

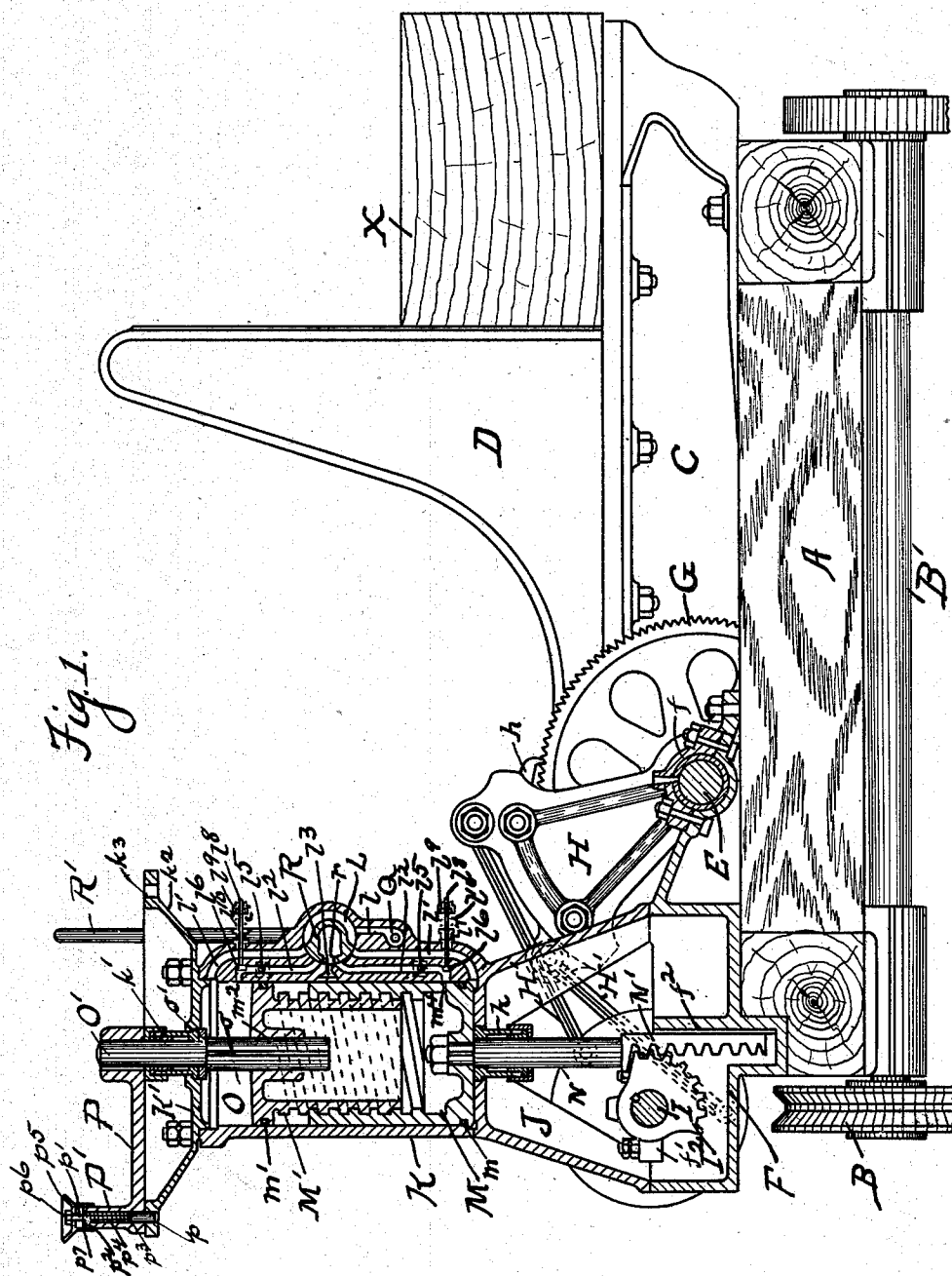
No. 714,269.

Patented Nov. 25, 1902.

J. WALTON.
SAWMILL SET WORKS.
(Application filed Feb. 23, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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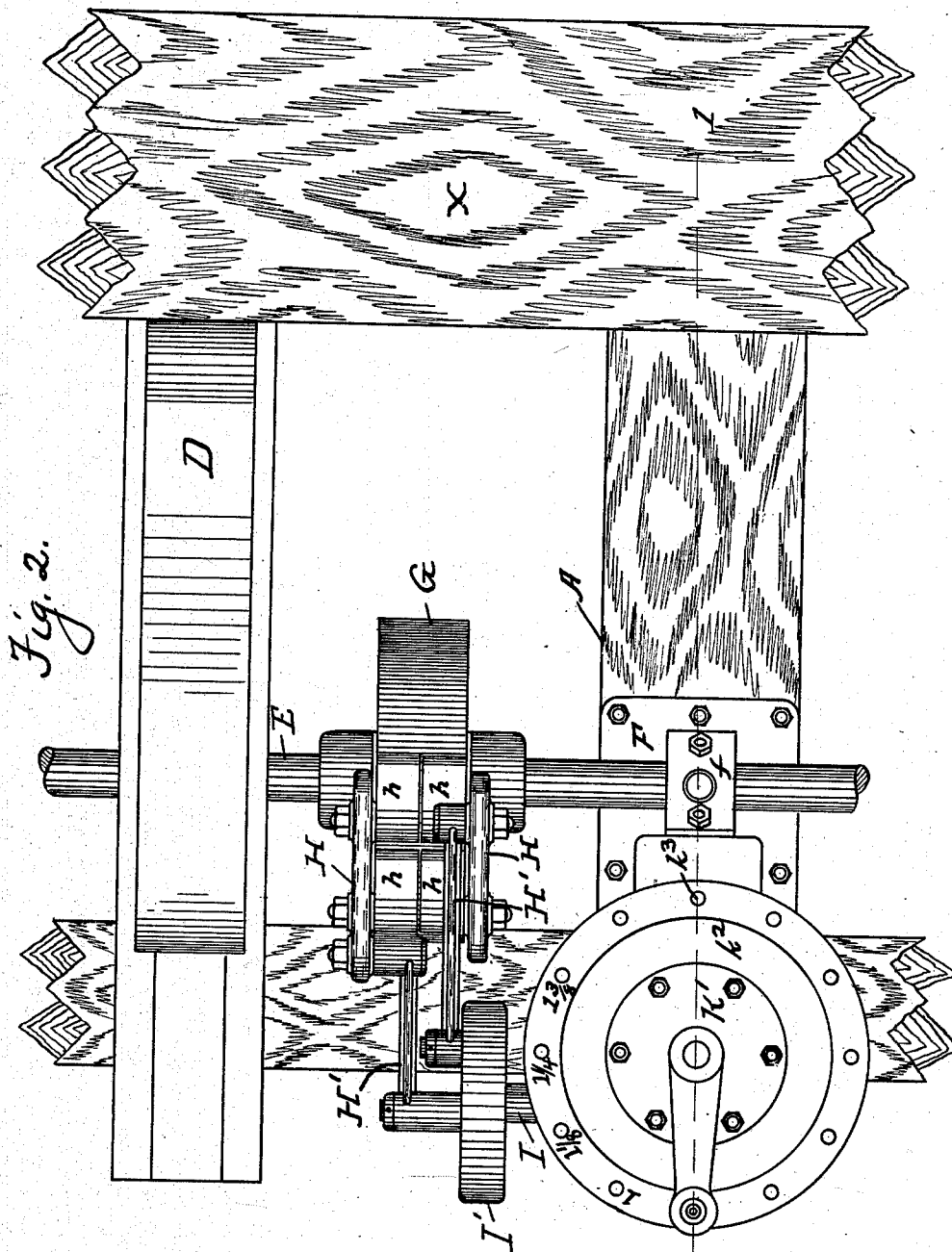
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3 Sheets—Sheet 2.



WITNESSES:

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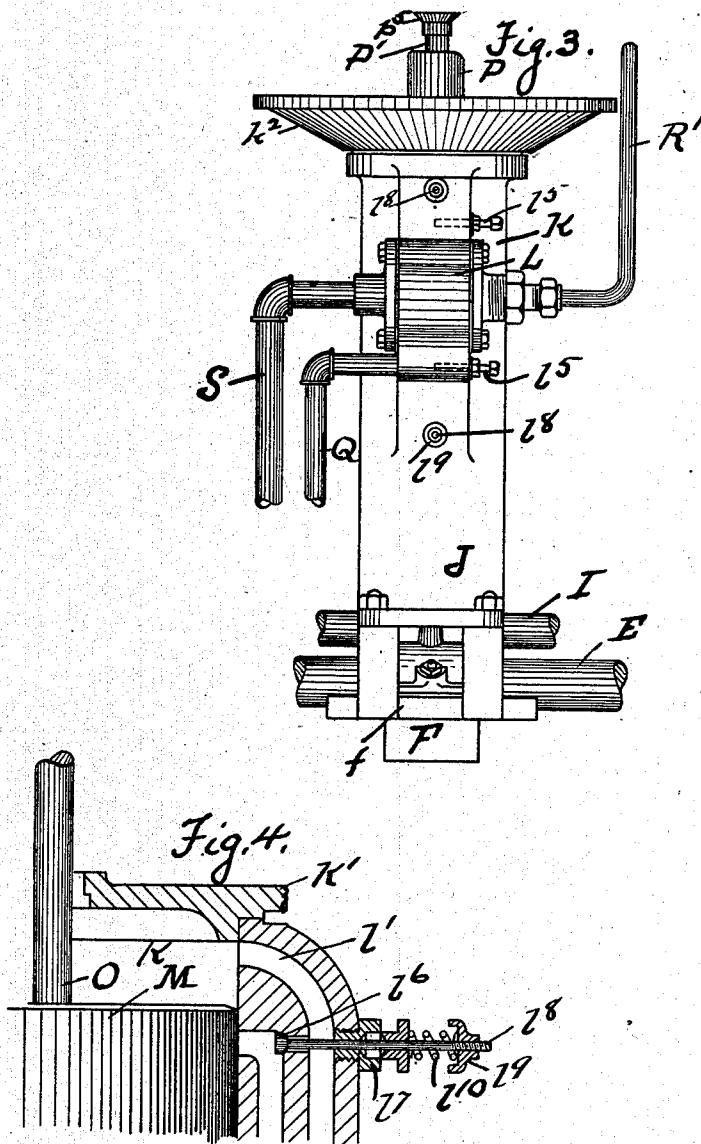
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(Application filed Feb. 28, 1901.)

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3 Sheets—Sheet 3.



WITNESSES:
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UNITED STATES PATENT OFFICE.

JOHN WALTON, OF MILWAUKEE, WISCONSIN, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO ALLIS-CHALMERS COMPANY, A CORPORATION OF NEW JERSEY.

SAWMILL SET-WORKS.

SPECIFICATION forming part of Letters Patent No. 714,269, dated November 25, 1902.

Application filed February 23, 1901. Serial No. 48,481. (No model.)

To all whom it may concern:

Be it known that I, JOHN WALTON, 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 Sawmill Set-Works; and I do hereby 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 appertains to make and use the same.

This invention relates to sawmill set-works; and it consists in certain improvements in the construction thereof, as will be hereinafter fully described, and pointed out in the claims.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 shows a section of the device on the line 1 1 in Fig. 2. Fig. 2 shows a plan view of the device; Fig. 3, an elevation looking from the right of Fig. 1; Fig. 4, a section of a fragment of the device, showing an enlarged view of the port and of the cylinder construction.

A marks the carriage-frame; B, the carriage-wheels, which are mounted on the axle B'; C, the blocks, on which is placed a log X, and D the knee. The knee is provided with the usual rack, and this is meshed by a pinion, (these parts not shown.) The pinion is fixed on the set-shaft E, and this shaft is journaled in the boxes *f* in the base-plate F of the set-works. Mounted on the set-shaft E is a ratchet-wheel G. Rock-arms H are journaled at each side of the ratchet-wheel G on the shaft E, and each carry ratchet-pawls *h*. Links H' H' connect the rock-arms H with an oscillating disk I', said links being connected to the disk at each side of its center. The disk I' is mounted on the shaft I. The shaft I is journaled in the box *f'*, mounted on the base F. Extending from the base F is a frame J, with which the cylinder K is preferably integrally cast. A steam-chest L, with the ports leading from it to the cylinder, is also preferably arranged in this same casting. A piston-section M is fitted in the cylinder K and has extending from it the piston-rod N. A rack N' is secured to the end of the piston-rod and operates in the guide *f*² in the base-plate F. The rack meshes a gear I², which is fixed on the shaft I. The piston-

section M is hollow and is closed only at its bottom end. The interior of the section is screw-threaded, and into this is screwed a piston-section M', which is provided with an external screw-thread for this purpose.

A rod O extends through an opening *m*² in the upper end of the section M' and is provided with the spline *o*, which is arranged to move in a groove (not shown) in the section M', so as to lock the rod O against rotative movement in the opening *m*². The rod O, however, forms a sliding fit, which permits a reciprocation of the piston on it, and preferably forms a steam-tight joint in the opening *m*². Extending from the rod O is a reduced portion O', which passes through a stuffing-box *k'*. This stuffing-box is mounted on the cylinder-head. The shoulder *o'*, formed between the rod O and the extension O', rests against the cylinder-head M² and prevents an upward movement of the rod O. Keyed to the upper end of the extension O' is the crank-arm P, and extending upwardly from this is the crank-pin P'. The pin P' is sleeve-shaped, and in the opening is a set-pin *p*. Extending from the set-pin is a stem *p'* of smaller diameter than the set-pin. The upper end of the stem P' is provided with an inwardly-projecting shoulder *p*², and a spring *p*⁴ is tensioned against the shoulder formed by the projection *p*² and the shoulder *p*³. The upper end of the extension passes through a knob *p*⁵ and is secured in place by a nut *p*⁶. The knob has the sleeve portion *p*⁷, which telescopes the pin P', and thus forms a guide for the knob. The cylinder is provided with a flange *k*², in the outer edge of which are perforations *k*³, arranged to come into register with the set-pin *p* as the arm is turned. On the face of the flange *k*² are arranged figures which indicate the adjustment of the piston with the set-pin in the different holes. It will readily be seen that by turning the crank P the piston-section M' is turned and is screwed into or out of the section M, so as to lengthen or shorten the piston. The effect of thus lengthening or shortening the piston is to lengthen or shorten the stroke of the piston. The faces of the piston form stops which are carried by the piston. These contact with the cylinder-head. The section

M is preferably provided with the piston-ring *m* and the section M' with the section *m'*, so as to make the piston practically steam-tight so far as the intermediate portions are concerned. If, however, steam should leak through the opening *m*², a jet-opening *m*⁴ is provided which comes opposite an exhaust-port with each stroke of the piston and allows a discharge of the water or steam from the interior of the piston. The valve mechanism is as follows: The steam-chest is preferably cylindrical and has a rock-valve R arranged in it. Secured to the valve is a handle R', by which it may be operated. The valve is of the ordinary D-shape. Steam enters by the pipe Q and port *l* to the body of the steam-chest. As the valve is turned it is allowed to pass through the ports *l'* on either side as the valve is moved. The port *l'* extends to the extreme end of the cylinder and so operates upon the piston when it is resting against the cylinder-head. A second port *l*², which may be termed the "exhaust-port," enters the valve-chest between the ports *l'* and the exhaust-passage *l*³. The exhaust-passage connects with the exhaust-pipe S. Arranged between the ports *l'* and *l*² are the puppet-valves *l*⁶. These are provided with a stem *l*⁸, which extends through a stuffing-box *l*⁷. At the outer end of the stem is an adjusting-nut *l*⁹, and between the stuffing-box and this adjusting-nut is a spring *l*¹⁰. By adjusting the spring any pressure may be given to the valve desired. Extending into the exhaust-port *l*² are the valve-plugs *l*⁵, the purpose of which is to reduce the capacity of the ports to any point desired. The operation of this mechanism is as follows: The operator grasps the handle R' and turns the valve, so as to permit steam to enter one end of the cylinder, (with the parts in the position shown to enter the bottom cylinder.) This brings the exhaust-port *r* of the valve in a position to connect the exhaust-passage *l*³ and the exhaust-port *l*² at the opposite end of the cylinder. The plug-valve *l*⁵ prevents a rapid exhaust movement of steam and regulates the speed of this movement of the piston. After the piston passes the opening of the port *l*² the steam in the end of the cylinder is confined and forms a cushion, the tension of which is adjusted by the pressure exerted upon the valve *l*⁶. When this tension is reached, the valve *l*⁶ is opened by the pressure and the steam or fluid allowed to exhaust through the passage *l*². By reversing the lever R' the operation is the same at the opposite end of the cylinder. It will be seen that with this device the speed is controlled at the initial movement of the piston by the valve *l*⁵ and that it may be cushioned and slowed down to any speed desired at the end of the stroke by the tension of the valve *l*⁶, and this prevents the ratchet mechanism from "carrying" by. The effect on the ratchet-wheel is to move it forward with the movement of the piston in both directions. The

adjustment of the piston is shown on the flange by the figures on the flange and can be made so as to give any movement to the log desired, so as to permit of a cut of any thickness. The adjustment can be made so as to require a movement in both directions of the piston, or the adjustment can be made so that the desired movement of the log may be accomplished by a movement of the piston in one direction.

What I claim as new is—

1. In a sawmill set-works, the combination with the log-moving mechanism; of a cylinder; a piston arranged in said cylinder; connecting means between said piston and said log-moving mechanism, whereby said log-moving mechanism may be actuated by said piston; and means for varying the length of said piston to vary its stroke.

2. In a sawmill set-works, the combination with the log-moving mechanism; of a cylinder; a piston arranged to operate in said cylinder; means for varying the length of said piston to vary its stroke; connecting means between said piston and log-moving mechanism whereby said piston actuates said log-moving mechanism; and a cushion device for regulating the speed of the piston.

3. In a sawmill set-works, the combination with the log-moving mechanism; of a cylinder; a piston arranged to operate in said cylinder; means for varying the length of said piston to vary its stroke; connecting means between said piston and log-moving mechanism whereby said piston actuates said log-moving mechanism; and a cushion device arranged to be brought into action only at the ends of the stroke for cushioning the parts and regulating the speed of the piston at the end of the stroke.

4. In a sawmill set-works, the combination with the log-moving mechanism; of a cylinder; a piston arranged in said cylinder, said piston being formed of screw-sections, one section being arranged to screw into the other; a connection between said piston and log-moving mechanism; and means for positively locking the sections in a position to which they may be adjusted.

5. In a sawmill set-works, the combination with the log-moving mechanism; of a cylinder; a piston arranged in said cylinder, said piston being formed of screw-sections, one section being arranged to screw into the other; a connection between said piston and log-moving mechanism; and means for actuating one section relatively to the other from without the cylinder and for positively locking the sections in their adjusted positions.

6. In a sawmill set-works, the combination with the log-moving mechanism; of a cylinder; a piston arranged in said cylinder, said piston being formed of screw-sections, one section being arranged to screw into the other; a connection between said piston and log-moving mechanism; a rod secured to one of said sections and extending without the cyl-

inder; a crank on said rod; and means for locking the crank in different positions to positively lock the piston in different adjustments.

5 7. In a sawmill set-works, the combination with the log-moving mechanism; of a cylinder; a piston arranged in said cylinder, said piston comprising two sections, one of said sections being arranged to screw into the other
10 to vary the length of the piston; a rod extending from one of said sections; an arm on said rod; a dial over which the said arm moves; means for positively locking said arm in different positions to vary the adjustment
15 of the piston; and means for connecting the piston with the log-moving mechanism.

8. In a sawmill set-works, the combination with the log-moving mechanism; of the cylinder, K; the piston formed by the sections, M
20 and M', said section, M', being screwed into the section M; connections between the piston and the log-moving mechanism; the rod, O, arranged to slide in the section, M', with a spline-and-groove connection; the extension, O', passing through a stuffing-box; said
25 stuffing-box; the arm, P; the spring-actuating pin, p , on the arm, P; and the flange, k^2 , having the holes, k^3 , arranged to permit the pin, p , to be brought into register therewith.

30 9. In a sawmill set-works, the combination with the ratchet-wheel, G; a ratchet-arm, H, arranged to operate upon said ratchet; the link, H'; the oscillating disk, I'; the shaft, I, upon which the disk, I', is mounted; the gear, I², fixed on said shaft; the rack, N', arranged
35 to mesh said gear; the piston-rod, N, connected with said rack; the piston comprising the sections, M, and M', secured to the piston-rod, one of the sections being adapted to be screwed into the other; the rod, O, arranged
40 to slide in the section, M', with a spline-and-groove mechanism; the extension, O', thereon; the arm, P; on the extension, O'; the set-pin, p , carried by the arm, P; the flange, k^2 , having the opening, k^3 , in position
45 to permit the set-pin, p , to be brought into register therewith.

10. In a sawmill set-works, the combination with the log-moving mechanism; an engine
50 for actuating said mechanism, comprising a working piston; a cushioning device arranged to operate only at the end of the stroke, said cushioning device comprising a plunger and fluid-chamber; a passage for permitting the
55 exhaust of fluid from said chamber; a valve for closing said passage, arranged to be actuated by a predetermined pressure in said chamber and to open said passage when actuated; and means for varying the stroke of
60 the piston.

11. In a sawmill set-works, the combination with the log-moving mechanism; an engine for actuating said mechanism, comprising a cylinder and a working piston therein; a controlling-valve; two ports leading from said
65 valve to the end of the cylinder, one entering the cylinder at a distance from the end thereof and the other approximately at the end of the cylinder; and a valve adapted to be opened by a predetermined pressure in the
70 port leading from the end of the cylinder.

12. In a sawmill set-works, the combination with the log-moving mechanism; an engine for actuating said mechanism, comprising a cylinder and a working piston therein; a controlling-valve; two ports leading from said
75 valve to the end of the cylinder, one entering the cylinder at a distance from the end thereof and the other approximately at the end of the cylinder; a pressure-actuated valve
80 for the port leading from the end of the cylinder, and arranged to be actuated by a predetermined pressure in the port; and means for adjusting the valve to act at different pressures.
85

13. In a sawmill set-works, the combination with the log-moving mechanism; an engine for actuating said mechanism, comprising a cylinder and a working piston; a steam-chest, L'; the valve, R, therein; the ports, l' and
90 l^2 , leading therefrom, the port, l' , leading to the end of the cylinder and the port, l^2 , leading to a point in the cylinder at some distance from the end; a passage between the
95 ports l' l^2 ; the valve, l^6 , controlling the movement of steam through said passage; means for varying the seating pressure on the valve; and the valve, l^5 , in the port, l^2 .

14. In a sawmill set-works, the combination with the log-moving mechanism; of an engine
100 for actuating said mechanism comprising a cylinder and a working piston, said piston being arranged to be lengthened or shortened to vary the stroke of the piston; a steam-chest, L; the valve, R, therein; the ports, l' ,
105 l^2 ; leading therefrom, the port, l' , leading to the end of the cylinder and the port, l^2 , leading to a point in the cylinder at some distance from the end; a passage between the ports l' l^2 ; the valve, l^6 , controlling the movement of
110 steam through said passage; means for varying the seating pressure on the valve; and the valve, l^5 , in the port, l^2 .

In testimony whereof I affix my signature in presence of two witnesses.

JOHN WALTON.

Witnesses:

E. H. LURZANDEN,
B. A. BRENNAN.