No. 694,780. Patented Mar. 4, 1902.

C. S. PRESCOTT.

STEAM SET WORKS.

(Application filed Oct. 17, 1900.)

(No Model.) 4 Sheets—Sheet 1.

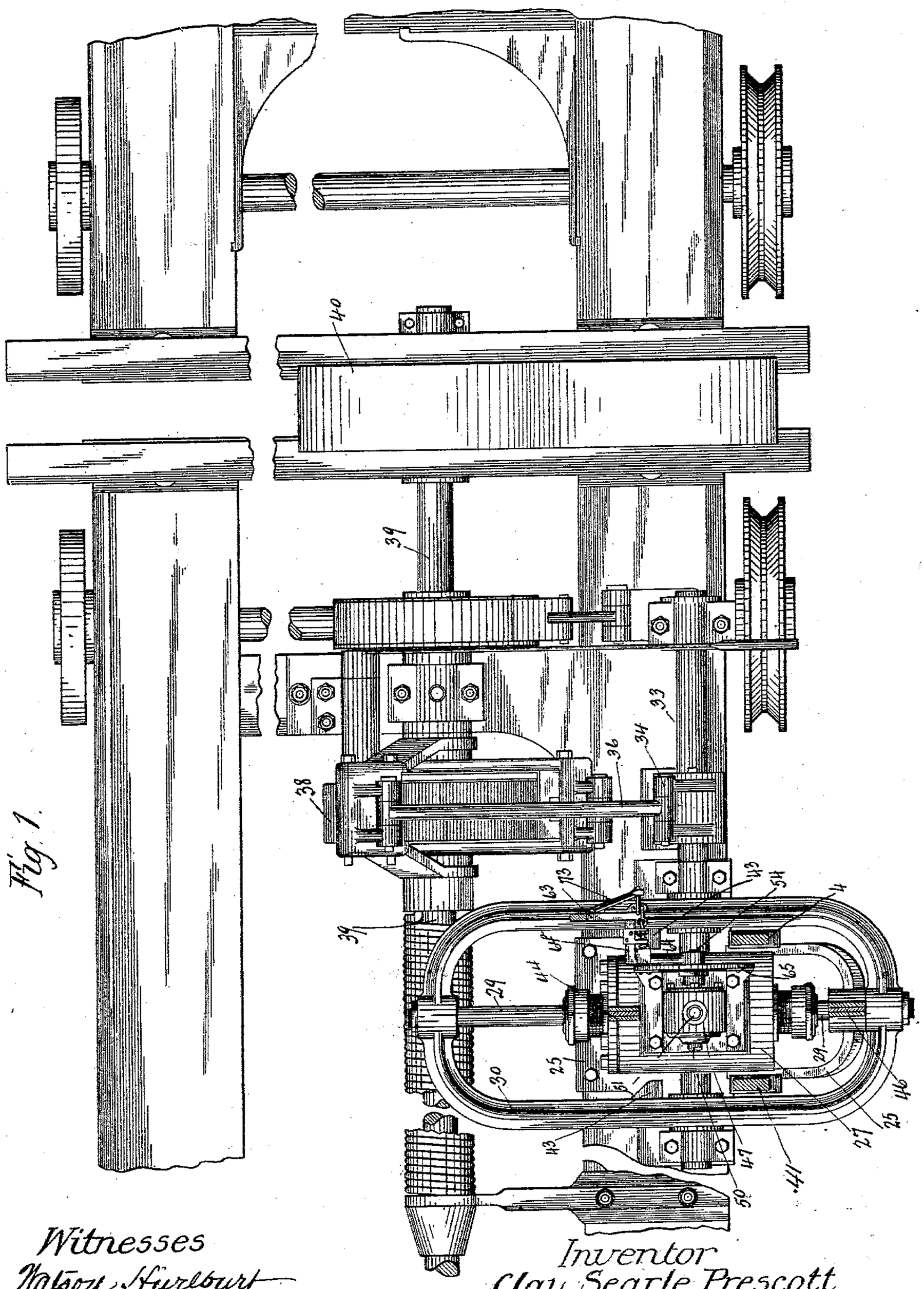

Fig. 1.

Witnesses
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(No Model.)

4 Sheets—Sheet 2.

Fig. 2.

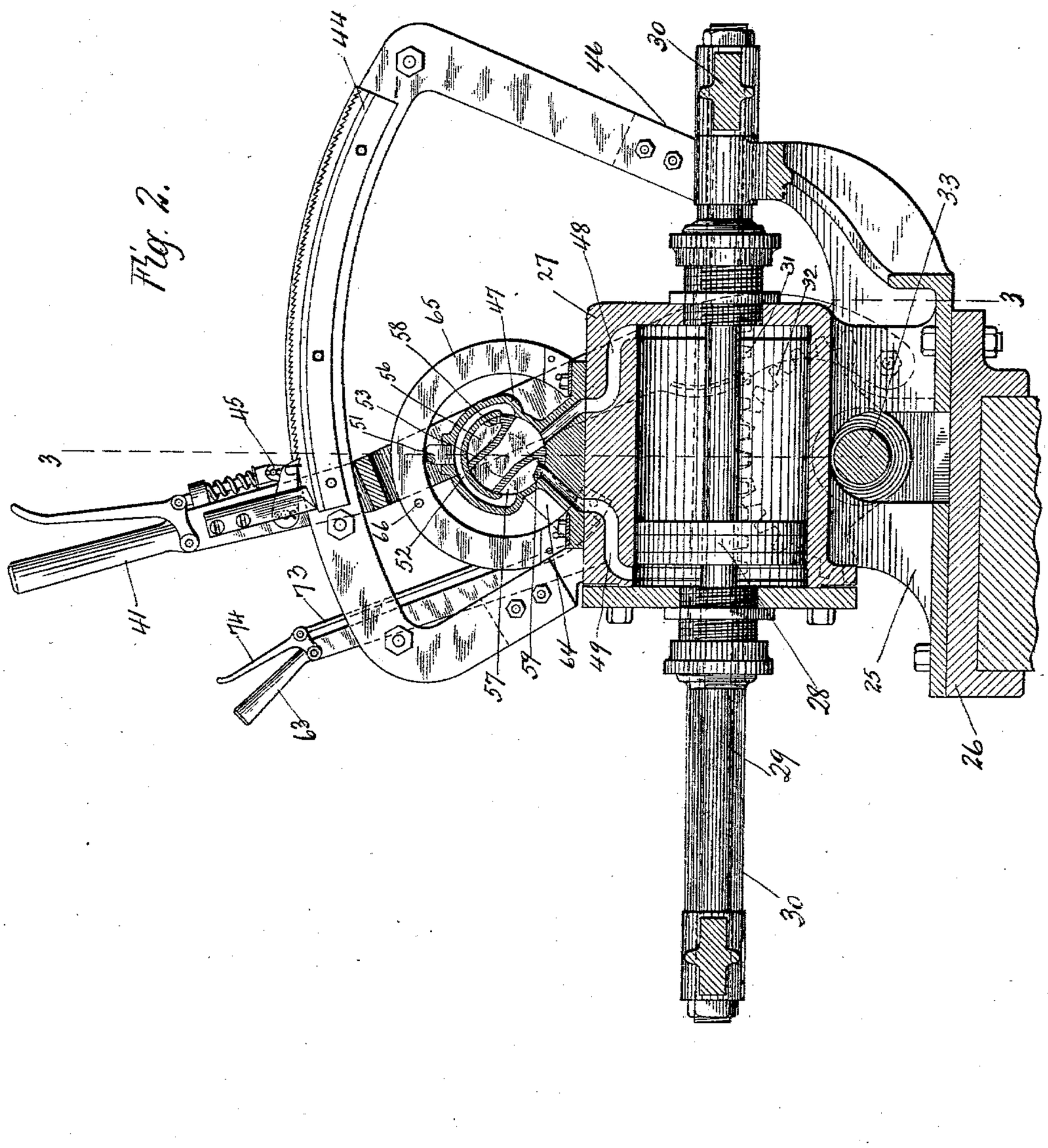

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Fig 5

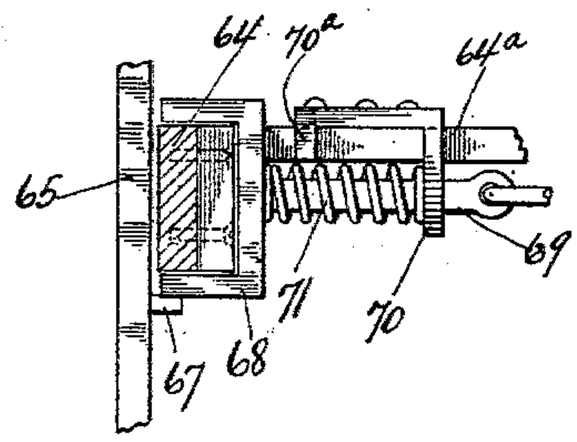
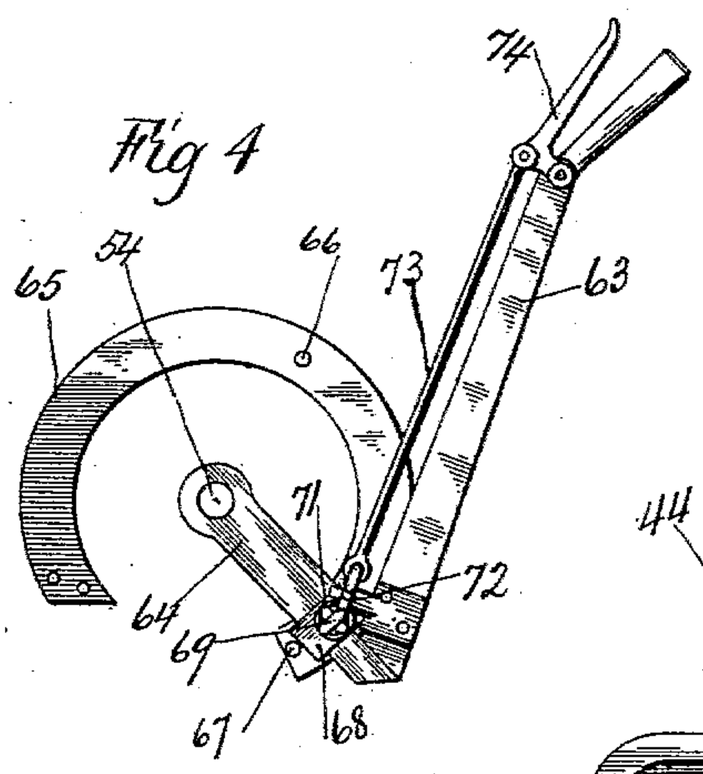


Fig 4



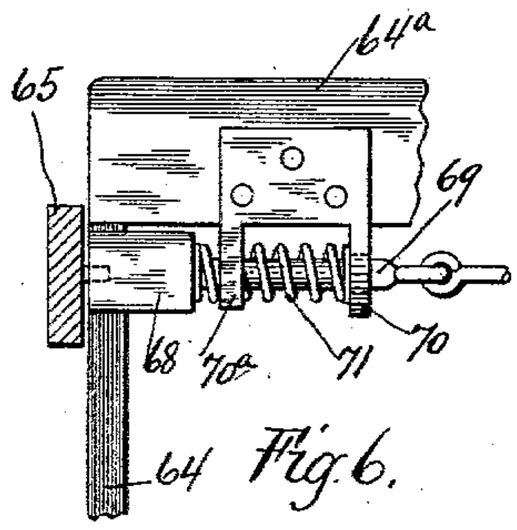


Fig. 6.

Fig. 3

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(Application filed Oct. 17, 1900.)

(No Model.) 4 Sheets—Sheet 4.

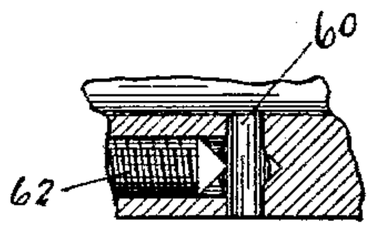

Fig 7

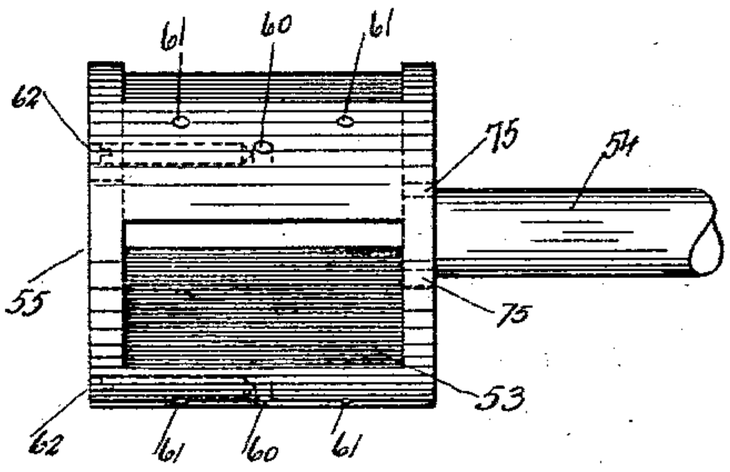

Fig 8

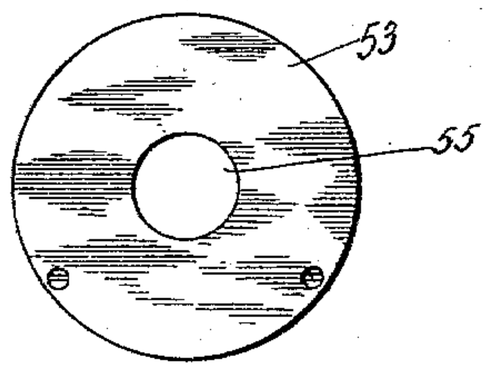

Fig 9

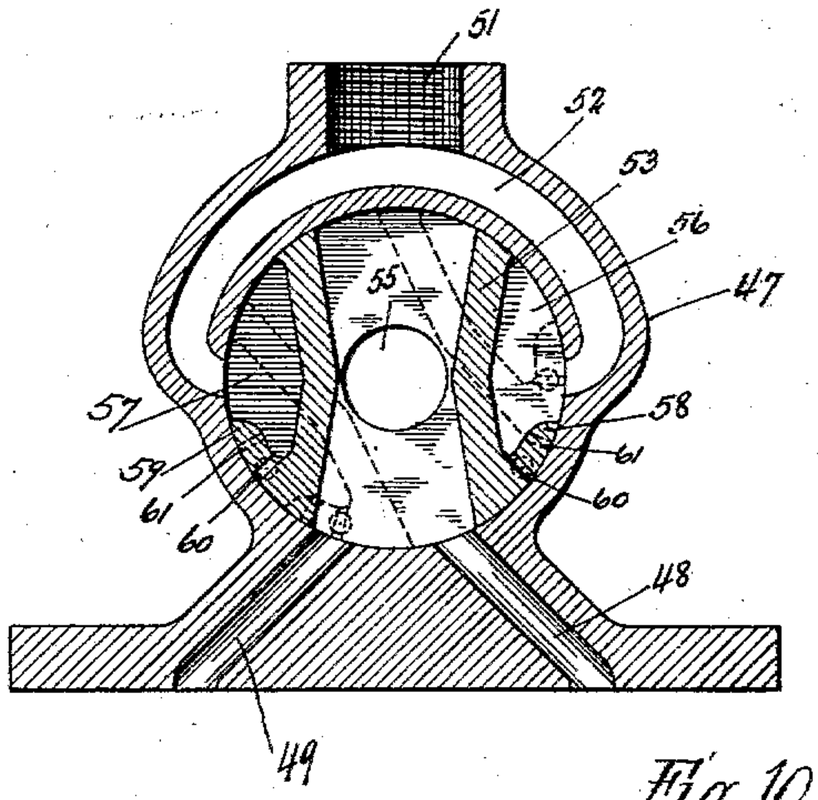

Fig 10

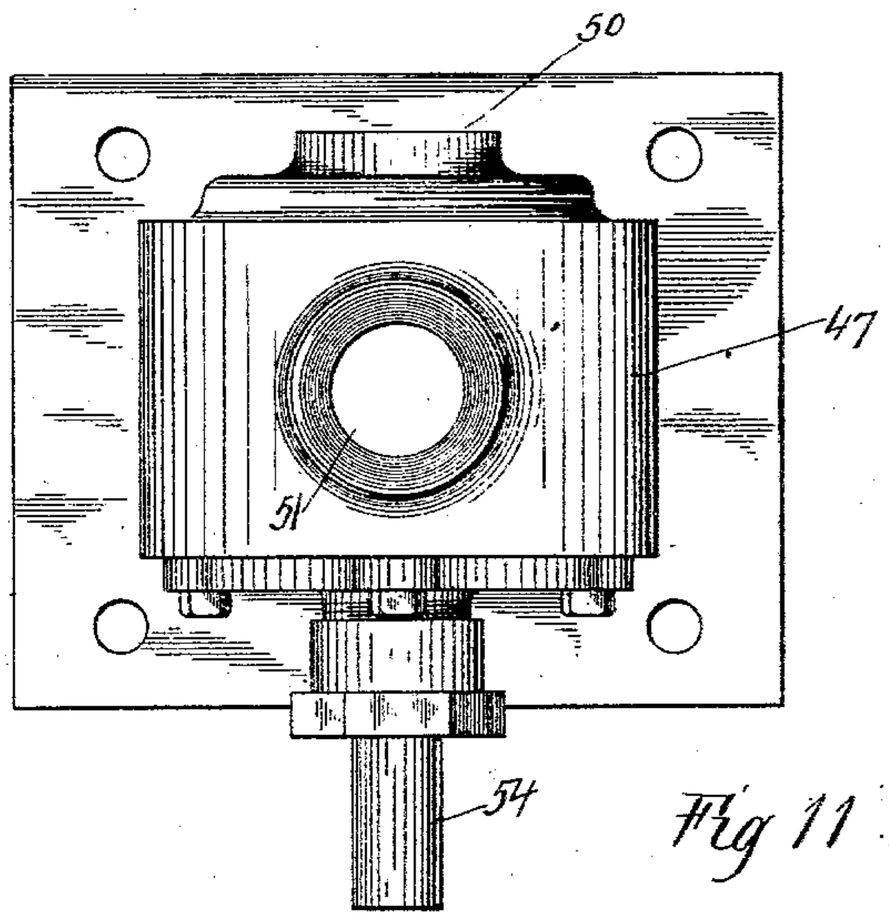

Fig 11

Witnesses
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UNITED STATES PATENT OFFICE.

CLAY SEARLE PRESCOTT, OF MENOMINEE, MICHIGAN, ASSIGNOR OF ONE-HALF TO THE D. CLINT PRESCOTT CO., A CORPORATION OF WISCONSIN.

STEAM SET-WORKS.

SPECIFICATION forming part of Letters Patent No. 694,780, dated March 4, 1902.

Application filed October 17, 1900. Serial No. 33,376. (No model.)

To all whom it may concern:

Be it known that I, CLAY SEARLE PRESCOTT, a citizen of the United States, and a resident of Menominee, county of Menominee, and State of Michigan, have invented certain new and useful Improvements in Steam Set-Works, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to that type of steam set-works in which the power for advancing the knees is derived from a reciprocating engine preferably driven by steam; and its objects are to provide improved means for cushioning the engine and to generally simplify and improve the construction.

The invention consists in the mechanism hereinafter described and which is illustrated in the accompanying drawings, in which—

Figure 1 is a detail plan view, partly in section, of a sawmill-carriage and its set-works. Fig. 2 is a vertical longitudinal sectional view of the power mechanism of the set-works. Fig. 3 is a sectional view on the line 3 3 of Fig. 2, some of the parts being shown in elevation. Figs. 4, 5, and 6 are details of the hand-lever for controlling the valve of the motor. Figs. 7, 8, and 9 are details of the valve. Fig. 10 is a transverse vertical section through the steam-chest and the valve, and Fig. 11 is a plan view of the steam-chest.

The bed-plate of the motor is shown at 25 and is adapted to be bolted to the platform 26 of a sawmill-carriage and supports a cylinder 27, within which there reciprocates a piston 28, mounted upon a piston-rod 29, extending through both heads of the cylinder and connected at both ends with an oblong rectangular frame 30, which incloses the cylinder. The side members of the frame 30 are formed into racks 31, which intermesh with segmental gears 32, fixed upon the rocker-shaft 33, which is provided with the crank-arms 34 35, carrying, respectively, the pawls 36 37 for driving the ratchet-wheel 38, mounted upon the set shaft 39, whereby the knees 40 are caused to reciprocate.

A bifurcated stop-lever 41 is pivoted at the lower end of its legs to upstanding flanges of the bed-plate 25, as shown at 42, so that it straddles the cylinder 27. This stop-lever cooperates with stop-lugs 43, formed upon the side members of the frame 30, so as to positively limit the travel of this frame in one direction. It also coöperates with a quadrant 44, mounted at one end upon the cylinder 27 and at the other end upon a bracket 46, rising from the bed-plate 25 and serving as well as a guide for the piston-rod 29 and a positive stop therefor in one direction of its movement. A spring-pawl 45, carried by the lever 41, engages ratchet-teeth on the quadrant 44, so that the lever may be set in any desired position for the purpose of controlling the length of the stroke of the piston and its appurtenances.

A valve-chest 47 is mounted on top of the cylinder 27, and passages or ports 48 49 lead from its chamber through the cylinder-walls to opposite ends of the cylinder-chamber. The steam-chest is provided with the port 50 for the admission of steam and with an exhaust-port 51, the latter leading from a passage 52, both ends of which open to the chamber of the steam-chest a short distance from the ports 48 49. A rocking or oscillating valve 53 is set within the steam-chest and is provided with a central radial cavity of sufficient width at one of its ends to include both of the ports 48 49, this cavity being in communication, by means of a port 55, with the steam-port 50. The valve is provided with a stem 54, by which it is manually controlled, and with peripheral exhaust-cavities 56 57. Laps 58 59 extend backwardly from the inner end of the central cavity of the valve partially across its peripheral exhaust-cavities, and these laps are provided with apertures, preferably a plurality of sets thereof, as shown at 60 61, which may be brought into register with the ports 48 49 for permitting the slow exhaust of the steam from the cylinder.

In order to regulate the exhaust and adapt it to the pressure of steam at which the particular engine is designed to be operated, means should be provided for reducing some or all of the apertures in the laps 58 59. Such means are shown in the drawings and con-

sist of a screw 62, set in from the end of the valve 53 and entering one of the apertures, as 60. By turning the screw forward this aperture is partially or, if desired, entirely closed.

A hand-lever is attached to the valve-stem 54, and in order to bring it within convenient reach of the operator and prevent it from interfering with the free movement of the stop-lever 41 it is bent or made of three members, as 63, 64, and 64ª, the member 64 being fixed to the valve-stem 54 so that it may sweep a suitably-supported quadrant 65, and the intermediate member 64ª connecting it with the grip member 63.

In order to limit the movement of the valve, stop-pins 66 67 are set in the quadrant 65 so as to cross the path of the member 64 of the hand-lever. For the purpose of adjustably limiting the throw of the valve in order that one or more of its exhaust-apertures may come into register with the ports 48 49 a U-shaped plate 68 is mounted upon the lever member 64 so as to contact with the pins 66 67, this plate being movable to permit the valve to travel still farther until the lever member 64 itself comes into contact with the stop-pin. For the purpose of controlling the adjusting-plate 68 the latter is provided with a stem 69, working through a guide-loop 70, fixed to the member 64ª, and carrying a spring 71, reacting between the guide-loop 70 and the back of the plate 68, so as to normally hold the latter in its advanced position. A stop 70ª is also provided for limiting the backward movement of the plate 68. The stem 69 is connected, by means of a link, with a bell-crank 72, pivotally attached to the hand-lever, and connected, by means of a link 73, with a handpiece 74 at the upper end of the grip member 63, so that as the operator throws the valve he may, if he desires, withdraw the adjusting-plate 68 to permit the full throw of the valve, but by leaving this plate in its normal position may have a positive stop for the valve in its limited range of movement.

When the machine is in use, the piston 28 is normally at one end of the cylinder 27 and is firmly held there by constant steam-pressure, the valve 53 being in the position shown in Fig. 2. In order to advance the knees, the valve-controlling lever is thrown forward to bring the central cavity of the valve into register with the steam-passage 49, the lap 58 of the valve being thrown across the passage 48 and the exhaust-cavity 56 of the valve being open to the exhaust-passage 52. The piston is moved to the opposite end of the cylinder, but with a retarded speed, by reason of the slow exhaust of the steam in front of it through the aperture 60 or 60 and 61. As soon as the piston has reached the farther end of the cylinder or been stopped by contact of the lugs 43 with the legs of the lever 41 the hand-lever is thrown backwardly to bring the valve to the position shown in Fig. 2, and the piston is thereby moved to its initial position. This stroke of the piston, causing a reciprocation of the frame 30, oscillates the rocker-shaft 33 and advances the set shaft 39 in the usual manner.

If a small log is upon the carriage, a stronger cushioning action will be necessary than if a heavy log is mounted thereon, and this is controlled by means of the adjusting-plate 68 according to the judgment of the operator. It is obvious that this adjusting-plate may be dispensed with, so that the operator will depend upon his own skill in throwing the valve to the desired position, thereby making it possible to secure a still finer adjustment of the cushioning action. If desired, the operator may leave the valve normally in the position shown in Fig. 10, so that steam will be admitted to both ends of the cylinder. In order to properly balance the valve, its central cavity is extended entirely across it, and ports, as indicated at 75, may lead from its central cavity through the end of the valve opposite the port 51.

By using a piston-rod which extends through both heads of the cylinder I not only equalize the face area of both sides of the piston, but I am able to render the entire device exceedingly compact and simple.

The central valve-cavity is of sufficient width to span both of the cylinder-ports, so that when the valve is brought to a central position steam is admitted to both sides of the piston.

While I have shown and described an oscillating valve, I do not desire to be limited to this form.

I claim as my invention—

1. In combination with log-moving mechanism for a sawmill-carriage, a fluid-motor for actuating such mechanism, ports for service and exhaust, means movable to control said ports uniformly for service and variably for exhaust, and means for controlling the motor, such means opening the service-ports uniformly and the exhaust-ports variably.

2. In combination with log-moving mechanism for a sawmill-carriage, a fluid-motor for actuating such mechanism, and means for controlling the supply and exhaust of fluid, the former uniformly, and the operation of which to open the exhaust variably controls such exhaust, such means opening the service-ports uniformly and the exhaust-ports variably.

3. In combination with log-moving mechanism for a sawmill-carriage, a fluid-motor for actuating such mechanism, and means for controlling the motor, such means opening the service-ports uniformly and the exhaust-ports variably in accordance with the position of the same.

4. In combination with log-moving mechanism for a sawmill-carriage, a fluid-motor for actuating such mechanism, and means for controlling the motor and providing an adequate

supply of fluid for the prompt performance of the work and varying the exhaust, while the motor is in action.

5. In combination with the set-works of a sawmill-carriage, a motor for actuating such set-works, a controlling-valve for the motor, and means controllable with the valve for varying the exhaust-passage while the motor is in action.

6. In combination with log-moving mechanism for a sawmill-carriage, a fluid-motor for actuating such mechanism, and means for controlling the admission and exhaust of fluid-pressure thereto and therefrom, and means acting with such controlling means for varying the exhaust, while the motor is in action.

7. In combination, mechanism for moving logs on a sawmill-carriage, a reciprocating engine for actuating such mechanism, a valve for such engine having an induction-port capable of admitting steam to the full capacity of the engine and having restricted and graduated exhaust-ports, and adjustable means for limiting the throw of the valve.

8. In combination with a sawmill set-works, a reciprocating steam-engine having steam-passages leading to opposite ends of its cylinder, a steam-chest having induction and exhaust ports, a rock-valve within the chest and having a central cavity open to the induction-port and adapted to communicate with the cylinder-passages, and having graduated ports adapted to connect the cylinder-passages with the exhaust-ports of the chest, and adjustable positive stops for limiting the throw of the valve.

9. In combination with the set-works of a sawmill, a steam-cylinder, a piston reciprocating therein, a piston-rod fixed to the piston and projecting through both heads of the cylinder, a yoke-shaped frame inclosing the cylinder and attached to both ends of the piston-rod, stop-lugs formed on the frame, an adjustable stop-lever crossing the path of the lugs, and means for operatively connecting such frame with the set-works.

10. In combination with a sawmill set-works, a reciprocating steam-engine having steam-passages leading to opposite ends of its cylinder, a steam-chest having induction and exhaust ports, a rock-valve within the chest and having a central cavity open to the induction-port and adapted to communicate with the cylinder-passages and having graduated ports adapted to connect the cylinder-passages with the exhaust-ports of the chest, a hand-lever for moving the valve, stops for limiting the movement of the lever, a U-shaped plate fitting upon the lever for engaging such stops, and means for withdrawing such plate.

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Witnesses:
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