

No. 623,002.

E. E. FITZGERALD.
LOG CANTER.

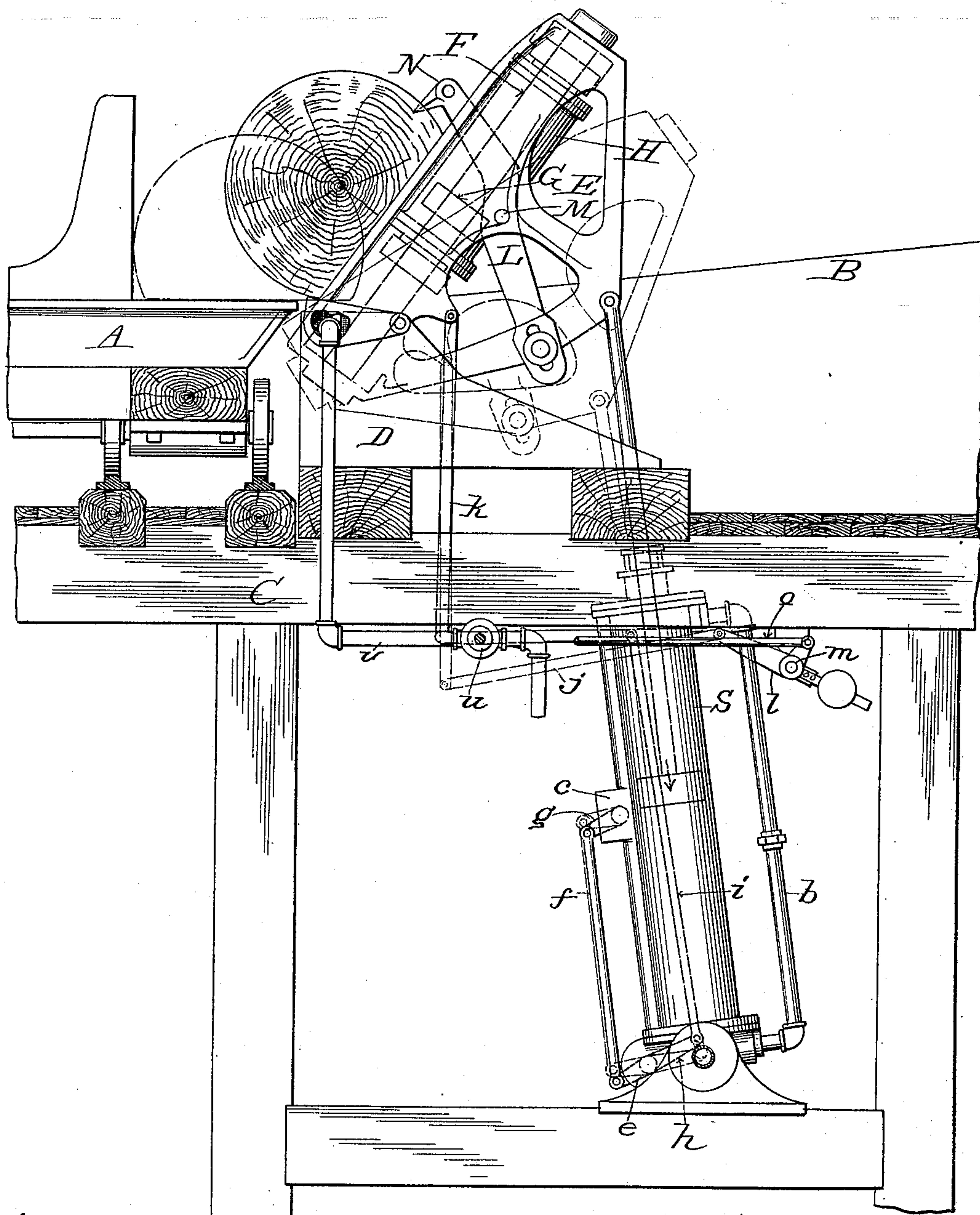
Patented Apr. 11, 1899.

(Application filed May 24, 1897.)

(No Model.)

5 Sheets—Sheet 1.

Fig. 1.



ATTEST;
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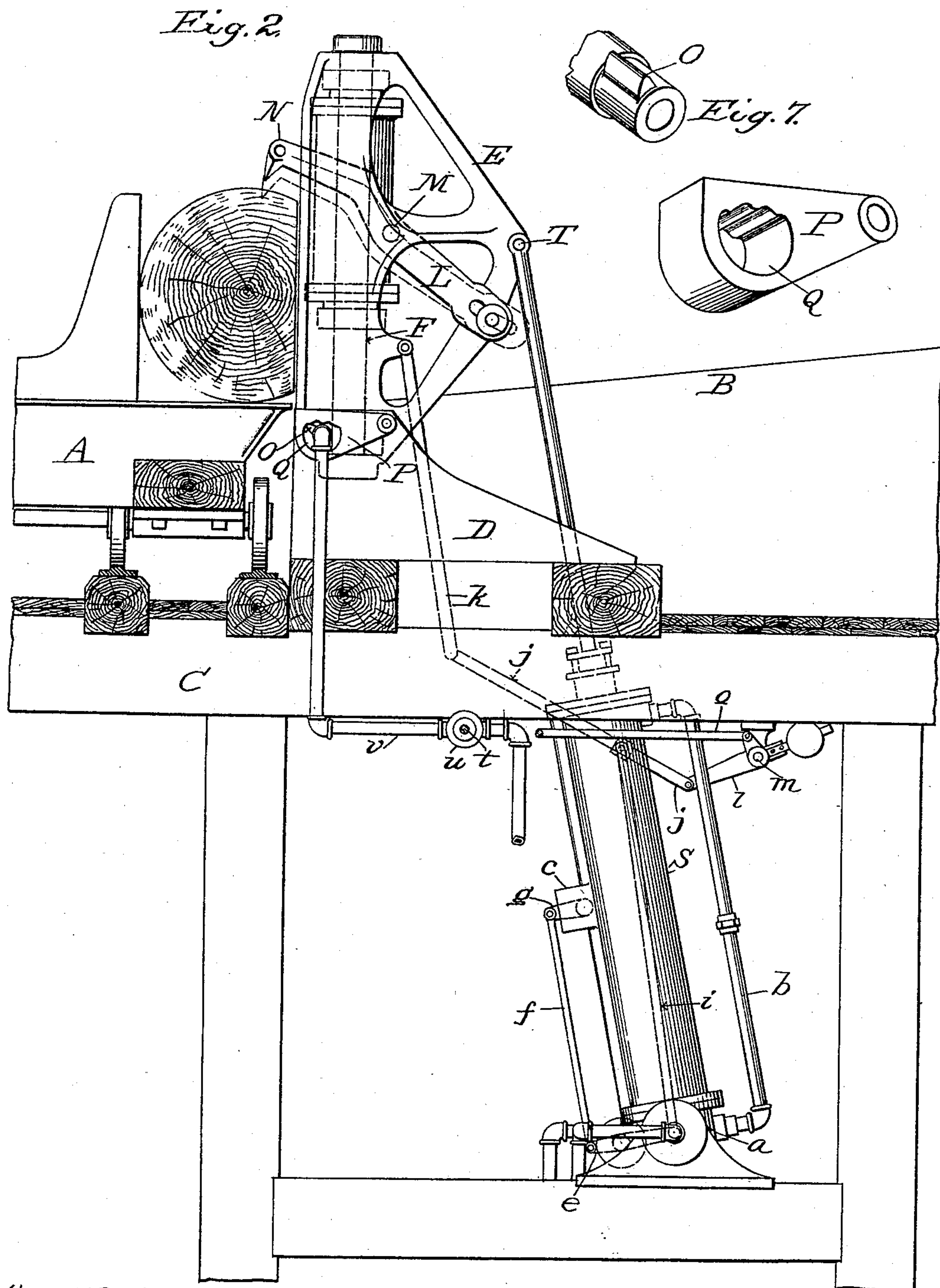
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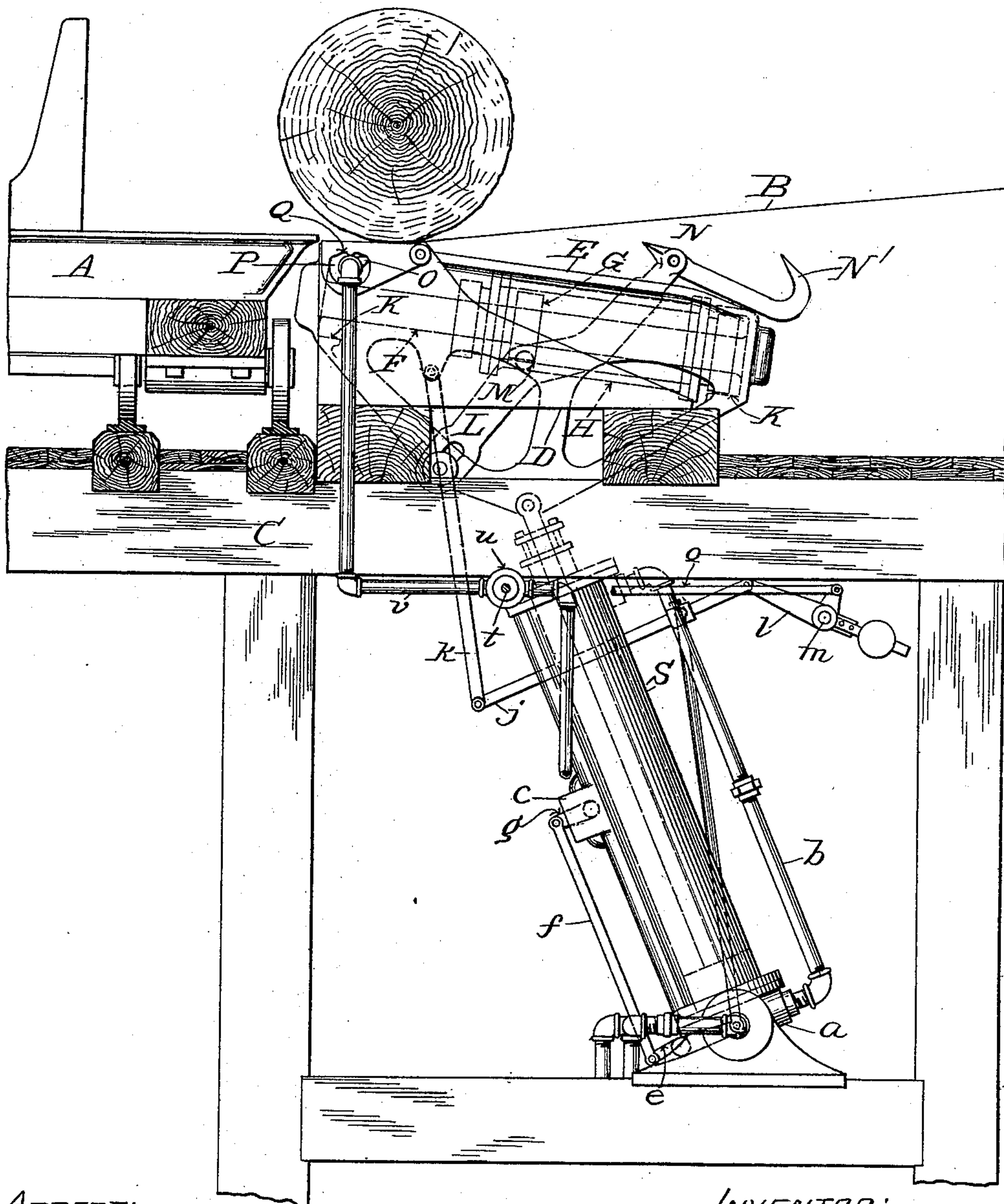
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Fig. 3.



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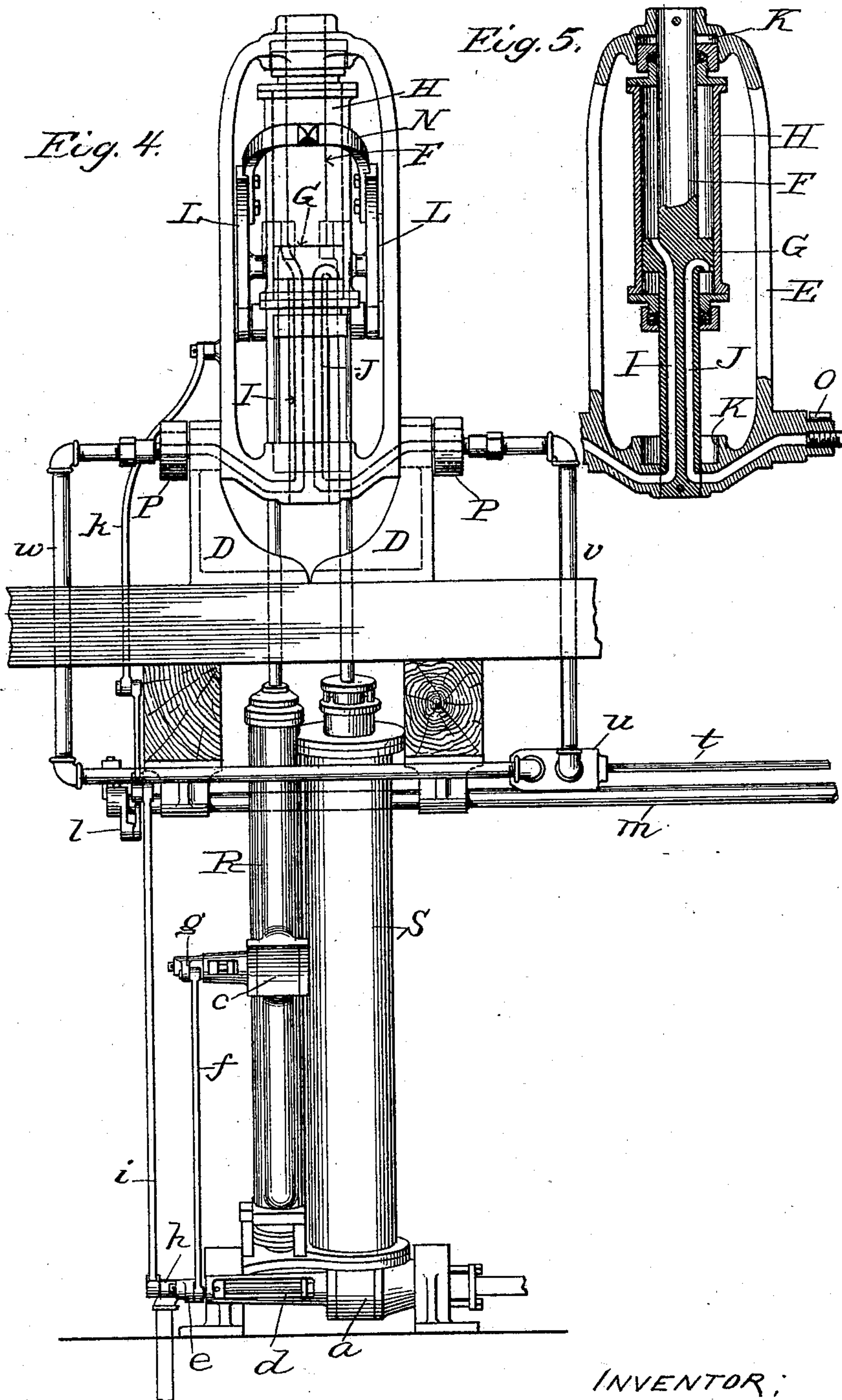
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ATTEST;
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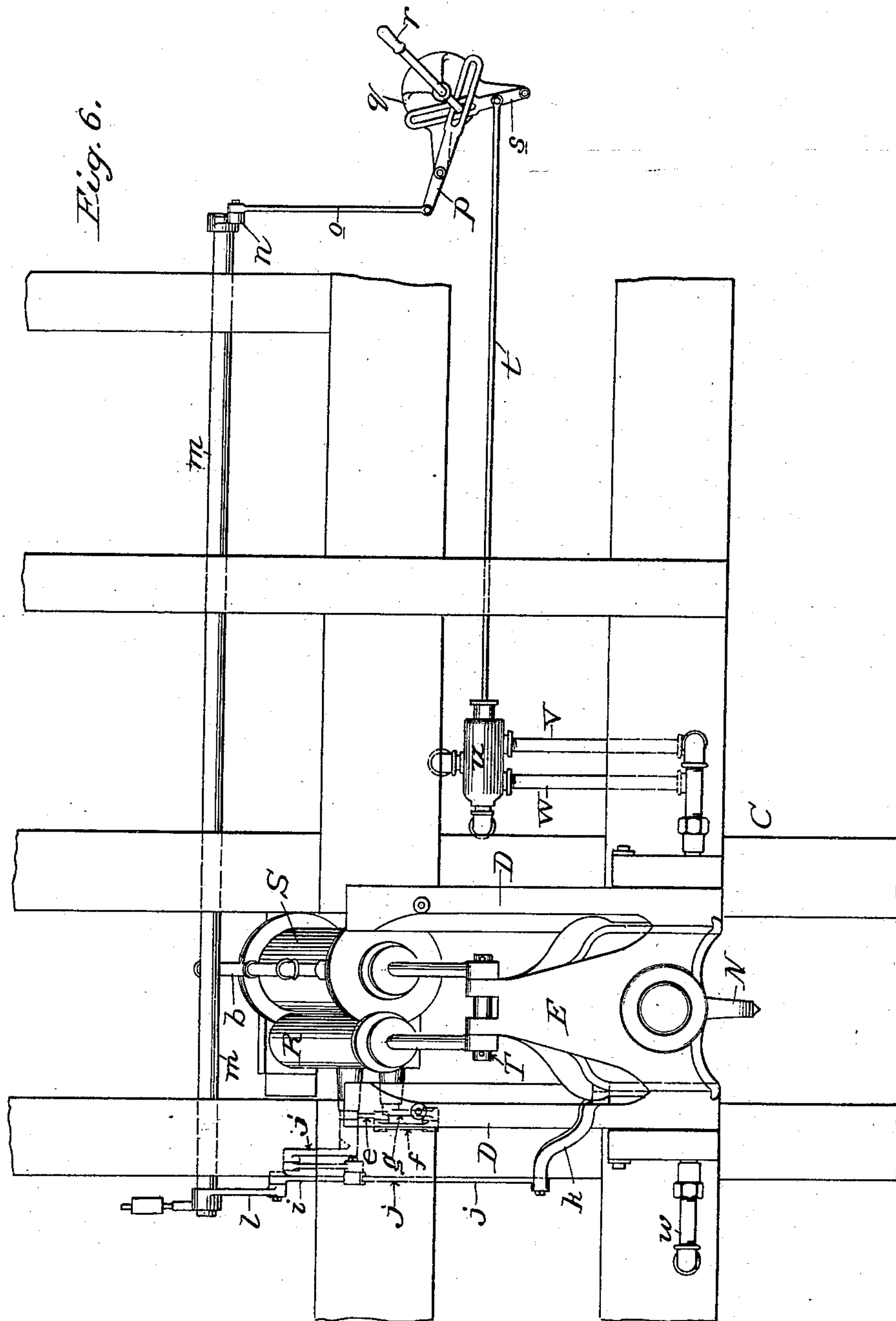
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(No Model.)

5 Sheets—Sheet 5.



Attest
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UNITED STATES PATENT OFFICE.

EDWARD EUGENE FITZGERALD, OF MILWAUKEE, WISCONSIN, ASSIGNOR
OF ONE-HALF TO THE EDWARD P. ALLIS COMPANY, OF SAME PLACE.

LOG-CANTER.

SPECIFICATION forming part of Letters Patent No. 623,002, dated April 11, 1899.

Application filed May 24, 1897. Serial No. 637,927. (No model.)

To all whom it may concern:

Be it known that I, EDWARD EUGENE FITZGERALD, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Log-Canters, of which the following is a specification.

My present invention relates to log-canters, the operation and advantages of which will be hereinafter set forth, reference being had to the annexed drawings, wherein—

Figures 1, 2, and 3 are side elevations of the canter, shown in its proper relation to the log deck and carriage, the parts being in different working positions in the various views; Fig. 4, a front elevation; Fig. 5, an enlarged sectional view showing certain details of construction; Fig. 6, a top plan view, and Fig. 7 an enlarged perspective view illustrative of certain details.

One object of my invention, among others, is to produce a canter by which the log is turned away from the knees in the act of turning.

A further advantage resides in the fact that by the construction employed the log as it balances over or turns over falls upon the canter-frame, which, being steam-actuated, forms, as it were, a steam-cushion for the log. By this arrangement the log does not fall upon the carriage or upon the log-deck, as is usual.

Another advantage is present in the fact that the same movement which operates the hook also turns the log, thereby saving time over those constructions wherein the log is first removed from the carriage and then turned.

Other advantages are also present and will appear in the following description.

Referring to Figs. 1, 2, and 3, A denotes the carriage, and B the log deck or way, supported upon suitable framing C. At and below the end of the log-deck adjacent to the carriage is secured a frame D, in which is journaled a frame E in a manner to be presently explained.

Frame E has mounted within it a piston-rod F, formed with a piston G, and a cylinder H is mounted upon and works upon said

rod, steam-inlets I and J extending through the rod and communicating, respectively, with the upper and lower spaces above the piston. The trunnions of frame E, working in frame D, are hollow, and the passages thus formed connect the passages I and J with suitable steam-pipes, which are connected to the trunnions by packed swiveled couplings.

Upon reference to Fig. 5 it will be noted that the upper and lower ends of frame E are provided with annular recesses K, which, in conjunction with the packing-nuts on the heads of the cylinder, form air-cushions for the cylinder at the end of its stroke as it moves up or down.

The frame E extends rearwardly, and at a point below its center there is pivoted to it at each side an arm L, which arms extend upward in a forward direction and are journaled upon the cylinder at M. To the ends of said arms is bolted or otherwise securely fastened a hook N, which extends out over the log on the carriage when the parts are in the position indicated in Fig. 2. The rear ends of arms L are slotted, as shown, so that the point of the hook as the cylinder descends may be drawn in toward the front face of frame E.

When operating upon logs of large diameter, it may sometimes be necessary to employ a hook of longer reach or throw, and to this end there is pivoted to the end hook N a supplemental hook N', as shown in Fig. 1 of the drawings. When not in use, this hook may be removed or thrown back out of the way.

The trunnions of frame E, as will be seen upon reference to Figs. 5 and 7, are formed with lugs or projections O. To each side of frame D are pivoted blocks P of the form shown in Figs. 1, 2, 3, and 7. These blocks are formed with a flat upper face and with a transverse opening Q, the upper side of which is cam-shaped, as shown. The lugs O of the trunnions work against these cam-surfaces as the frame E is turned upon its bearings and the blocks are raised and lowered, forming a support for the lower face or side of the log when it is being withdrawn from the carriage by the hook to be turned. The blocks are so pivoted to the supporting-frame D that they normally are below the log-deck and do not interfere with the pas-

sage of the logs from the deck to the carriage. (See Fig. 3.)

Beneath the log-deck and in line with the frame E are pivoted two cylinders, an oil-cylinder R and a steam-cylinder S, the cylinders being connected and pivoted in the same frame or base, as shown in Fig. 4. The piston-rods of these cylinders are connected to the frame E at its rear by a pin T, so that both piston-rods must move in unison.

At the base of the steam-cylinder there is provided a valve *a* to control the inlet of steam to said piston, the steam passing directly from the valve into the lower part beneath the piston and through a pipe *b* from the valve to the upper part of the piston, according as the valve is open to one or the other of said inlets. The oil-cylinder is provided midway of its length with a valve *c* to permit the oil to pass from one end of the cylinder to the other, and thus allow the piston to move or to stop the flow of the oil, and thus stop the piston in its travel.

The stem *d* of the steam-valve *a* is connected through a rocker-arm *e*, link *f*, and rocker-arm *g* to the oil-valve *c*, the valves being arranged to open and close in unison.

To the outer end of valve-stem *d* there is secured another rocker-arm *h*, which is connected by link *i* to rod *j*, said rod *j* being in turn connected at its forward end to a rod *k*, pivotally connected to frame E. Rod *j* at its rear end is connected to an arm *l*, secured upon a counterweighted cross-shaft *m*, secured beneath the framing C. Cross-shaft *m* at its opposite end is connected through arm *n* and link *o* to a slotted arm *p*, pivoted upon a stand *q*. A hand-lever *r* is mounted in said stand and in such manner that it has a universal movement, the lower end of the lever passing through the slot in arm *p* and into a slot formed in an arm *s*, also pivoted upon the stand *q*. Extending from said arm *s* is a rod *t*, which controls the valve *u*, admitting steam to the upper cylinder H through pipes *v* and *w*.

It will be noted upon reference to Fig. 6 that the arms *p* and *s* stand at approximately right angles to each other, so that by a right line movement of the lever either one of the arms may be moved without affecting the other, while if the lever be turned in a circular path both arms may be moved simultaneously and the machine caused to go through one complete operation. In other words, by moving the lever in a plane through the slot of one arm it will serve to operate the other arm *p* or *s*, as the case may be, or by moving the lever coincident with the surface of a cone, thus crossing the planes through both slots of the arms *p* and *s*, both arms will be moved simultaneously.

Assuming the parts to be in the position indicated in Fig. 3, in which relation steam is shut off both from the lower and upper pistons, the valve *c* of the oil-cylinder is closed so that no oil can pass therethrough. A log

is then rolled down the logway onto the carriage and a cut or any desired number of cuts are made. After this the operator by movement of the hand-lever *r* moves arm *p* and through the connections above set forth admits steam to cylinder S below the piston. The valve in the oil-cylinder is also opened to the same degree as the steam-valve, and frame E is forced upward into the position indicated in Fig. 2. If the lever *r* be moved in a right line only, the lower cylinder alone will be affected and the frame will be raised quickly or slowly, according to the extent to which the valves are opened. When the frame reaches its vertical position, the steam will be automatically cut off through the connections *i*, *j*, *k*, and *l* with shaft *m*, but not until the parts have passed from the position indicated in Fig. 3 to that indicated in Fig. 2. While the frame is moving into the vertical, the operator by a further movement of the lever in a line, so as to act upon arm *s*, admits steam into cylinder H, causing the hook to descend and enter the log, when by a further movement of lever *r* in a circular path steam will be admitted in the upper end of cylinder S and the frame drawn down. In turning, lugs O, acting upon block P, will throw said blocks upwardly into the position denoted in Fig. 1, thereby forming a support for the lower side of the log. As the log is turned away from the carriage and knees it rests bodily against the frame and upon the block and the descent of the frame and cylinder is regulated or checked by the oil in the oil-cylinder. When the frame reaches the position indicated in dotted lines in Fig. 1, the blocks P are withdrawn from beneath the log and the hook, acting on the upper part of the log, forces it over onto the carriage, the packing-nut on the lower end of the cylinder H entering the annular chamber K and checking the cylinder in its downward movement. So soon as the log is in its place upon the carriage steam is admitted above piston G, thus elevating cylinder H and hook N into position to again operate upon the log.

Through the connections of the valves and the controlling-lever, as above set forth, the movements of the machine are in a sense independent of the movement of the lever after the machine has once been started—that is to say, the frame will move entirely up or down unless arrested and then automatically come to a stop, the valve being what is known as a “floating” valve.

If it be desired to move the frame quickly, all that is necessary is to give the lever a full throw, opening the steam-valves to their full extent and also opening the oil-check valve to a like degree, thereby permitting the steam to act with its full force and effect. Ordinarily, however, steam is admitted gradually, and the piston in the lower cylinder can move only as fast as the oil in the oil-cylinder can pass from one side to the other, and when the machine comes to a stop the steam is pre-

vented from working expansively by the oil-check.

As before stated, one complete revolution of the controlling-lever will cause the frame to ascend to the vertical, the hook to engage the log, the frame to swing back, carrying the log with it, the log to be turned and placed flat face down upon the carriage, and finally the hook to ascend ready to again engage the log.

By shifting the pivotal connection of link *i* along the link *j* the point at which the valves will close can be regulated as desired.

When the log is first rolled upon the carriage and the frame is in a horizontal position, the log may, if necessary, be crowded up against the knee by simply admitting steam above piston G, causing the hook to press the log forward, thereby answering the purposes of a log-loader.

Having thus described my invention, what I claim is—

1. In a log-canter, the combination of a working cylinder and its piston and piston-rod; an oil-check cylinder and its piston and piston-rod; a canter-frame; and a common connection between said frame, and the piston-rods.

2. In a log-canter, the combination of a working cylinder, and its piston and piston-rod; an oil-check cylinder, and its piston and piston-rod; a canter-frame; a common point of connection between said frame and the piston-rods; valves for said pistons; and means for moving said valves in unison.

3. In a log-canter, the combination of a working cylinder, and its piston and piston-rod; an oil-check cylinder, and its piston and piston-rod; a canter-frame; a common point of connection between said frame and the piston-rods; valves for said pistons; connections between said valves to move them in unison; and connections between said valve connections and the canter-frame.

4. In a log-canter, the combination of a pivoted canter-frame; a hook carried thereby; means for operating said hook also carried by the frame; a power-cylinder for actuating the canter-frame; and means for admitting steam to said cylinder and to the hook-actuating mechanism, said means being so arranged that parts may be actuated simultaneously or independently.

5. In a log-canter, the combination of a pivoted canter-frame; a piston carried thereby; a hook adapted to be actuated by said piston; a power-cylinder for actuating the canter-frame; and means for controlling the actuation of the pistons independently or simultaneously.

6. In a log-canter, the combination of a pivoted canter-frame; a cylinder carried thereby; a hook adapted to be actuated thereby; a power-cylinder for actuating the canter-frame; and means for actuating the cylinders.

7. In a log-canter, the combination of a pivoted canter-frame; means for raising and low-

ering it; a hook pivoted to the frame; and a power-cylinder carried by the frame for actuating the hook.

8. In a log-canter, the combination of a pivoted canter-frame; means for raising and lowering it; a hook pivoted to the frame; a power-cylinder carried by the frame for actuating the hook; and air-chambers formed in the frame for receiving the cylinder at the ends of its stroke.

9. In a log-canter, the combination of a pivoted canter-frame; a hook provided with a slotted rear end; a pivot-pin extending from the frame through said slot; and means carried by the frame and moving in a line approximately parallel to the face thereof for raising and lowering the hook, substantially as described.

10. In a log-canter, the combination of a pivoted canter-frame; a hook provided with a slot at or near its rear end; a pivot-pin extending from the frame through said slot; means carried by the frame and moving in a line approximately parallel to the face thereof for raising and lowering the hook; and a supplemental or extension hook pivoted to the outer end of the pivoted hook, substantially as and for the purpose described.

11. In a log-canter, the combination of a pivoted canter-frame; a piston-rod provided with a piston secured within said frame; a cylinder mounted upon and designed to be traversed back and forth upon the rod; and a hook pivoted to the frame and connected to the cylinder.

12. In a log-canter, the combination of a pivoted canter-frame; a piston-rod provided with a piston mounted therein; a cylinder mounted upon and designed to be traversed upon said rod; a hook pivoted to the frame and connected to the cylinder, and steam-inlets extending through the rod and discharging respectively above and below the piston.

13. In a log-canter, the combination of a pivoted canter-frame provided with extended trunnions; lugs upon said trunnions; and blocks pivoted upon the frame-support in rear of the trunnions, provided with cam-shaped recesses designed to fit over the trunnions and lugs and to act in conjunction therewith, to elevate the forward ends of the blocks and project them beyond the face of the frame as it swings back substantially as and for the purpose described.

14. In a log-canter, the combination of a pivoted canter-frame; blocks pivoted to the frame-support; and means for elevating the forward ends of the blocks and projecting them beyond the face of the canter-frame to afford a bearing for the lower side of the log as the frame swings back.

15. In a log-canter, the combination of a pivoted canter-frame carrying a hook; blocks pivoted to the frame-support; and means carried by the frame for elevating the forward ends of the blocks and projecting them be-

yond the face of the frame to afford a bearing for the lower side of the log as the frame swings back.

16. In a log-canter, the combination of a pivoted canter-frame; blocks pivoted to the frame-support; and means controllable by the movement of the canter-frame for raising the forward ends of the blocks and projecting the same beyond the face of the frame as the frame begins to swing back and to lower the blocks into alinement with the face of the frame when the frame reaches that position where the log is to be discharged therefrom.

17. In a log-canter, the combination of a pivoted canter-frame provided with extended trunnions having arms or lugs O formed thereon; blocks P pivoted to the frame-support in rear of said trunnions and provided with cam-shaped recesses Q designed to fit over the lugs O, said lugs and cam-shaped recesses being so adapted and arranged as to elevate the forward ends of the blocks and to project the same beyond the face of the canter-frame during the first portion of its rearward movement; and means for raising and lowering the canter-frame.

18. In a log-canter, the combination of a pivoted canter-frame; forwardly-extending arms L pivoted to the rear of said frame; a curved hook N connecting the outer ends of the arms; and a cylinder intermediate of and connected to said arms for raising and lowering the same.

19. In a log-canter, the combination of a log-deck; a supporting-frame D secured below the same; a canter-frame pivoted within the support; log grasping and releasing mechanism carried by said canter-frame; a pivoted actuating-cylinder below the deck connected to the frame; and means for controlling the action of said cylinder and the log grasping and releasing mechanism.

20. In a log-canter, the combination of a canter-frame carrying a hook and a cylinder and piston for actuating the same; steam-inlets to said cylinder; a valve *u* for controlling the admission of steam to said cylinder; a valve-rod *t*; a pivoted arm *s* connected to said rod and provided with a slot in its end; and a handle or lever working in said slot for moving the arm.

21. In a log-canter, the combination of a pivoted canter-frame carrying a steam-actu-

ated cylinder and hook; a working cylinder for moving the frame; a stand as *q* having pivoted thereto slotted arms *p* and *s*; a lever *r* mounted in said stand its lower end working in the slots; and connections between said arms and the hook-actuating cylinder, and the working cylinder.

22. In a log-canter, the combination of a pivoted canter-frame; a steam-cylinder for moving the same; a valve for controlling the admission of steam to said cylinder; a rocker-arm *h* connected to the valve-stem; a counter-weighted cross-shaft *m*; arm *l* and links *i* and *j* connecting said shaft and rocker-arm *h*; stand *q*; lever *r*; slotted arm *p*; and arm *n* and link *o* connecting said arm *p* and the shaft.

23. In a log-canter, the combination of a pivoted canter-frame; a power-cylinder carried thereby; and a hook connected to the frame and the cylinder and adapted to be operated by the latter, substantially as described.

24. In a log-canter, the combination of a canter-frame; a power-cylinder carried thereby and adapted to move back and forth approximately parallel to the face thereof; a hook connected to said cylinder and provided with a slotted rear end; and a pivot-pin extending from the frame through said slot.

25. In a log-canter, the combination of a pivoted canter-frame; a hook carried thereby; means for operating the hook also carried by the frame; means for swinging said frame back and forth; and means operating in conjunction with the hook and the frame, for supporting a log thereon, holding it as the frame begins its backward movement, and discharging the log as the frame nears its limit of backward movement.

26. In a log-canter, the combination of a canter-frame; a power-cylinder for moving the same; a check-cylinder also connected to the frame; valves for said cylinders; and means for causing said valves to work in unison, substantially as and for the purpose described.

In witness whereof I hereunto set my hand in the presence of two witnesses.

EDWARD EUGENE FITZGERALD.

Witnesses:

B. T. LEUZARDER,
GEO. H. BURNHAM.