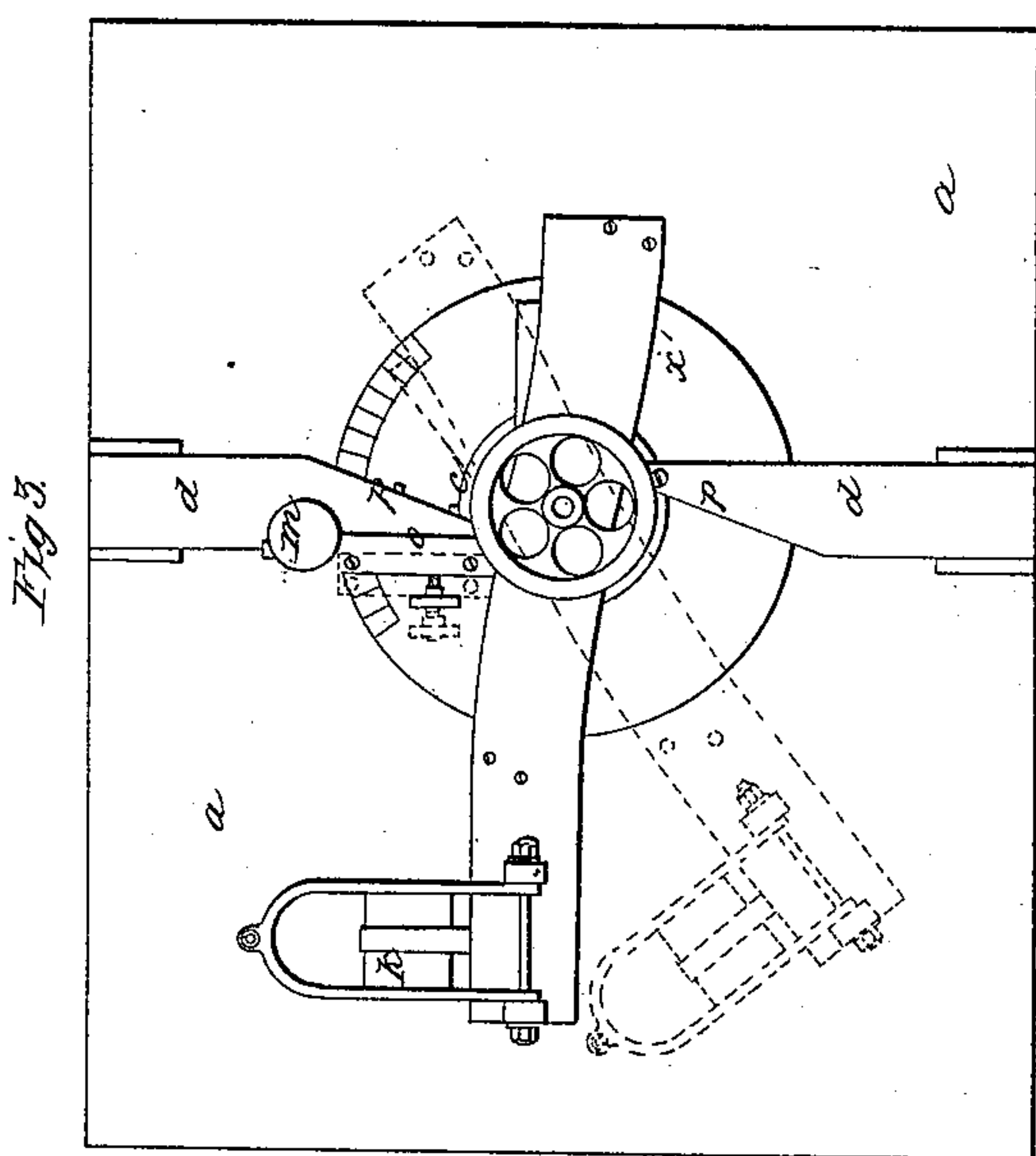
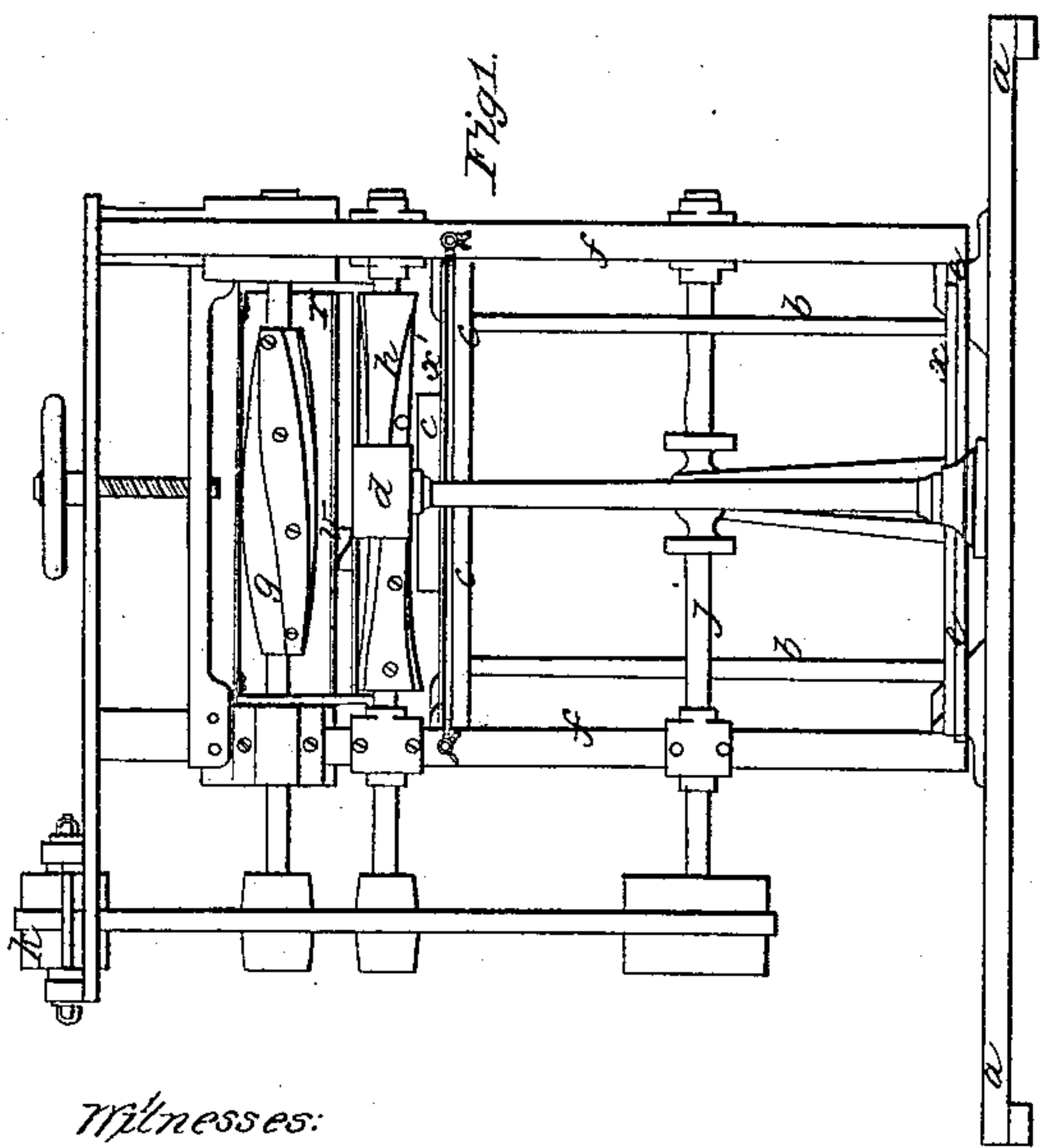
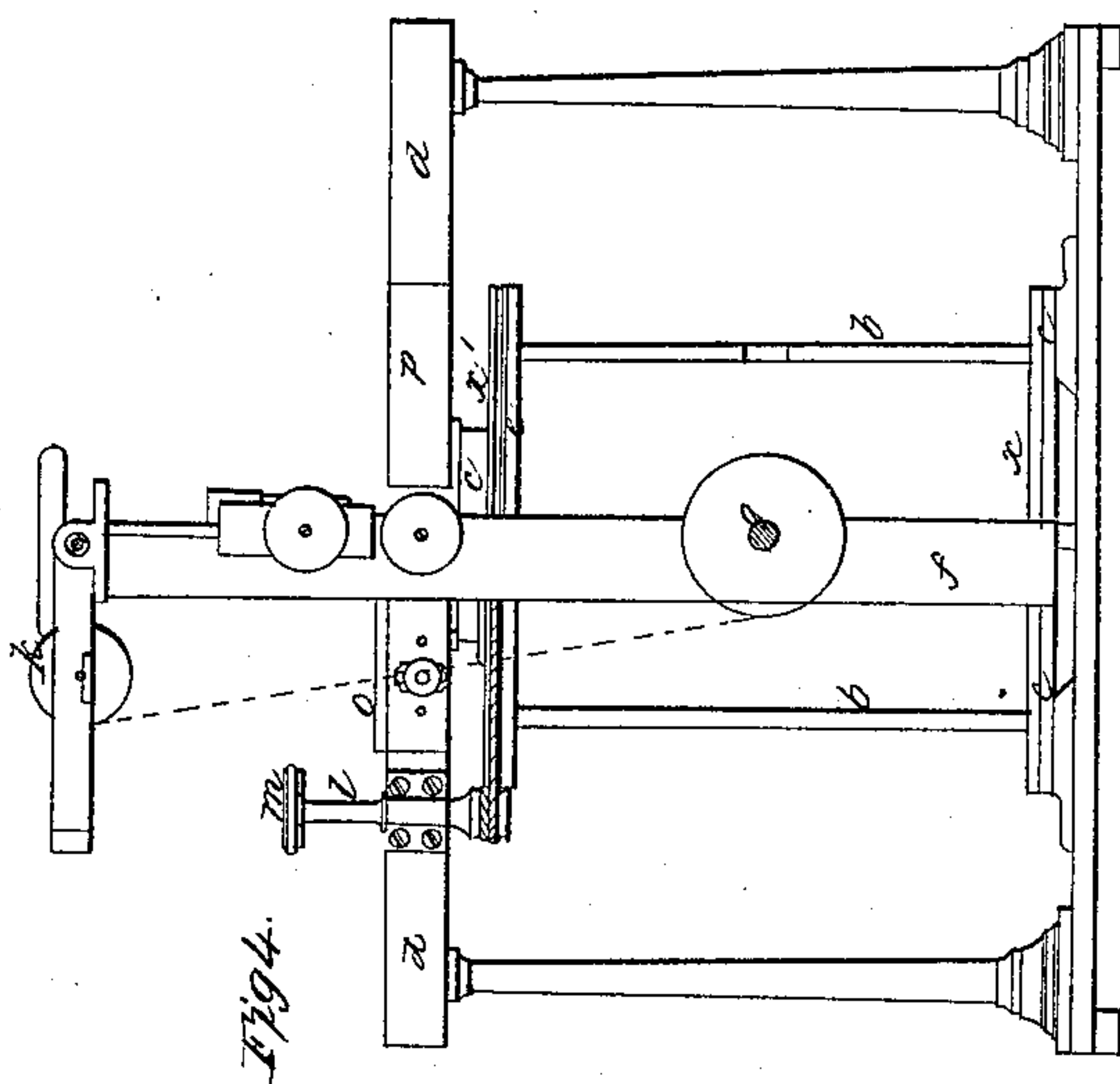
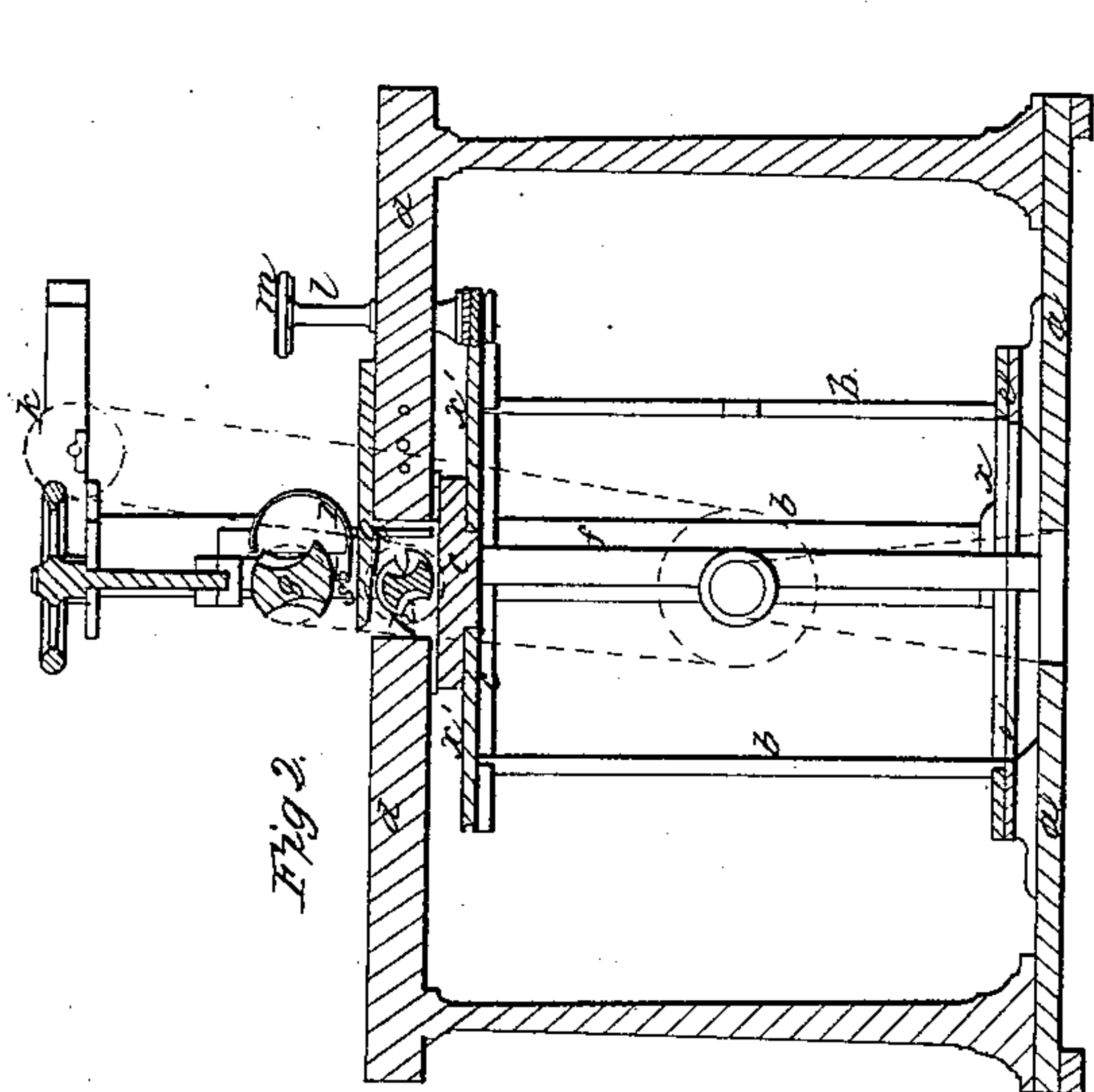


J. Green,

Wood Planing Machine.

N^o 28,808.

Patented June 19, 1860.



Witnesses:

*Oliver B. Higgins
John C. Thompson*

Inventor:

John Green

UNITED STATES PATENT OFFICE.

JOHN GREEN, OF BROOKLYN, NEW YORK, ASSIGNOR TO NATHAN THOMPSON, JR., OF
SAME PLACE.

MACHINE FOR PLANING WARPED SURFACES.

Specification of Letters Patent No. 28,808, dated June 19, 1860.

To all whom it may concern:

Be it known that I, JOHN GREEN, of the city of Brooklyn, in the county of Kings and State of New York, have invented a certain
5 new and useful Apparatus for Reducing Plank So That When Worked They Shall Have a Warped or Twisted Surface; and that the following specification, taken in connection with the drawings, is a full,
10 clear, and exact description thereof.

In the drawings Figure 1 is a front elevation of the machine. Fig. 2 is a vertical section lengthwise of the same. Fig. 3 is a top view of plan of the machine, and Fig. 4
15 is a side elevation thereof.

My apparatus has been devised with special reference to the working of plank for planking up small boats; plank fitted for that purpose, having a twisted or warped surface
20 on both sides the one irregularly convex, and the other irregularly concave, the latter being applied to the ribs or timbers of the boat, which have convex curves of different curvature at points equidistant from the keel, but at varying distances from the bow or stem of the boat. A plank in order to fit the various ribs to which it is attached must have a convexity or guttering of different extent at different
25 points of its length, and in order to make the boat fair, with the lines on its planking corresponding to those that can be drawn over its ribs, the outer surface of the plank should be parallel to the inner surface or
30 nearly so.

My apparatus will work plank to an irregular or warped curved surface on either or both sides and if desired with the surface of the one side parallel to that of the other
40 and hence it will be useful for the production of such surfaces irrespective of the precise use to which they may be applied.

My apparatus in its essentials, consists of one or more rotating cutters, arranged in a frame constructed in such manner that it can be turned or, rotated about an axis, when combined with a stationary table or equivalent support along which the plank to be worked is to be fed either by hand or by
45 any proper machinery, and one or both of the cutters must have knives of such a shape as will cut either a concave or a convex surface.

In the drawings the bed plate of the ma-

chine which may be the floor of the shop 55 is shown at *a, a* and from it rise standards *b, b*, which support a circular plate or table *c*, and other standards which support the ends of a feeding table *d, d*, whose other ends rest upon and are secured to the cir- 60 cular plate. Just above the bed plate is secured a circular guide and support *e, e*, whose center is vertically under the center of the circular plate *c*. The two circular plates are embraced by two posts *f, f*, which 65 are secured to movable circular plates *x, x'* resting upon the upper and lower stationary circular plates, and projections if deemed necessary may extend from the posts under either or both of the stationary cir- 70 cular plates, or the inner edge of the lower moving plates may enter notches in the posts *b, b*. These posts *f, f*, are framed together at the top and are fitted with boxes, slides and adjusting apparatus carrying 75 and governing two rotating cutters *g*, and *h*, the former so shaped as to cut a gutter or hollow in a plank submitted to its action, and the latter (*h*) so formed as to round up at the center any board that may be passed 80 over it. Cutter *g*, is convex and cutter *h*, is concave. Between the two circular plates a shaft *j* is supported in proper boxes in the posts *f, f*, and at the center of this shaft, measuring between the boxes, is a pulley 85 turned off, so as to be a portion of a spherical surface or nearly so, and at the outer end of this shaft is another pulley carrying a belt, which passes over a tightening pulley *k*, and partially around two other pulleys, 90 each secured at the end of one of the shafts that carries a cutter (see red lines in the drawings) the whole arrangement being such that the lower shaft may be revolved by a belt although this shaft (*j*) may change its 95 angular position relatively to the shaft which drives the belt, and such that the shaft *j*, shall through the instrumentality of belts and pulleys cause the cutters to revolve. The stationary circular plates serve 100 as guides and supports for the movable circular plates, and consequently, for the posts *f, f*, and the frame and cutters that they convey; and the posts, framing, and cutters are free to revolve around the stationary 105 plates and consequently around the centers of the circles of the plates, a line passing through which, would pass through the cen-

ter of the cutter, shaft, or nearly so. One end of a cord of hemp, wire or catgut is secured to one of the posts passes partially around the upper moving circular plate, then
 5 completely round a small pulley on an upright shaft *l*, provided with a hand wheel *m*, and then partially around the same circular plate to the other post, to which the other end of the cord is to be secured and the
 10 whole is to be drawn tight. By turning the hand wheel, the posts, frame and cutters, may be turned so that the axes of the cutters may form different angles with a line drawn along the edge of the feeding table, (see red
 15 lines in the top view or plan).

On one side of the feeding table is fastened an adjusting guide *O*, and the tables, or the front and rear ends of the tables, are beveled off as at *p, p*, so as to allow the lower
 20 cutter to turn with the posts *f*, and moving circular plates. A rest bar stands just in front of the lower cutter. It is attached to the posts (turns when they are turned), and its upper surface when properly adjusted,
 25 should be level with the lowest depression of the concave cutter. Over the rest the plank to be planed, passes on its way from the front part of the table to the cutters. Directly above this rest hangs a strong, and
 30 heavy swinging shield *r*, shown only in figures first and second. This shield is pivoted upon the posts *f, f*, as at *s*, turns when the posts turn, and bears with its whole weight or, nearly so, upon the upper surface
 35 of the plank being planed. It serves therefore as a pressure bar to hold the plank while being cut, acting as the pressure rollers, or bars act in the well known Woodworth planing machines.

40 The concavity and convexity of the cutters which are to be used, must be governed by the shape desired to be produced, and they should be counterparts or reverses of the

smallest amount of concavity and convexity required in the plank to be shaped. 45

Before planing and reducing a plank the desired shape must be known and a calculation made as to how far the rollers must be turned or in other words, at what angle they must stand to the line of travel of the plank, 50 in order to produce the required degree of convexity and concavity at different parts of the length of the plank. The plank is then to be laid on the table and shoved through the machine; and while it is being 55 reduced the operator must by means of the hand wheel turn the cutter frame as required. The result will be a plank having one or both sides a warped surface, if both convex and concave cutters are employed; 60 or if two convex and two concave cutters are used. If one convex or one concave cutter is used, either in connection with a resisting surface, or with a straight cutter, then the plank will have a warped surface on one side 65 only.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of concave and convex rotating cutters, or either of them mounted 70 on a frame, free to turn on an axes, with a stationary table or support for the plank to be reduced; the turning frame being provided with proper contrivances for rotating and holding it, and the combination being 75 constructed so as to produce warped surfaces, substantially in the manner described.

In testimony whereof I have hereunto subscribed my name, in the city of Brooklyn, county of Kings, and State of New York, on 80 this twentieth day of March, A. D. one thousand eight hundred and sixty.

JOHN GREEN [L. s.]

Witnesses:

ELISHA B. HIGGINS,
 JOHN C. THOMPSON.