

(No Model.)

2 Sheets—Sheet 1.

J. WATT.
CYLINDER VAT FOR PAPER MAKING MACHINERY.
No. 464,537. Patented Dec. 8, 1891.

FIG. 1.

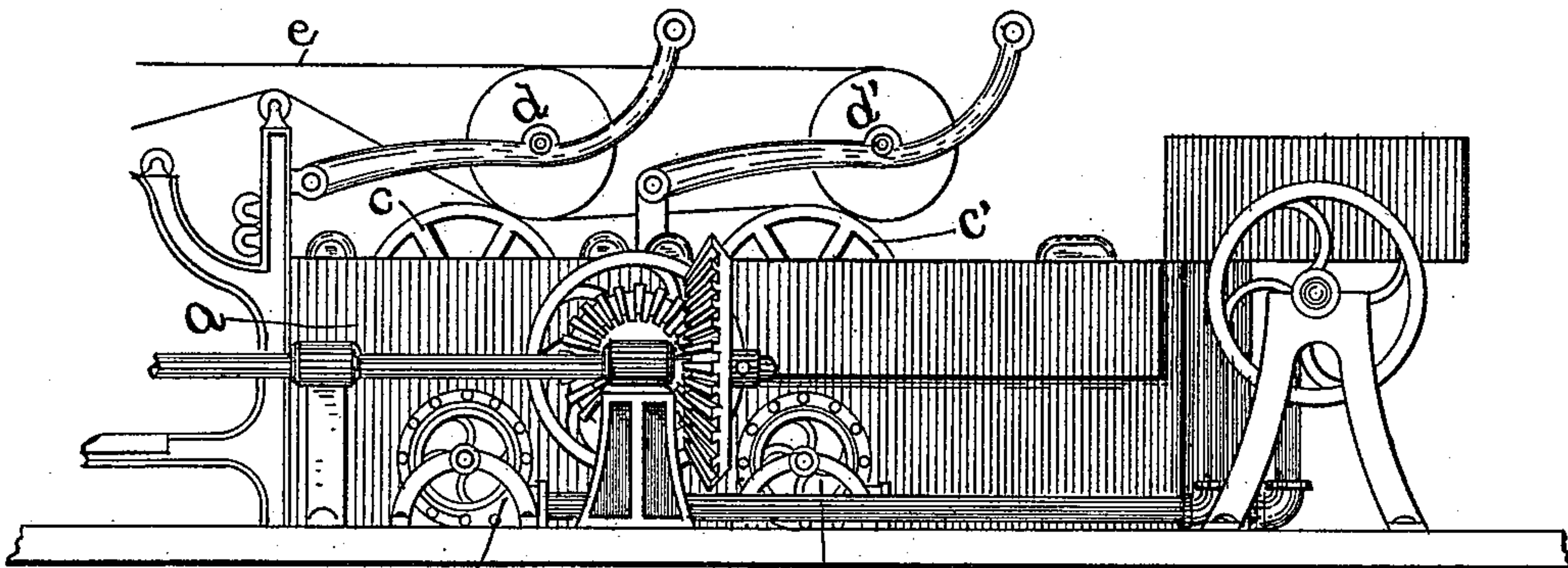
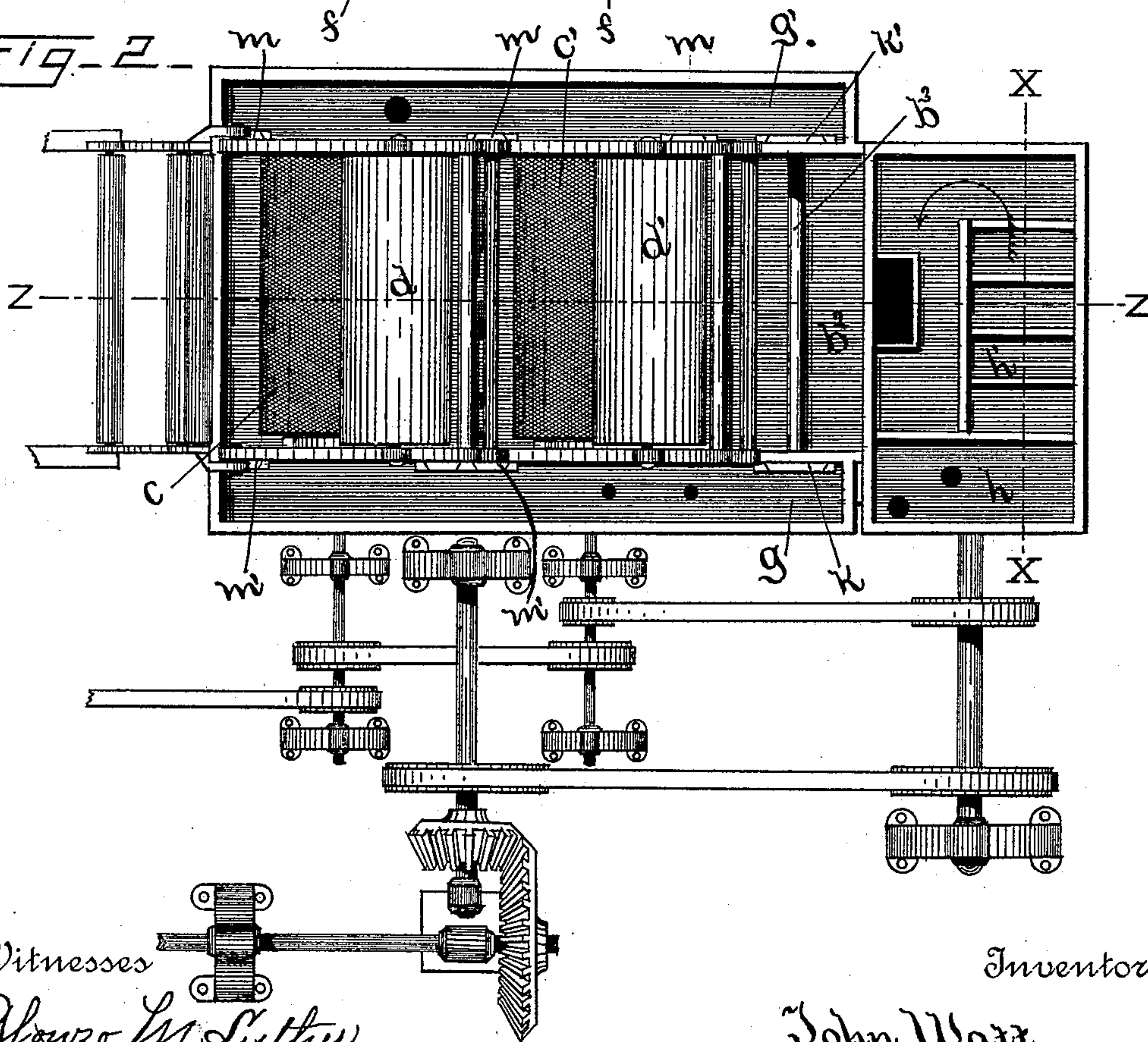


FIG. 2.



Witnesses

Abago M. Luthu.

Allen Tenny.

Inventor

John Watt.

By his Attorney

Frank H. Allen.

(No Model.)

2 Sheets—Sheet 2.

J. WATT.

CYLINDER VAT FOR PAPER MAKING MACHINERY.

No. 464,537.

Patented Dec. 8, 1891.

Fig-3-

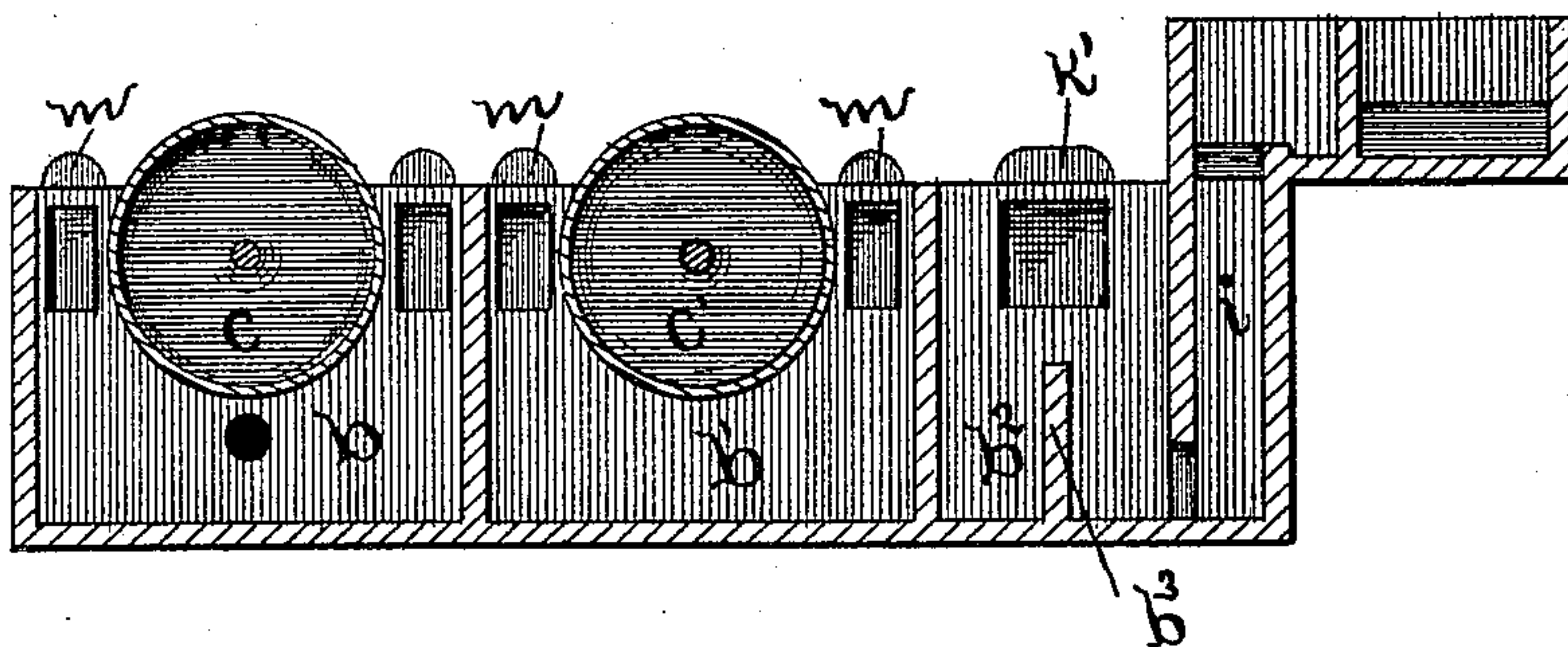
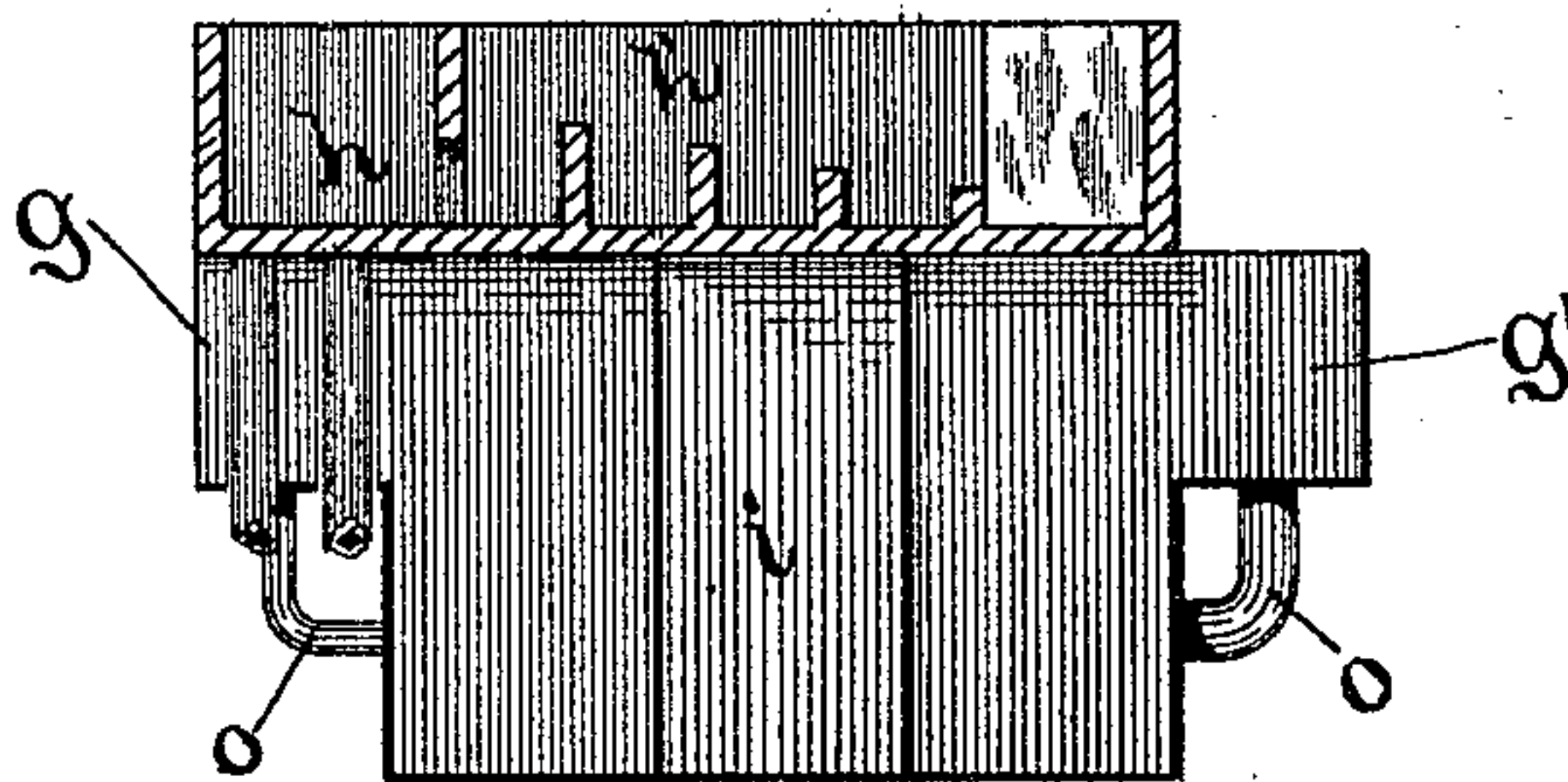


Fig-4-



Witnesses

Alonzo M. Luther.
Allen Terry.

Inventor

John Watt.
By his Attorney
Frank H. Allen.

UNITED STATES PATENT OFFICE.

JOHN WATT, OF QUAKER HILL, CONNECTICUT.

CYLINDER-VAT FOR PAPER-MAKING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 464,537, dated December 8, 1891.

Application filed June 22, 1891. Serial No. 397,121. (No model.)

To all whom it may concern:

Be it known that I, JOHN WATT, a citizen of the United States, residing at Quaker Hill, in the county of New London and State of Connecticut, have made certain new and useful Improvements in Cylinder-Vats for Paper-Making Machinery, which improvements are fully set forth and described in the following specification, reference being had to the accompanying two sheets of drawings.

This invention relates to so-called "cylinder machines" for making paper in continuous web; and said invention has for its particular object the improvement of the mixing-chamber and vats, to the end that the pulp shall be more perfectly freed from grit or other foreign substances and more freely delivered to and uniformly distributed on the mold rolls or cylinders.

In explaining my invention I have provided the annexed drawings, in which—

Figure 1 is a side elevation of a duplex vat with the mold-rolls and other connecting parts of a paper-making machine necessary to the working of my new invention. Fig. 2 is a top or plan view of the same parts. Fig. 3 is a vertical sectional view of Fig. 2, taken on line $z z$, with the couch-rolls removed; and Fig. 4 is a vertical sectional view of the mixing-chamber, taken on line $x x$ of said Fig. 2.

Referring to the drawings, the letter a indicates a vat, into which the pulp flows after passing through the mixer, the vat, as here shown, being divided into three independent or separate compartments b , b' , and b^2 . In compartments b b' are located mold rolls or cylinders c c' , each of which has the customary couch-rolls d d' , and around these couch-rolls passes an apron e , that conveys the web of pulp to the press-rolls. Mold-rolls c c' are jacketed with wire-cloth of fine mesh. One end of said rolls is closed and the other has an opening near the shaft, out of which flows water drained from the pulp, a vacuum being maintained within said rolls by means of exhaust-pumps f . The pressure of fluid within the vat forces the pulp against the wire-cloth, when the water is (by reason of the vacuum) drawn within the rolls, leaving the pulp pressed against the wire-cloth jacket. As the cylinder revolves, the pulp attached to it is carried upward and forms a web on

the cylindrical surface, from which it is removed in a continuous sheet by a roll that presses the cylinder at or near its highest part. The upper or couch roll is ordinarily covered with several thicknesses of felt and is weighted to press out the water from the pulp. The arrangement of parts thus far described is the same as in cylinder-machines as commonly used, except that the compartment b^2 is not provided.

My invention consists in adding to the described machine this compartment b^2 , also side wings g g' , a series of gates connecting said side wings with the vats proper, also a novel form of mixing-box and sand-catcher, and in novel combinations of said new and old features, all of which are fully described hereinafter.

The pulp, as it comes from the beater, flows into section h of the mixing-chamber, and passes thence into the sand-catching chamber h' , which is provided with a series of cross-partitions, which are successively of lesser height, and from thence said pulp passes downward through a chute or pipe i , that leads into the bottom of compartment b^2 , as best understood by reference to Fig. 3 of the drawings. In this chamber b^2 is a centrally-located cross-partition b^3 , extending upward above the level of the opening leading from the chute i , the location of partition b^3 being such that the pulp as it rushes from said chute into compartment b^2 engages said partition and is checked and thrown forcibly upward, thus serving to agitate the pulp and hold it in solution instead of permitting it to settle to the bottom of chamber b^2 , as would result if the pulp were introduced at the top of said chamber. No direct communication between chamber b^2 and the vats b' is provided; but when it is desired to introduce the pulp into said vats the side wings g g' , which form features of my invention, are brought into use in the following manner: Between the wings and compartment b^2 are gates k k' , which serve to cover openings leading outward from said chamber, and which may be raised to allow the pulp to pass outward into one or both of said wings. The pulp may then pass freely along said wings and fill the same.

m m' denote other similar gates covering

openings that lead from the said wings into vats $b\ b'$, in which the mold-rolls are located. When the said wings are filled with pulp, these gates $m\ m'$ may be raised and the pulp 5 allowed to flow into either of the described vats. It will be noted that the pulp is thus introduced to the vats near their top or upper portion.

Heretofore it has been a common thing to 10 introduce the pulp near the bottom of the vats; but under such conditions the mass of pulp is kept constantly agitated, and sand or other foreign substance that may have been carried along with the pulp is prevented from 15 separating and settling by gravity in the vat.

In my present arrangement the pulp may be introduced near the top of the vat while the lower portion is comparatively at rest, and such foreign substance is free to settle to the 20 bottom. A multiple of gates $m\ m'$ may be provided, so that pulp may be introduced at either or both ends of the mold-rolls. The current and flow of pulp from the side wings $g\ g'$ into the vats may be thus readily controlled. Either of the mold-rolls may be operated independent of the other or both may be used at the same time. Pipes o may be provided, if desired, to connect the wings with the lower portion of the vats, these pipes being 30 convenient at times to create a swirl or eddy whenever it is desired to stir up or agitate the pulp at the bottom of the vats, and said pipes may also be utilized for the purpose of introducing water into the vats when it is 35 desired to wash out the latter. In the mixing-chamber the succession of partitions, gradually reducing in height, as I have above described, provide a multiple of pockets to collect grit and similar foreign substances. 40 The liquid fills the first pocket, then overflows into the second, and so on through the entire series, the grit or other foreign substance therein being gradually precipitated toward the bottom and checked by the successive partitions. 45

My improvements do not add materially to the cost of complete machinery of this class, yet they provide a more perfect distribution of the pulp than has been accomplished heretofore. 50

One very valuable result of my invention is seen in the fact that I am able to direct the flow of pulp into the vats $b\ b'$ in such manner that the grain or fiber of the paper may be 55 laid lengthwise or crosswise of the web, as may be desired. In a two-cylinder machine, as here shown, it is a well-known fact that the paper when finished may be torn in one direction quite easily, while it appears to be 60 stronger or tougher when torn in certain other directions, the reason for such difference being in the fact that the fiber is laid in the same direction by both cylinders.

In my present form of machine I am able

to control the inflow of pulp to the vats and 65 cylinders, so that the fiber as laid on one of said cylinders shall be lengthwise of the web of paper and the fiber as laid by the other cylinder shall be crosswise of said web, the paper so made being tougher than that 70 produced by machines of this class as now commonly operated and tearing the same in either direction. To produce this result, (the crossing of fiber,) the pulp may be introduced to one of the vats through pipes o . The pulp 75 rises and fills the vat and is deposited on the wire-cloth cylinder. When the pulp is so introduced and there is no appreciable swirl or current in the vat, the tendency of the revolving cylinder is to lay the fiber lengthwise of 80 the web. Assuming now that the pulp is introduced into the vat b' through a gate m at opposite ends of said cylinder and at opposite sides of the same—that is to say, at opposite corners of the vat—the rush of pulp 85 through the gates causes a current that moves lengthwise of the cylinders and tends to lay the fiber in the same direction, so that when the pulp is taken from the cylinder c' and deposited on the pulp previously taken from the 90 cylinder c the fiber from the cylinders is laid in opposite directions.

Having described my invention, I claim as new and wish to secure by Letters Patent—

1. In combination with the vats and mold-rolls of a cylinder paper-making machine, wings or troughs located at each side of the vats and connected therewith by gated openings, substantially as and for the objects 95 specified. 100

2. In combination with the vats and mold-rolls of a paper-making machine, side wings or troughs with gated openings leading into said vats, an auxiliary vat b^2 , with gated opening leading into said troughs, as set forth, and 105 a mixing-chamber having a delivery-opening leading into said auxiliary vat, all substantially as and for the objects specified.

3. In combination with the vats and mold-rolls of a paper-making machine, side wings or troughs with gated openings leading into said vats, and a mixing-chamber connecting with said vats and having a series of sand-catching pockets formed by a succession of partitions of gradually-reduced height, all being substantially as and for the purpose specified. 110 115

4. In combination with the vats and mold-rolls of a paper-making machine, an auxiliary vat b^2 , side wings or troughs with gated openings connecting the entire series of vats, 120 as set forth, and a mixing and sand-catching chamber having a delivery-chute leading into the said auxiliary vat near its bottom, all substantially as and for the purpose specified.

JOHN WATT.

Witnesses:

ALONZO M. LUTHER,
FRANK H. ALLEN.