

No. 848,225.

PATENTED MAR. 26, 1907.

J. DOULL.  
TIMBER FRAMING MACHINE.  
APPLICATION FILED JAN. 10, 1906.

3 SHEETS—SHEET 1.

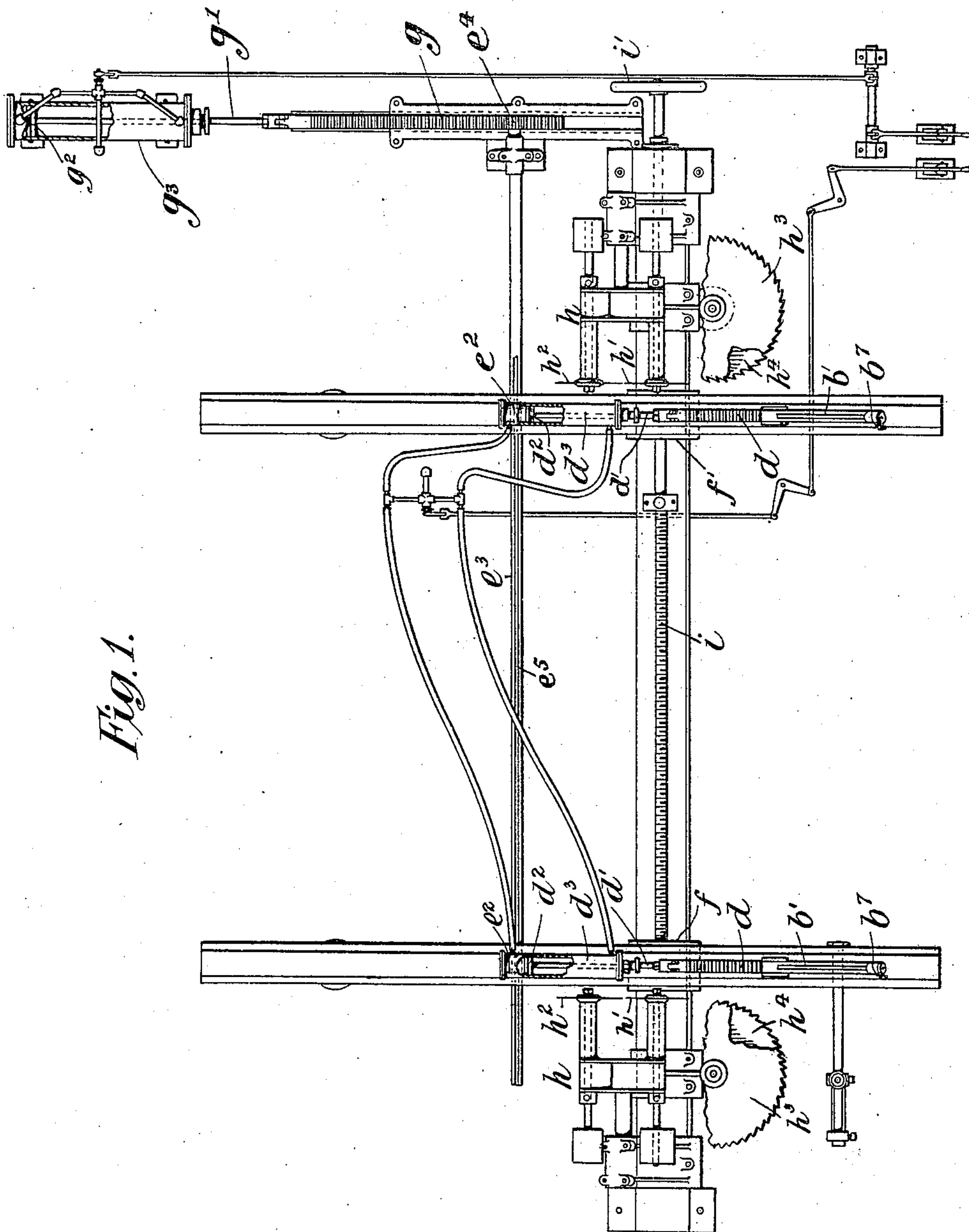


Fig. 1.

Attest:

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Edgeworth Stevens

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3 SHEETS--SHEET 2.

Fig. 2.

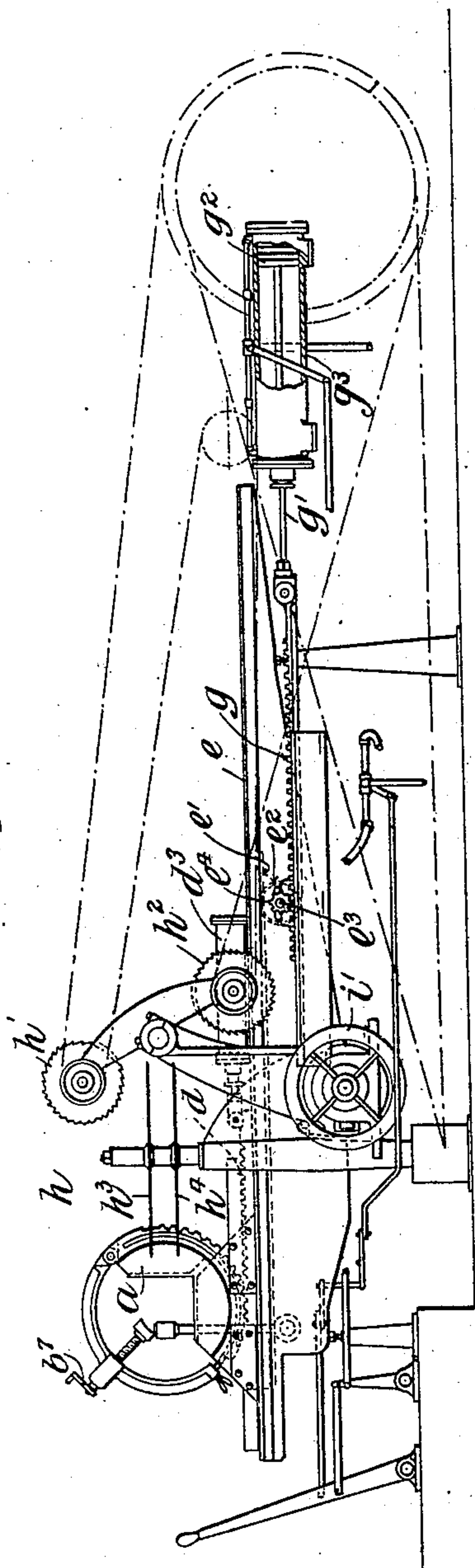
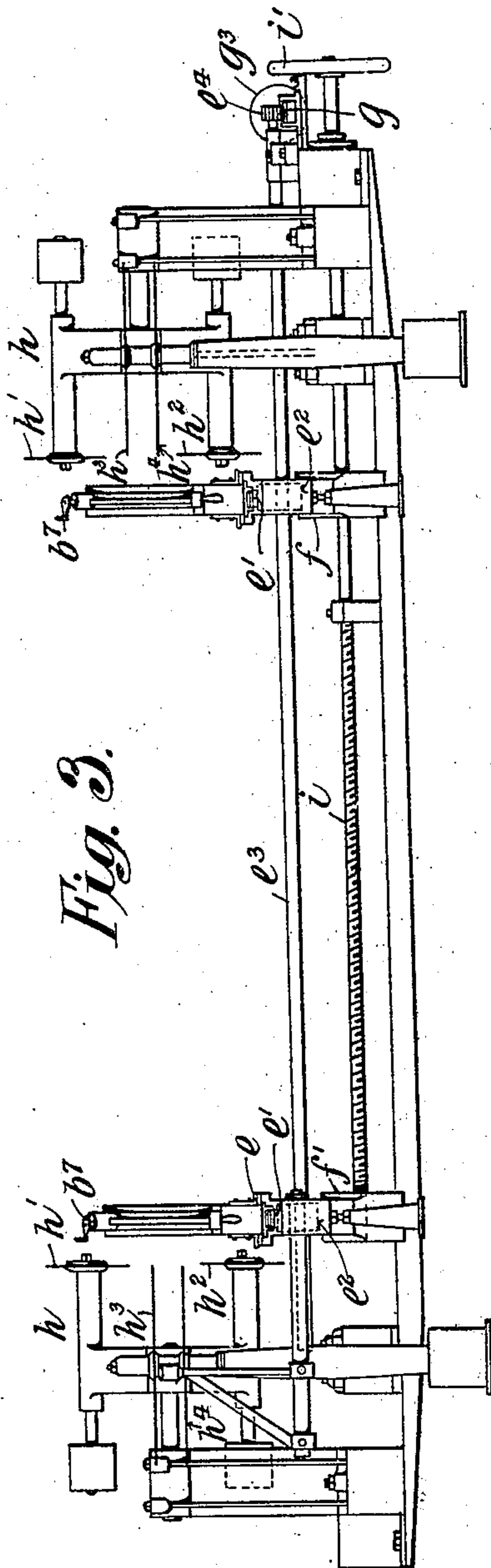


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 5.

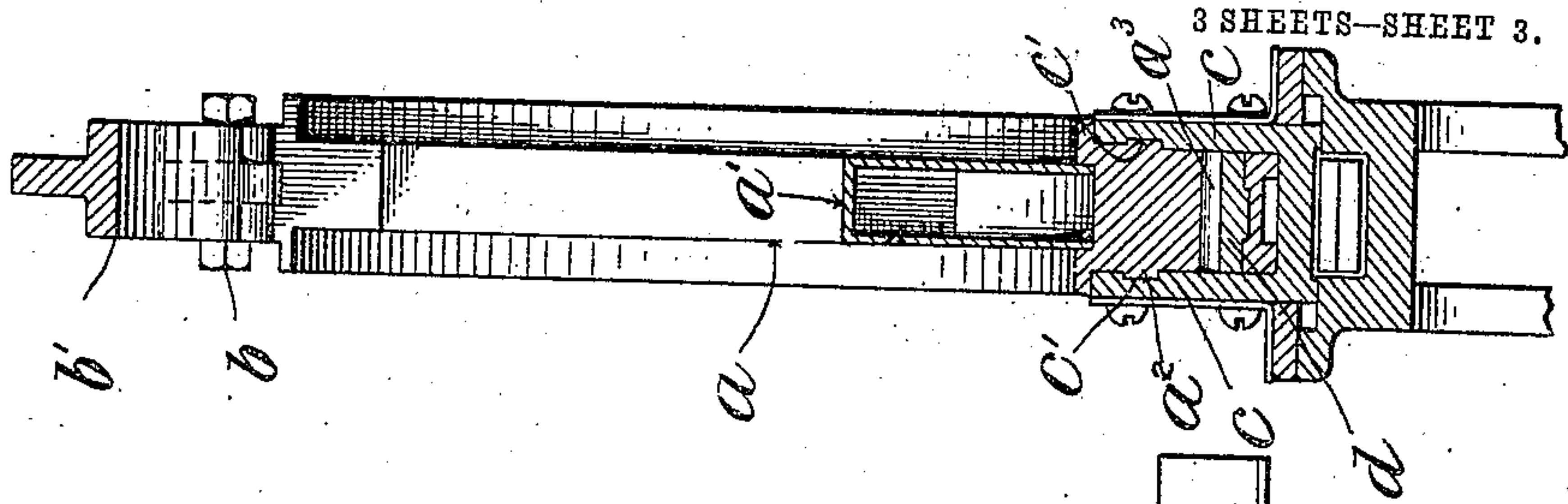
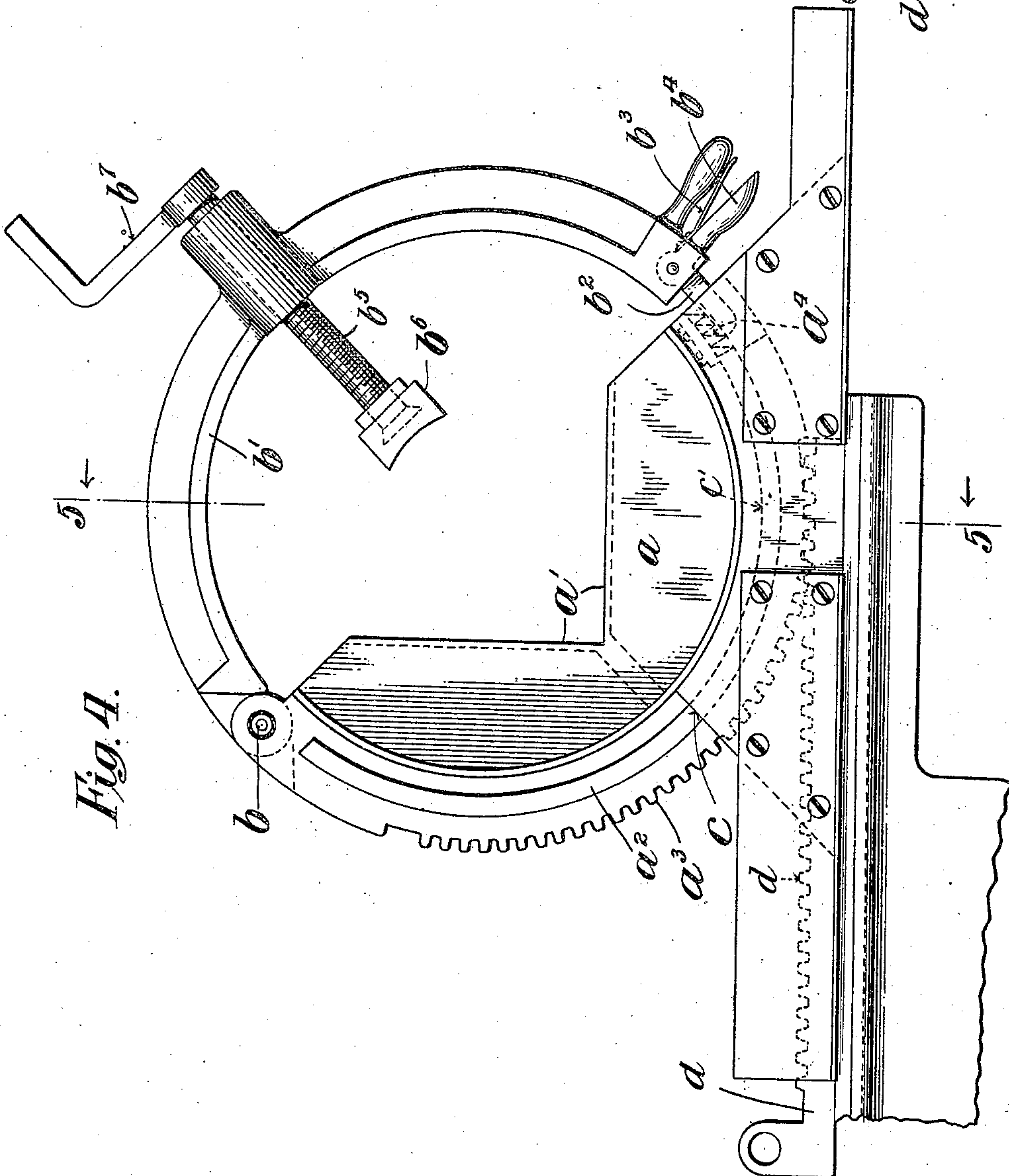


Fig. 4.



Attest:

A. L. Stevens.  
Edgewood Machine

Inventor:

James Doull  
by Redding Kiddle & Greeley  
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# UNITED STATES PATENT OFFICE.

JAMES DOULL, OF BUTTE, MONTANA.

## TIMBER-FRAMING MACHINE.

No. 848,225.

Specification of Letters Patent.

Patented March 26, 1907.

Application filed January 10, 1906. Serial No. 295,348.

*To all whom it may concern:*

Be it known that I, JAMES DOULL, a citizen of the United States, residing in Butte city, in the county of Silverbow, in the State of Montana, have invented certain new and useful Improvements in Timber-Framing Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

10 This invention relates to machines for framing or cutting tenons on the ends of timbers, particularly such timbers, either round or squared, as are commonly used in timbering mines. Such timbers are handled 15 in large quantities, and economy in the preparation thereof is important. Moreover, it is highly desirable that the tenons at opposite ends of a timber shall be alined.

Various machines have been used or designed for doing the work expeditiously and satisfactorily, and in the present case it has been sought, while adhering generally to a known type of machine, to make the machine more automatic in its character, so 25 that less handling of the timbers shall be necessary and so that the work of the machine shall be accomplished more quickly than heretofore. Thus in the present machine mechanical devices are employed for 30 effecting all of the movements of the timbers while in the machine, the mechanism is so arranged and combined as to effect the complete framing of a timber in a single traverse of the timber through the machine to and 35 fro, and the character of the chucks by which the timber is held during the operation upon it is improved. Various other features of improvement will appear as this description proceeds.

40 The machine which has been chosen for illustration herein of the character of the invention is specially adapted, in the formation of its chucks, for the handling of previously-squared timbers; but it will be obvious that 45 chucks for handling round timbers might equally well be employed in the machine and that the various devices shown are capable of use either jointly or separately in machines of other types than the particular one 50 illustrated.

In the drawings, Figure 1 is a plan view of a machine which embodies the improvements, parts being broken away, and various details which are not necessary to a complete 55 understanding of the invention being omitted. Fig. 2 is a view of the machine in side

elevation. Fig. 3 is a view of the machine in front elevation. Fig. 4 is a detail view, on a larger scale, of the chuck. Fig. 5 is a view in section on the plane indicated by the line 5 5 60 of Fig. 4.

The timber to be framed is brought to position in front of the machine by rolls or other suitable means, from which it is transferred directly to the chucks which hold it 65 during the operations upon it. In the machine illustrated in the drawings the chucks, of which there are two, are formed with particular reference to the handling of timber which has been squared previously. Each 70 chuck is adapted to have a one-quarter rotation and comprises a semicircular holder *a*, having a rectangular seat *a'* to receive the timber, provided near its periphery, on each side, with a curved rib *a<sup>2</sup>* and on its periphery 75 with a segmental rack *a<sup>3</sup>*. Hinged to the holder *a* at one end thereof, as at *b*, is a clamping-jaw *b'*, which at its opposite end is provided with a spring dog or catch *b<sup>2</sup>*, adapted to engage a toothed recess *a<sup>4</sup>* in the other end 80 of the holder *a*, the dog or catch *b<sup>2</sup>* being provided with a spring *b<sup>3</sup>* and an operating-handle *b<sup>4</sup>*.

The clamping-jaw is preferably semicircular in form and is provided centrally with a 85 radial clamping-screw *b<sup>5</sup>*, having a loosely-mounted head *b<sup>6</sup>* and an operating-handle *b<sup>7</sup>*. The clamping-jaws *b'* being thrown back, the timber is rolled upon the holders *a*, and the clamping-jaws are then thrown forward, the 90 dog *b<sup>2</sup>* engaging the toothed recess *a<sup>4</sup>*. The screw-clamp *b<sup>5</sup>* is then turned forward to hold the timber firmly in position. The chuck or holder *a* is mounted to rotate in a chuck-frame *c*, the cheek-pieces of which are grooved 95 internally, as at *c'*, to engage the curved ribs *a<sup>2</sup>* of the chuck or holder, so that the chuck is capable of rotation about the center of the segmental gear *a<sup>3</sup>*, while it is held from rolling motion. The segmental gear *a<sup>3</sup>* is engaged 100 by a straight sliding rack *d*, which is mounted to slide in the frame *c* and is connected to the rod *d'* of a piston *d<sup>2</sup>*, adapted to be moved in a cylinder *d<sup>3</sup>*, supplied, preferably, with air 105 under pressure from any suitable source and controlled by valves, not necessary to be shown herein. The cylinder *d<sup>3</sup>*, rack *d*, and frame *c* are mounted upon a carriage *e*, supported at one side of the machine in suitable 110 ways *f* and at the other side of the machine in corresponding ways *f'*. Each carriage *e* is provided with a rack *e'*, engaged by a cor-



responding pinion  $e^2$  on a shaft  $e^3$ . The latter also carries a pinion  $e^4$ , which is engaged by a rack  $g$ , connected to the rod  $g'$  of a piston  $g^2$  in a cylinder  $g^3$ . The latter is supplied, preferably, with air under pressure from any suitable source and is provided with valves by which it can be controlled.

At each end of the machine is placed a framing-head  $h$ , comprising upper and lower vertical saws  $h^1$  and  $h^2$ , and upper and lower horizontal saws  $h^3$  and  $h^4$ . These saws are driven by suitable means, and as the construction of such framing-heads is substantially the same as heretofore further description thereof herein is unnecessary.

In order that timbers of different lengths can be handled in the machine, it is necessary that one of the framing-heads and the adjacent chuck, with its associated parts, be movable toward and from the corresponding parts at the other end of the machine. Accordingly the framing-head  $h$  at the left-hand end of the machine, as shown in Figs. 1 and 3, and the corresponding ways  $f'$  are mounted so as to be movable together upon the bed-plate of the machine, and a screw  $i$ , provided with a hand-wheel  $i'$  at one end of the machine and mounted in suitable bearings, engages the ways  $f'$  and through its rotation causes the ways  $f'$  and corresponding head and associated parts to be moved toward or from the other head, according to the length of the timber to be cut. The shaft  $e^3$  is grooved longitudinally, as at  $e^5$ , to engage a key in the left-hand pinion  $e^2$ , so as to permit the necessary lateral movement, while providing for the rotation of the pinion in whatever position the carriage may then be placed.

In the operation of the machine the timber to be framed is secured in the chucks, as already described. The air or other fluid under pressure is then turned on in the cylinder thereby throwing the piston forward and through the rack  $g$ , pinion  $e^3$ , shaft  $e^4$ , pinions  $e^2$ , and racks  $e'$  moving the carriages on which the chucks are mounted forward and carrying the timber through the saws in the forward direction. As soon as this movement is completed the air is turned on in the cylinder  $d^3$ , and the pistons therein being thrown forward, together with the racks  $d$ , the chucks are rotated through a one-quarter turn. Air is now admitted to the cylinder  $g^3$  on the opposite face of the piston therein, and the timber is thereby moved again toward the front of the machine, and as it passes through the framing-heads the framing of the ends is completed. As the movement of the carriage ceases air is admitted to the cylinder  $d^3$  in front of the pistons, and thereby the chucks are rotated backward a one-quarter turn, placing them in position for the release and discharge of the timber just framed and for the reception of another

timber. The framing of each timber is therefore completed in a single traverse of the timber through the machine to and fro, and all of the operations, including the turning of the timber and except the mere placing and securing of the timber in the chucks, are performed by mechanisms which act rapidly and powerfully. The productiveness of the machine is therefore greatly increased as compared with other machines now in use, and at the same time the expense of maintenance and operation is greatly reduced, as all of the operations of the machine can be placed under the control of one man through suitable location of the controlling-valves.

I claim as my invention—

1. In a timber-framing machine, the combination of a framing-head, a timber-supporting carriage, a guideway fixed with relation to the framing-head and upon which said carriage is free to travel, a rack on the under side of said carriage, a shaft mounted on said guideway and having a gear to engage said rack and another gear, a stationary power-cylinder, a rack actuated by the piston of said cylinder and engaging the last-named gear on the shaft, a timber-chuck mounted rotatably on said carriage and provided with a rack, a power-cylinder mounted on said carriage and a rack actuated by the piston of said power-cylinder and engaging the rack on the timber-chuck.

2. In a timber-framing machine, the combination of two framing-heads adapted to act simultaneously upon the ends of a timber, timber-supporting carriages, guideways fixed with relation to said heads and upon which said carriages are free to travel, racks on the under sides of said carriages, a shaft mounted on said guideways and having gears to engage said racks and a third gear, one of the first-named gears being slidable on the shaft, a stationary power-cylinder, a rack actuated by the piston of said cylinder and engaging the third gear on the shaft, timber-chucks mounted rotatably on said carriages and provided with racks, power-cylinders mounted on said carriages, racks actuated by the pistons of said power-cylinders and engaging the racks on the timber-chucks, one of said guideways with the corresponding carriage-chuck and framing-head being movable toward and from the other, and means to shift said guideway, with its associated parts, toward and from the other guideway and its associated parts.

3. In a timber-framing machine, the combination of a framing-head, a guideway, a carriage mounted on said guideway, means to reciprocate said carriage, and a timber-chuck mounted rotatably on said carriage, said chuck comprising a segmental holder having a seat for the timber, a clamping-jaw hinged to the holder at one end and adapted to engage the holder at the other end, and a



radial clamping-screw carried centrally by said jaw.

4. In a timber-framing machine, the combination of a framing-head, a guideway, a carriage mounted on said guideway, means to reciprocate said carriage, a chuck-frame mounted on the carriage, a rack sliding in said frame, a segmental holder mounted rotatably in said frame and having a gear engaged by said rack, a clamping-jaw hinged to

the holder at one end and adapted to engage the holder at the other end and a radial clamping-screw carried centrally by said jaw.

This specification signed and witnessed this 12th day of December, A. D. 1905.

JAMES DOULL.

In presence of—

H. C. HOPKINS,

L. C. RITER.