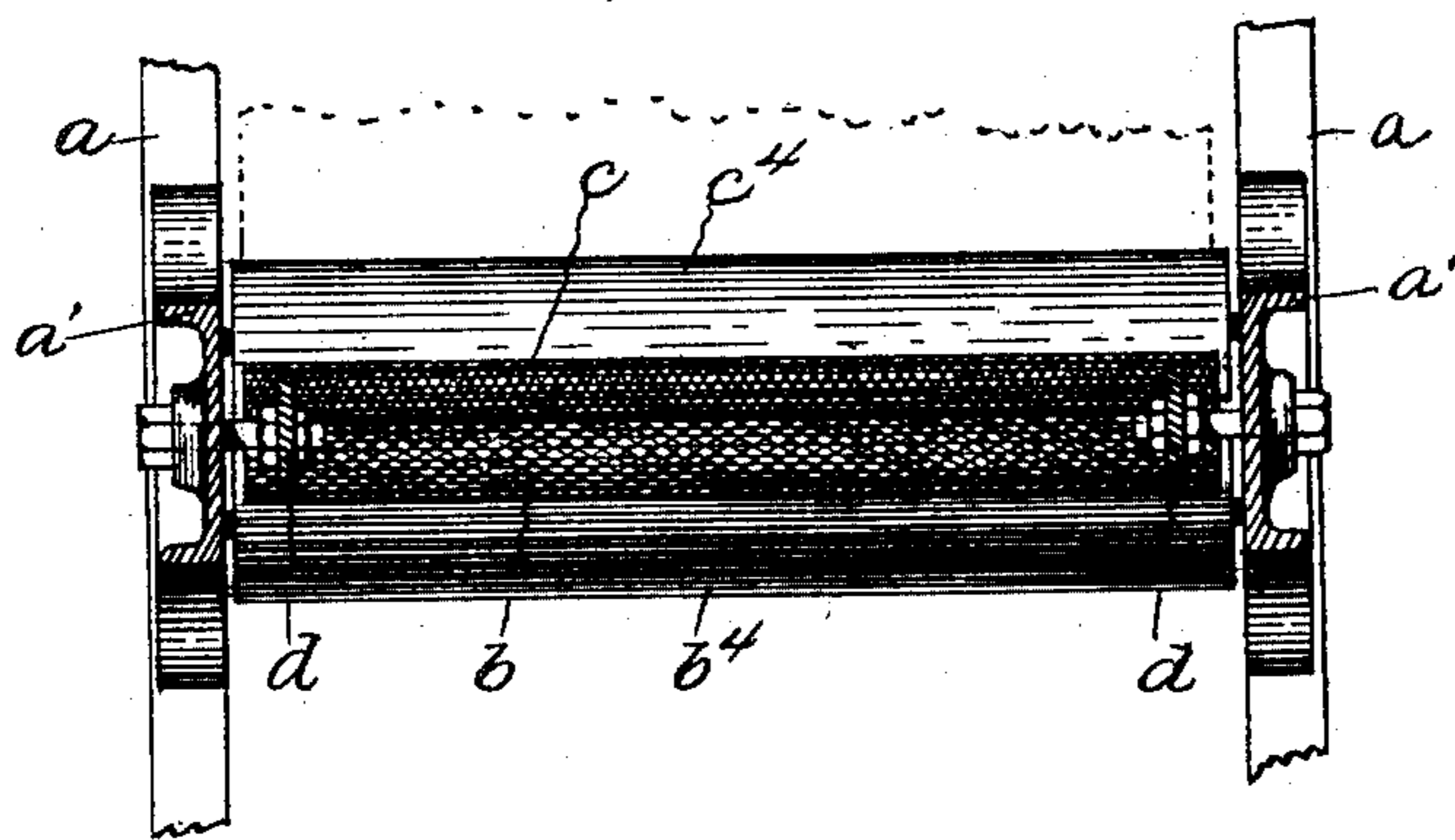


Fig. 3

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UNITED STATES PATENT OFFICE.

CHARLES H. CASE, OF HIGHLAND PARK, AND JOHN GRAY, OF MANCHESTER, CONNECTICUT; SAID GRAY ASSIGNOR TO SAID CASE.

MACHINE FOR MAKING PAPER OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 667,902, dated February 12, 1901.

Application filed February 12, 1900. Serial No. 4,888. (No model.)

To all whom it may concern:

Be it known that we, CHARLES H. CASE, a resident of Highland Park, and JOHN GRAY, a resident of South Manchester, in the county of Hartford and State of Connecticut, citizens of the United States, have invented a new and useful Machine for Making Paper or the Like, of which the following is a specification.

Our invention relates to the manufacture of sheets or continuous lengths of fabric from pulp of various materials, either paper-pulp or waste scraps of fibrous material of any kind, and more particularly to the manufacture of sheets of considerable thickness.

One object of the invention is to provide a machine in which sheets of material may be formed of a desired width and thickness and also of a density to enable otherwise waste scrap of fibrous material to be utilized in the making of various articles in common use.

It is also our object to produce the sheets of paper-pulp or like material with a mixture of foreign material which is more evenly disposed throughout the mass than is possible by prior methods and machines.

One form of machine in which these objects may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation of the machine with parts shown in dotted outline. Fig. 2 is an end view with parts broken away to show construction, and Fig. 3 is a top or plan view of that part of the machine which includes the hopper.

In the accompanying drawings the letter *a* denotes the frame of the machine, that may be constructed of any desired material and of any desired form for the purposes in hand and includes uprights *a'*, extending from the main part of the frame and a support *a²* for a wire washing-tank. Guideways *a³* are formed through the upper part of each of the uprights *a'*, each of these guideways being formed on the arc of a circle having the axis of the respective supporting-rolls located at the lower end of the hopper, to be hereinafter described, for a center. Bearing-blocks *b' c'* for making-wire rollers *b² c²* are adjustably supported in these guideways, and making-wires *b c* pass over these rollers and also over other making-wire rollers *b³ c³*, supported on the main part

of the frame. These making-wires are of common construction, but have a novel arrangement. The making-wire *b* passes from the roller *b²* to the guide-roll *c⁴* over the lower wire roller *b³* on the main part of the frame, and thence to the guide-rolls *b⁵ b⁴* to the upper wire roller *b²*. Supporting-rollers *b⁶* are mounted in the frame in position to support the horizontal part of the making-wire. The making-wire *c* passes over the upper wire roller *c²*, downward about the guide-roll *c⁴*, over the lower roller *c³* to the upper wire roller *c²*. The upper wire rollers *b² c²* are located some little distance apart and are adjustable toward and from each other, while the guide-rolls *b⁴ c⁴* are located comparatively near each other, so that the making-wires are caused to approach each other in their descent. The guide-roll *c⁴* is supported in bearings *c⁵*, adjustable toward and from the guide-roll *b⁴*, so that the distance between the making-wires at this point may be varied.

Side parts *d* are secured to the uprights *a'* in a manner to provide for adjustment toward or from each other. The edges of these side parts are located close to or rest against the making-face of the making-wires, these side parts and making-wires forming a hopper to which stuff mixed with a sufficient quantity of water is supplied from the trough *e*. These side parts form a species of deckle to determine the width of the sheet of paper being made in the machine.

An endless felt *f* is supported on rollers *f' f²* and conducts the web of paper from the making-wires to further operating devices, as press-rolls, drying-cylinders, or the like, which may be arranged as to kind or number to properly complete any special work which is being turned out by the machine.

Press-rolls *g h* are mounted on the main frame part *a*, the former acting with the lower wire-roller *b³* and the latter acting in connection with the felt roller *f'* to further compress the web of paper as it passes between said parts. In its movement from the lower making-wire roller *c³* to the upper wire-making roller *c²* the making-wire *c* passes through a tank *i*, located between the supports *a²* of the frame.

By this invention we have constructed a

machine that possesses the advantages of the Fourdrinier and of a cylinder-machine without the disadvantage of either, the machine being capable of forming the stuff into a sheet of any desired thickness from the thinnest to the thickest.

It is to be noted that the stuff is delivered to the hopper, two of the opposing sides of which are formed of the making-wires that travel from the top to the bottom of the hopper and approach each other as they near the bottom. The stuff is supplied to the hopper mixed with a large amount of water and in quantity sufficient to maintain the level of the stuff within the hopper at the required height. As the fluid mass descends under the action of the traveling making-wires it is gradually compressed more and more as it nears the bottom of the hopper, the water at the same time being forced out to a degree through the making-wires composing the walls of the hopper. The adjustable side parts determine the width of the sheet, and by the time the sheet passes around the guide-roll c^4 at the bottom of the hopper the mass of fiber is formed into a sheet of quite regular consistency and very homogeneous. From this point it is carried along, passing between the lower making-roll b^3 and the press-roll g , and thence between the felt roll f' and press-roll h , from which point it is conducted to further press-rolls or drying-cylinders, as may be desired.

An advantage derived from this construction resides in the fact that foreign material, as quite large strips or pieces of tobacco-stalks or the like, can be regularly distributed throughout the mass as it is formed into a sheet, thus giving to both sides of the sheet when finished all of the advantages which may reside in a fabric by reason of the presence of such material therein, the surface of both sides of the sheet being alike and capable of use.

The term "making-wire" has been used throughout the specification and in the claims to designate those parts which act upon the pulp while contained in the hopper and for removing it therefrom; but we do not desire to limit ourselves to a making-wire in the sense that it shall be composed of a metal fabric, as it is intended and understood that any fabric which accomplishes the desired result shall be within the intent and scope of the invention and included in the term "making-wire" as used herein.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a paper-making machine, in combination, a frame, traveling making-wires supported on the frame and arranged to form opposing sides of a hopper of less cross-sectional area at the bottom than at the top, the hopper, means for controlling the amount of material delivered from the bottom of the hopper, means for delivering stuff to the hop-

per, and means for conducting the web from the making-wires.

2. In a paper-making machine, in combination, a frame, angularly-arranged traveling making-wires supported on the frame and portions of which form opposing sides of a hopper of less cross-sectional area at the bottom than at the top the other portion of each of said wires forming means for removing the stuff from the bottom of the hopper, the hopper, and means for delivering stuff to the hopper.

3. In a paper-making machine, in combination, a frame, traveling making-wires supported on the frame and arranged to form opposing sides of a hopper, the hopper having its two remaining sides each located within the edge of the making-wires and having means for adjustment toward or from each other, means for causing the wires to travel, means for delivering stuff to the hopper, and means for conducting the web from the making-wires.

4. In a paper-making machine, in combination, a frame, traveling making-wires supported on the frame and forming two opposing sides of a hopper which sides are located nearer each other at the bottom than at the top of the hopper, and one part of the path of a making-wire being located at an angle to that part forming a wall of the hopper, the hopper, means for causing the wires to travel and means for delivering stuff to the hopper.

5. In a paper-making machine, in combination, a frame, traveling making-wires supported on the frame and forming two opposing sides of a hopper which sides are located nearer each other at the bottom than at the top of the hopper, one portion of each making-wire being located at an angle to that part forming a side of the hopper, the hopper, means for causing the wires to travel and means for delivering stuff to the hopper.

6. In a paper-making machine, in combination, a frame, traveling making-wires supported on the frame and forming two opposing sides of a hopper which sides are located nearer each other at the bottom than at the top of the hopper, one portion of each making-wire being located at an angle to that part forming a side of the hopper, the hopper, means for causing the wires to travel, means for delivering stuff to the hopper and press-rolls located in operative relation to the making-wires.

7. In a paper-making machine, in combination, a frame, traveling making-wires supported on the frame and forming two opposing sides of a hopper which sides are located nearer each other at the bottom than at the top of the hopper, a roller supporting each making-wire near the top of the hopper, rollers supporting said wires on the main part of the frame, the hopper, means for delivering stuff to the hopper, guide-rolls located near the bottom of the hopper in position to form

an angle in the path of movement of each making-wire, and means for causing the wires to travel.

8. In a paper-making machine, in combination, a frame, traveling making-wires forming two opposing sides of a hopper and one wire having a part arranged at an angle with the part forming a wall of the hopper, the hopper, means for delivering stuff to the hopper, supporting-rolls operatively located with respect to the angularly-arranged making-wire, means for causing the wires to travel, and means for delivering the web from the making-wires.

9. In a paper-making machine, in combination, a frame, making-wires supported on the frame and arranged to form opposing sides of a hopper of less cross-sectional area at the bottom than at the top, one part of the path of each wire being located at an angle to that part forming a side of the hopper, side parts adjustable toward or from each other and forming opposing sides of the hopper, means for causing the wires to travel, and means for delivering the stuff to the hopper.

10. In combination, a bed, traveling making-wires mounted on the bed and forming a portion of a vertically-arranged hopper, means for adjusting the making-wires angu-

larly with respect to each other, means for propelling said wires, means for delivering stuff to said wires, and means for removing the material from said making-wires.

11. In combination, a bed, traveling making-wires mounted on the bed and adjustable at an angle with each other, side parts forming with said wires a hopper, means for adjusting the angular position of said wires, means for propelling the making-wires, means for delivering stuff to said wires, and means for removing material from said wires.

12. In combination, a bed, a traveling making-wire mounted on the bed and with one part arranged at an angle to the other part, another making-wire arranged at an angle with one of said parts, means for adjusting the angular position of the two making-wires with respect to each other, means for propelling the making-wires, means for delivering stuff into the angle between said wires, and means for removing material from said wires.

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