(No Model.)

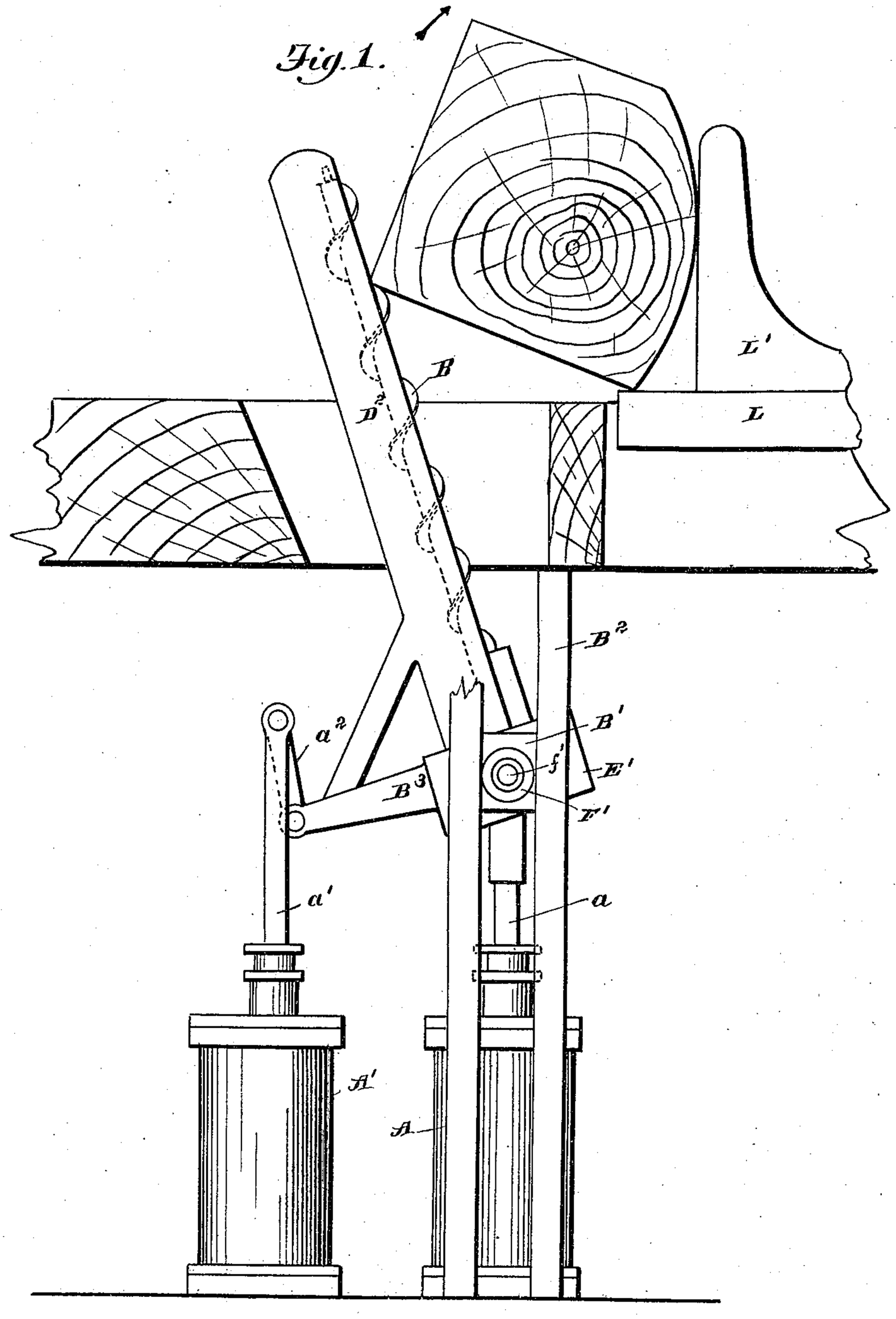
4 Sheets—Sheet 1.

J. EVERED.

STEAM LOG TURNER.

No. 576,565. Patented Feb. 9, 1897.

Fig. 1.



WITNESSES

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4 Sheets—Sheet 2.

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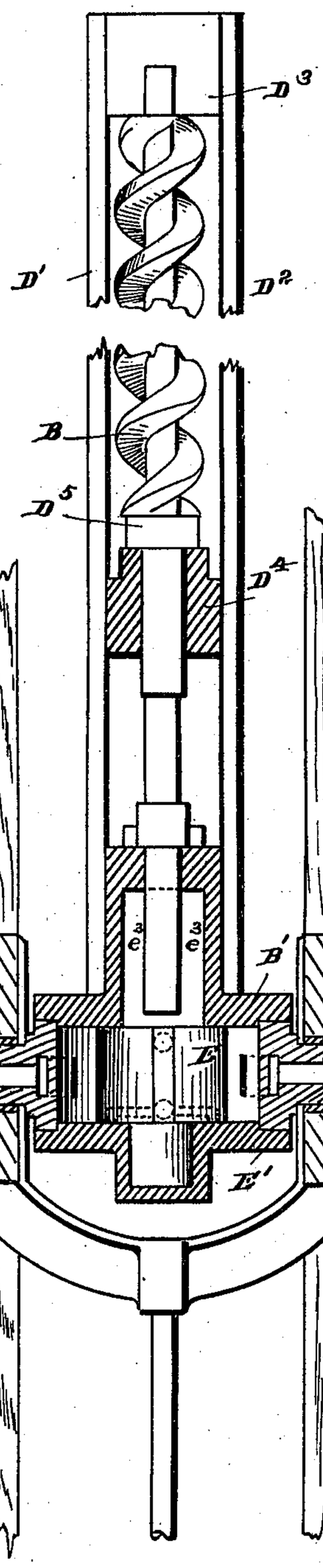
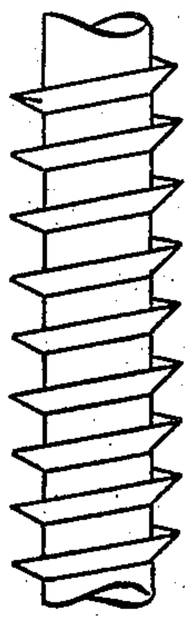


Fig. 2.

Fig. 5.



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4 Sheets—Sheet 3.

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No. 576,565. Patented Feb. 9, 1897.

Fig. 7.

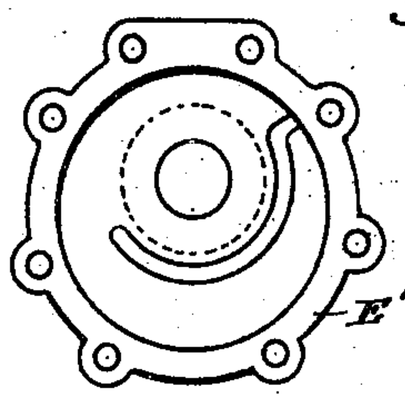

Fig. 6.

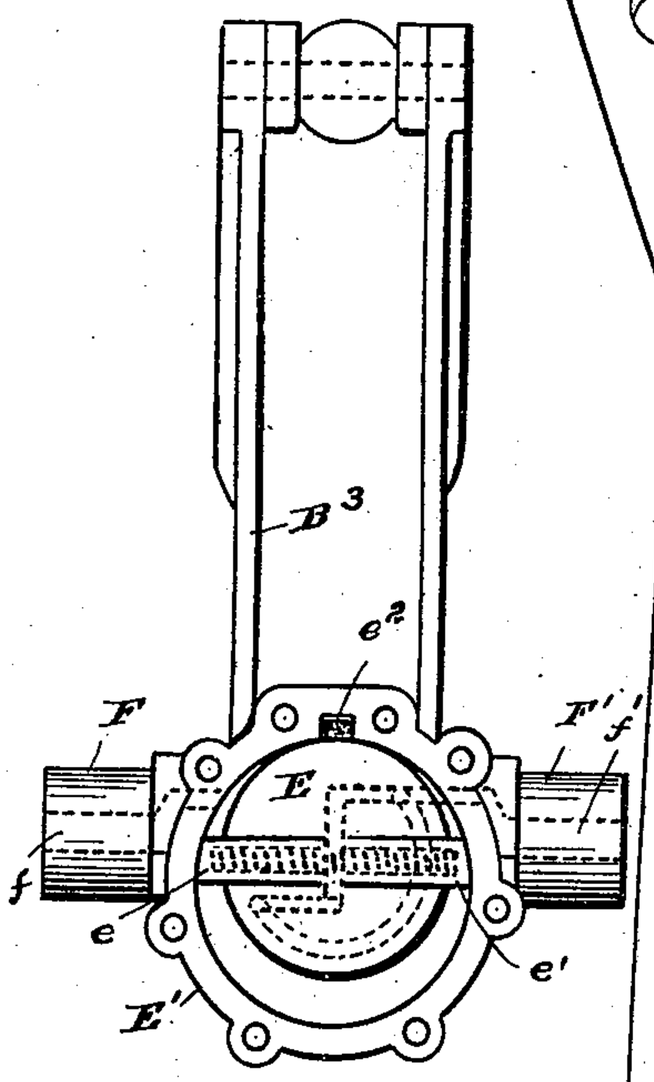

Fig. 3.

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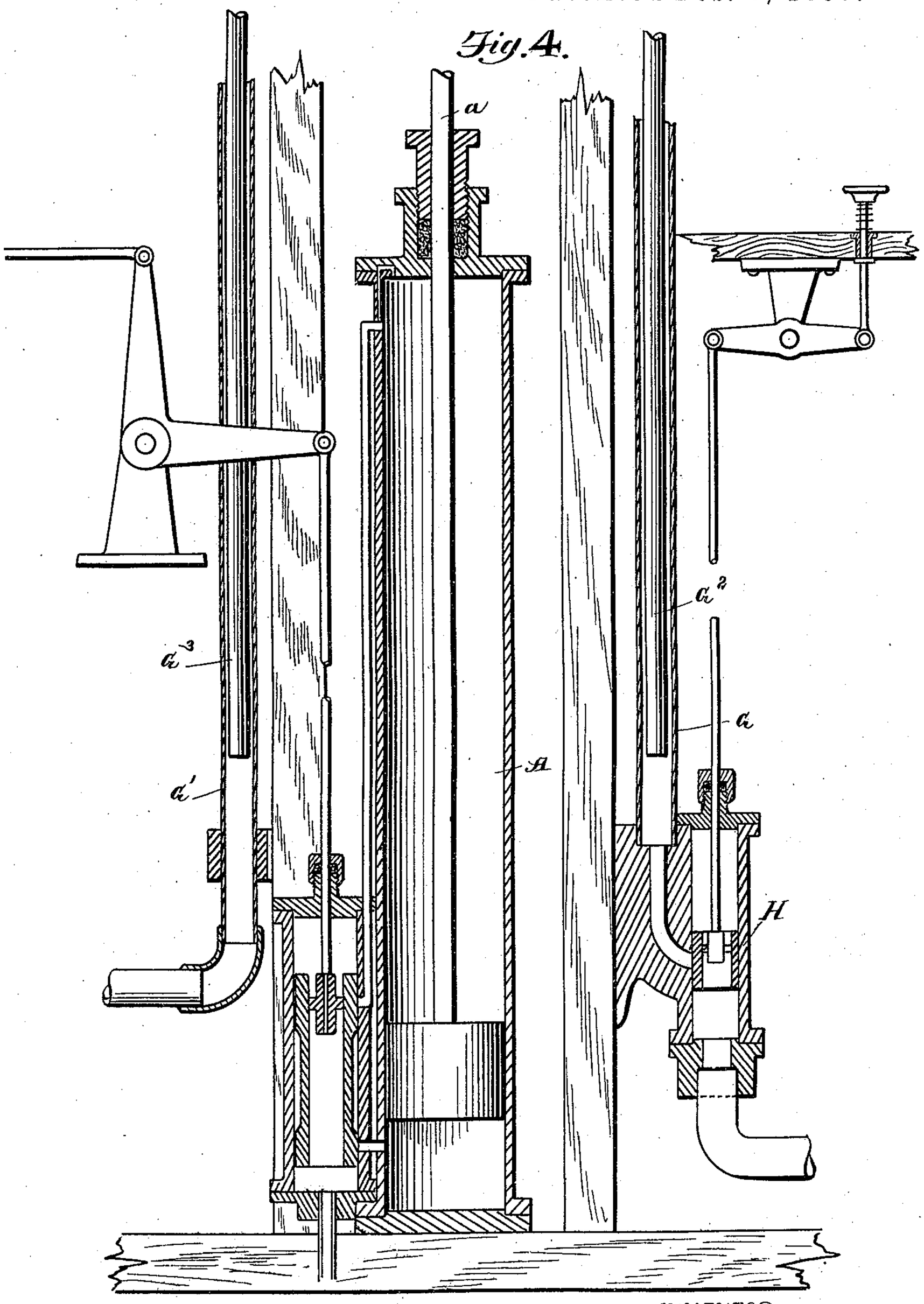
Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOSHUA EVERED, OF DULUTH, MINNESOTA, ASSIGNOR OF TWO-THIRDS TO LOUIS G. LANGE AND ALBERT C. LANGE, OF MUSKEGON, MICHIGAN.

STEAM LOG-TURNER.

SPECIFICATION forming part of Letters Patent No. 576,565, dated February 9, 1897.

Application filed March 26, 1896. Serial No. 584,931. (No model.)

To all whom it may concern:

Be it known that I, JOSHUA EVERED, a citizen of the United States, residing at Duluth, county of St. Louis, State of Minnesota, have invented a certain new and useful Improvement in Steam Log-Turners; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to steam log-turners; and it consists in certain modifications and combinations in such devices, as are hereinafter explained and claimed.

It has for its object the construction of a log-turner which shall be effective and at the same time be incapable of tearing out pieces from a log or cant as it is being turned thereby upon a log-carriage.

Heretofore all log-turners of this class have used teeth which rotate the log by means of their engagement with it. This engagement was effected by forcing the teeth into the log or cant, and the result was, in many instances, that pieces were torn out or off from the corners of cants, thus producing a percentage of waste in clear smooth lumber. I avoid these defects, but secure the same substantial results by the mechanism hereinafter described, in which the distinctive feature consists in using in place of the teeth a rotating endless screw, together with means for controlling and rotating the screw when in contact with the log or cant.

In the drawings, Figure 1 is an elevation of my improved log-turner with the induction-pipe removed. Fig. 2 is a detail figure, partly in section, showing the mechanism by which the rotating tooth-bar is controlled. Fig. 3 is a partial section of Fig. 2 on a plane at right angles to Fig. 2. Fig. 4 is a detail figure, partly in section, of a side elevation of the lower portion of the machine, showing means for controlling the inlet of steam to the rotary engine rotating the tooth-bar. Fig. 5 is a detail figure of a cross-section of the screw tooth-bar, showing the form of a screw-thread to enable it to grasp and hold the log or cant in the operation of turning. Fig. 6 is a detail figure with cap removed, showing the mechanism of the rotary engine. Fig. 7 is a separate plan view of the casing contiguous to the piston.

Similar letters refer to similar parts.

In the drawings, A A′ are the basic driving-cylinders used in operating the tooth-bar. These are of the ordinary construction as used in such devices, and their characteristics do not form any portion of my invention.

B is a bar analogous to the tooth-bar of log-turners and operated and controlled by means of steam-cylinders A and A′ and their connecting-rods a a' in a manner similar to those in common use, the tooth-bar B being pivoted in a cross-head B′, which moves perpendicularly in guides formed in a post B^2, one of which is shown in Fig. 1. Substantially opposite the cross-head is an arm or bracket B^3 of appropriate length, and this is connected to the piston-rod a' or cylinder A′ by means of a link a^2. By this construction steam operating in cylinder A will give a perpendicular movement to the cross-head and bar, while steam operating in the cylinder A′ will tilt the upper end of the bar toward or from the log-carriage within the range of the limits of the movement of its piston and any slot in the log-deck through which it is projected. As heretofore stated, these details are not of the essence of my invention and might be considerably modified without departing from the spirit of my invention. As shown, however, in the drawings hereunto annexed, I construct the bearing which is adapted to engage with the log of substantially three members, two of which, D′ D^2, constitute portions of a framework, within which is journaled and adapted to revolve the screw B. The forward edge of this screw projects beyond the faces of D′ D^2, as shown in Fig. 1.

A uniting member at the top forms the bearing D^3, in which the upper end of the screw revolves. A block D^4 forms a bearing at the lower end, the union of D^3 and D^4 with the side or cheek pieces D′ D^2 forming a frame which carries the strain upon the endless screw B. The shaft of the screw B extends below the journal D^4, and is connected in any appropriate manner to the rotating pis-

ton of a rotary engine, the rotating piston being marked E, a vertical cross-section of which and the inclosing casing appears in Fig. 3. As shown in the drawings, the casing for this rotary engine has trunnions F F′, which trunnions are the pivots of the bar, the plane of the axis of the screw, its shaft, and the piston forming a right angle with the plane of the axis of the trunnions, the casing E′ for the piston being eccentric to the rotating piston, as shown in Fig. 6. This engine is very simple. The rotating piston carries two plungers *e e′* in a transverse slot. These plungers are forced outward by a spiral spring located in a hollow or cavity in each plunger. They are faced to correspond with the interior of the casing E′, and as the piston revolves they form practically steam-tight joints with the interior of the casing by reason of the elasticity of the interposed spiral spring.

The trunnions are hollow, and each is adapted to take steam from a source, as hereinafter described, or to act as an exhaust. The trunnion F at the left hand of the drawings, Fig. 3, has its steam-passage *f* entering the space within the casing E′ behind the plunger *e*. The opposite trunnion F′ has a port *f′* entering the opposite side of the casing in a similar manner, and also behind the companion plunger *e′*. If, therefore, steam be admitted into the trunnion F through the passage *f*, it will cause the piston to revolve by impinging against the plunger *e*. The opposite plunger, passing the port *f′*, allows steam, if any, upon the opposite side of the plunger to pass out through that port until the piston has completed, substantially, a half-revolution, when the steam already admitted, as described, will exhaust and a new supply will be furnished in behind the opposite plunger, and in this manner the piston would rotate indefinitely, so far as steam was concerned, and its direction of motion would be left-handed.

Upon admitting steam to the opposite port F′ a similar effect would take place, but the motion would be right-handed. It is obvious that it is only necessary to furnish steam from a source to either side alternately and controlling the same by suitable valves to enable a reversal of the motion of the piston and consequently of the screw B, to which it is connected by means of the shaft. A suitable packing e^2 may be interposed at the point of contact of the piston with the interior of the casing E. As this rotary engine has a vertical motion in the guides B^2, I have devised means of controlling the steam-supply, which is more particularly shown in Fig. 4.

Upon either side of the cylinder A are rigidly-located tubes G and G′. The upper ends of these tubes have stuffing-boxes *g g′*, through which slide tubes G^2 G^3. The upper ends of these tubes connect by steam-tight connections and stuffing-boxes in a manner well known with the outer ends of the openings in the hollow trunnions F F′. The lower ends of the tubes G and G′ connect with a source of steam-supply and appropriate valves, in which are placed controlling-valves H. It is obvious, however, that flexible tubes might be employed between controlling-valves and the trunnions, but as they are liable to injury I prefer the telescopic tubes described.

The bearing D^4, being rigidly attached to the side pieces of the framework D′ D^2, receives the thrust of any weight brought upon the screw by means of the collar D^5, rigidly attached to the shaft. The shaft of the screw is extended below this bearing and preferably squared and engages in a square hole in an upward extension of the piston E at e^3 e^3. This gives a non-rigid connection between the action of the screw and the piston, and yet one which compels the screw to turn by the movement of the piston. Of course it will be understood that the details of this connection are not the essence of the invention, as the connections could be made in a great variety of forms without departing from its spirit and principle.

The shape of the screw B is shown in Fig. 5. As shown in the drawings, the worm of the screw is double. Its cross-section, as shown in Fig. 5, shows a slight concavity on the upper portion, so as to present a sharp edge to the body to be lifted. The worms are spread to such an extent as to permit the concavity of the log to be pressed in between them or to permit the angularity of the cant to be held by them, as shown in Fig. 1. It is evident that on rapidly rotating the screw in the proper direction any body which is held by the screw would be lifted upwardly on its engaged side, and if held against the knees L′ of a log-carriage L would be rotated or turned in the direction of the arrow in Fig. 1.

What I claim is—

1. In a log-turner, the combination of an upright turning-bar carrying a screw adapted to engage the log to be turned, and said bar being pivoted at its lower end, and means for rotating said screw, substantially as described.

2. In a log-turner, the combination of an oscillating bar carrying a screw adapted to rotate and turn a log, said bar being pivoted at its lower end, means located at its lower end for rotating said screw, an arm projecting rearwardly from its lower end, and means attached to said arm for oscillating said bar, substantially as described.

3. In a steam log-turner, the combination of a bar carrying a vertical screw, a steam-engine adapted to rotate said screw and located at the lower end of said bar, the lower end of said bar being pivoted, guides for controlling its vertical movements, means for admitting steam to said engine carried by said bar, two steam-cylinders adapted to actuate the vertical and oscillating movements of said bar, and means for controlling the admission

of steam to each of the cylinders respectively, substantially as described.

4. In a steam log-turner, a rotating spirally-grooved turning-bar pivoted at its lower end and adapted to have a rectilinear and an oscillatory movement, means to effectuate such movement, a steam-engine at its lower end adapted to rotate said bar, means for the admission of steam to said engine through the pivots supporting said bar, means for controlling the admission of steam thereto, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

JOSHUA EVERED.

Witnesses:

C. T. CRANDALL,

JOHN W. FEE.