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PATENTED FEB. 5, 1907.

A. A. FULLER & D. K. CARTTER.  
STOP MECHANISM FOR STEAM ENGINES.  
APPLICATION FILED AUG. 14, 1906.

3 SHEETS—SHEET 1.

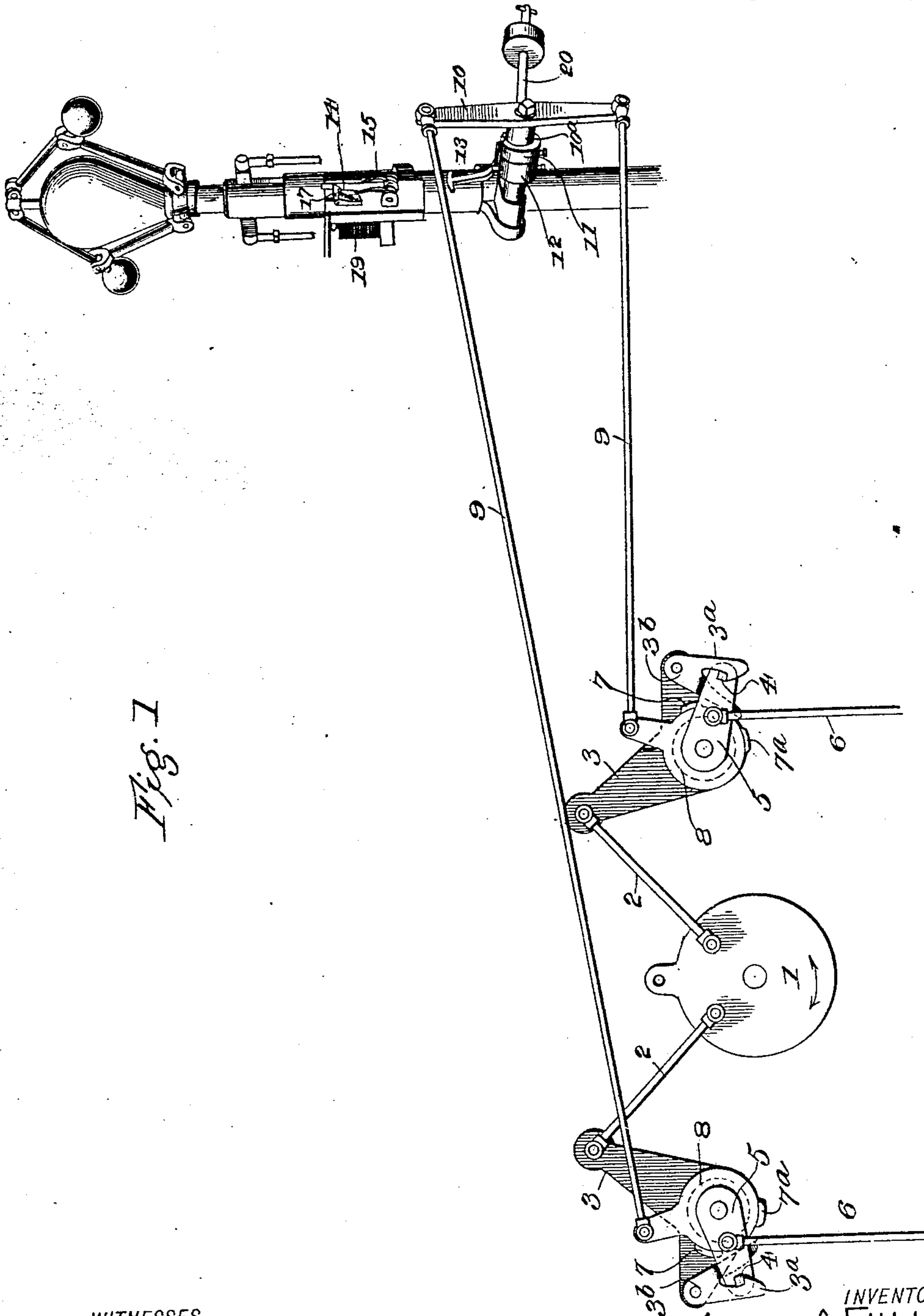


Fig. 1

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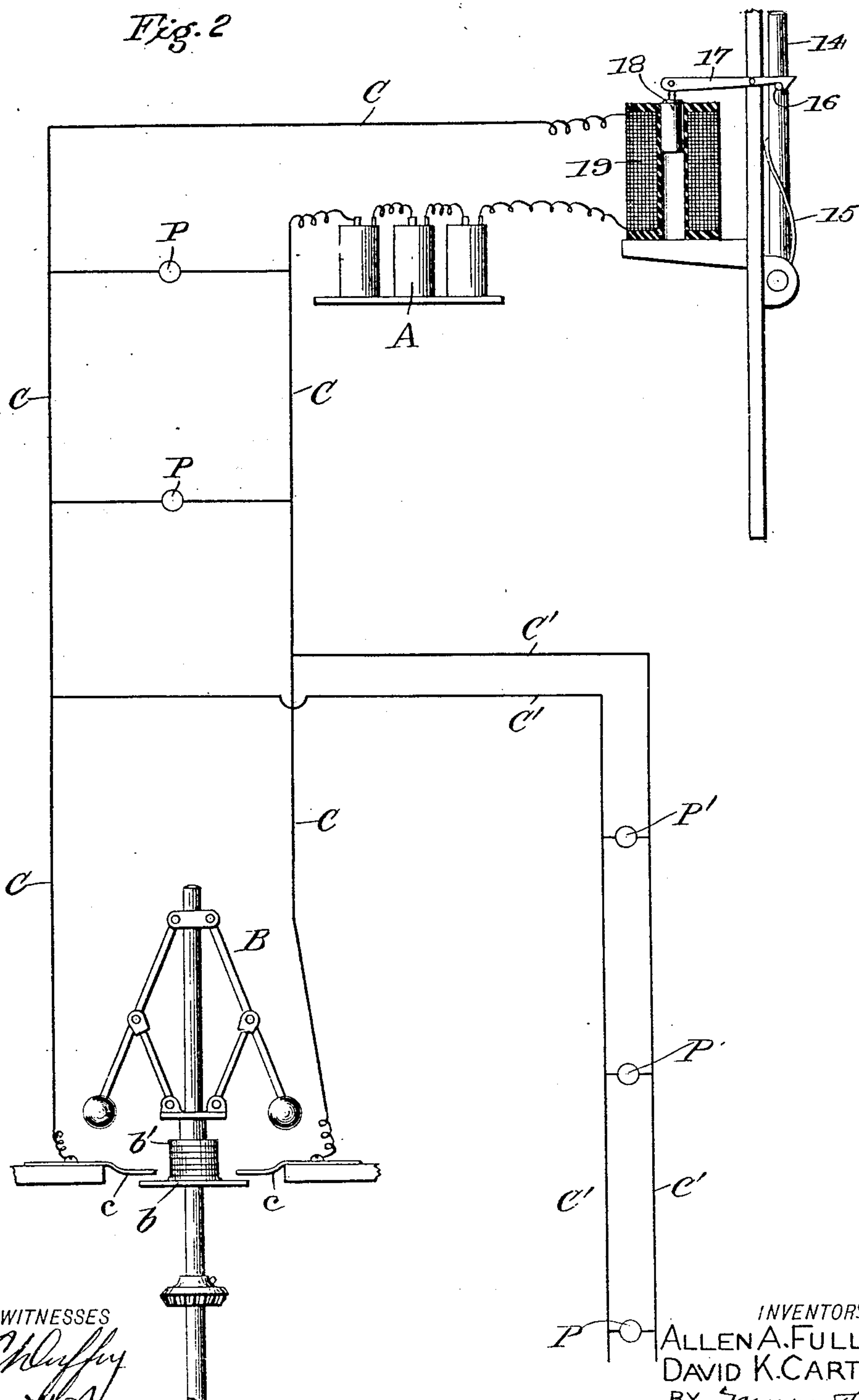
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3 SHEETS—SHEET 2.

Fig. 2



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3 SHEETS—SHEET 3.

Fig. 3

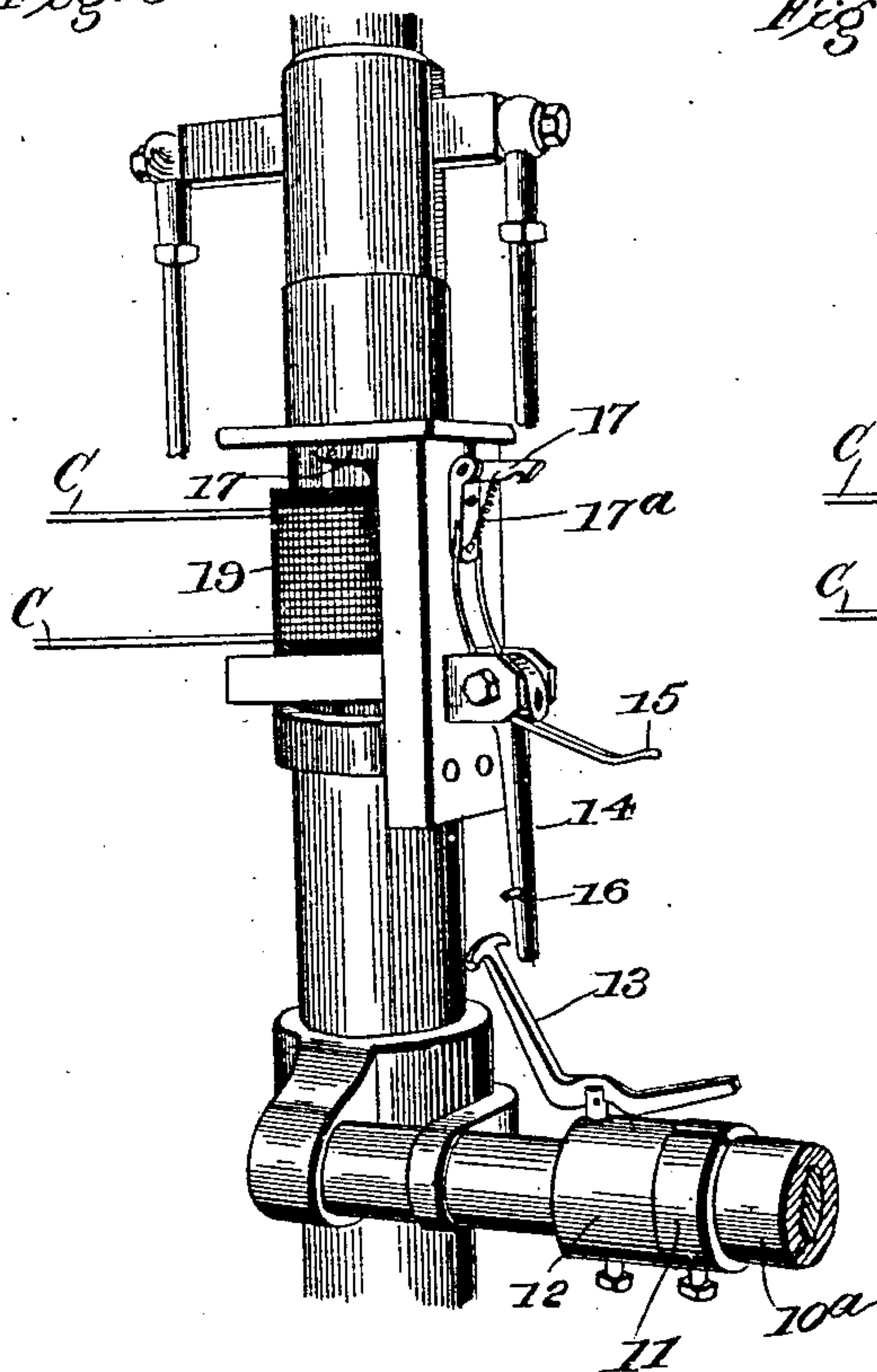


Fig. 4

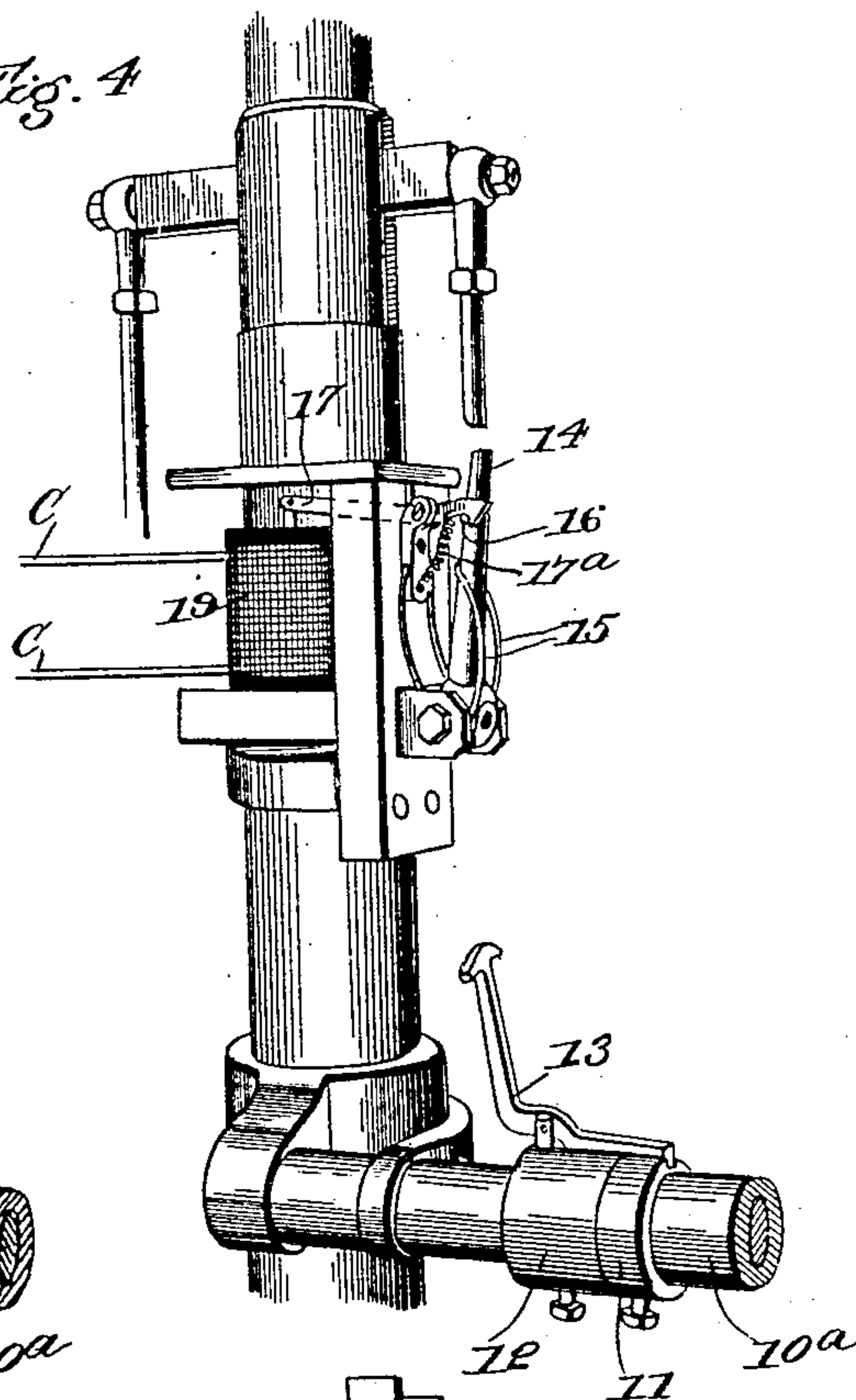
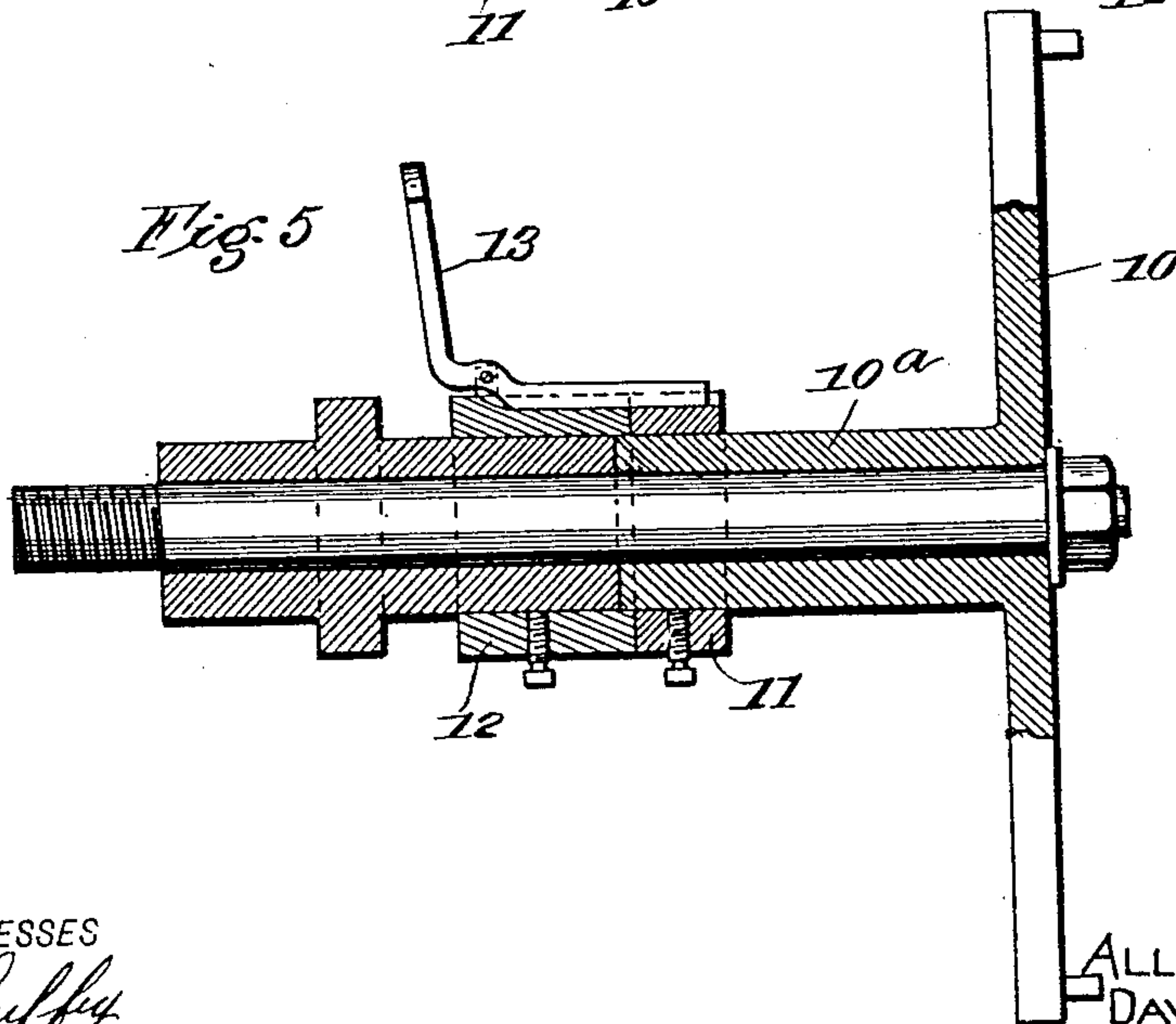


Fig. 5



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# UNITED STATES PATENT OFFICE.

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## STOP MECHANISM FOR STEAM-ENGINES.

No. 843,528.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed August 14, 1906. Serial No. 330,552.

*To all whom it may concern:*

Be it known that we, ALLEN A. FULLER and DAVID K. CARTTER, citizens of the United States, residing at Jasper, in the county of Walker and State of Alabama, have invented a new and useful Improvement in Stop Mechanism for Engines, of which the following is a specification.

Our invention is in the nature of a stop device for at will throwing a Corliss steam-engine or other engine out of gear from any part of a plant or by the automatic action of its governor when racing or running wild.

It consists in the novel construction and arrangement of electromagnetic tripping devices and their connection with the valve-gear, as hereinafter fully described with reference to the drawings, in which—

Figure 1 is a perspective view of the stop devices shown interposed between the governor and valve-gear. Fig. 2 is a diagrammatic view of the circuits connecting the governor with the tripping devices. Figs. 3 and 4 are enlarged detail views of the tripping devices, showing two positions of the same, and Fig. 5 is a sectional detail of the locking-latch.

Referring to Fig. 1, the numeral 1 indicates an oscillating plate, to which is attached the eccentric-rod of the engine and whose oscillations are imparted to two rocking steam-valves as follows: Rods 2 2 connect with elbow-cranks 3 3, each of which carries a pivoted steam-hook 3<sup>a</sup> and an arm 3<sup>b</sup>, rigidly connected to the steam-hook. The steam-hook 3<sup>a</sup> catches under a square lug 4 on the end of the valve-arm 5, and when the steam-hook is so engaged and is lifted it rocks the valve-arm and the valve. This valve-arm has a rod 6 attached to it and extending down to a dash-pot. (Not shown.) When the steam-hook 3<sup>a</sup> is knocked off the square lug 4, the dash-pot rod 6 pulls down the arm to give the cut-off action to the valve, as in the ordinary Corliss steam-engine.

On the same axis with the valve is mounted the rocking knock-off cam-lever 8, which has the usual knock-off cam 7, and an additional safety knock-off cam 7<sup>a</sup> is provided in accordance with our invention. When the cam-lever 8 is rocked in normal running, the

cam 7 strikes arm 3<sup>b</sup> and pushes steam-hook 3<sup>a</sup> off the lug 4 to give the usual cut-off, and when an emergency stop of the engine is required the cam 7<sup>a</sup> is brought against arm 3<sup>b</sup> to permanently hold the steam-hook 3<sup>a</sup> away from lug 4, and thus stop the action of the valve entirely. The means by which this is done consists of the two rods 9 9, connected to the opposite ends of the lever 10, fixed to the end of a sleeve 10<sup>a</sup>, (see Fig. 5,) having at its other end a rigid collar 11 with a keyway-slot cut in its outer face parallel to the axis. An elbow-lever 13 is pivoted to a stationary collar 12, and its lower arm lies normally in a slot in collar 12 and in the slot of the collar 11, locking the collars 11 and 12 together; but if this lever is lifted out of the slot in collar 11 then the sleeve 10<sup>a</sup> and lever 10 may turn, and this it does in response to a weighted arm 20, Fig. 1, which has the effect of moving the rods 9 9 and bringing the knock-off cams 7<sup>a</sup> into position for permanently stopping the engine by throwing out the steam-hooks 3<sup>a</sup>.

To unlock the latch formed by elbow-lever 13, the upper arm of the same is formed with a cross-head that is adapted to be struck (see Figs. 3 and 4) by a tappet-arm 14, hinged to a suitable framework on the governor-standard. This tappet-arm has a laterally-projecting pin 16, which is caught by the hooked and bevel-faced end of a lever-catch 17. The arm 14 is thrown forcibly down by a U-shaped spring 15 and when released from the catch 17 strikes the cross-head of elbow-lever 13 and lifts the locking-latch out of the keyway, as seen in Fig. 3.

The outer end of lever-catch 17 is held down into engagement with the pin 16 by spring 17<sup>a</sup>, as seen in Fig. 4, and the other end of the lever 17 is connected to a solenoid-core 18, (see Fig. 2,) which plays up and down within a solenoid 19. The terminals of this coil are attached to the circuit-wires C, which include a battery A, and which circuit-wires extend to two terminal contact-plates c c on opposite sides of the governor-standard. A contact-disk b slides vertically on the governor-standard and is attached to the sleeve of the governor-balls, so that when the governor-balls rise from an excessive speed disk b comes into contact with terminal plates c c and closes the electric circuit of bat-



tery A, with the result that the solenoid is energized, the core 18 drawn down into the same, and the latch 17 released from the tappet-arm 14, which is then free to respond to the spring 15 and unlock the latch 13 and stop the engine in the manner before described.

On the disk *b* are arranged a stack of detachable weights *b'*, which may be increased or diminished to cause the engine to be cut out at any predetermined speed.

The circuit-wires C C are extended through the plant, and at suitable convenient points short-circuiting push buttons or keys P are arranged, so as to permit the solenoid to be energized at will from any desired point in the plant, as may be rendered necessary or desirable in any emergency. These circuit-wires may be extended in the form of branch wires C' C' and push-buttons P' to the various offices or other points more or less remote from the plant.

We claim—

1. An engine stop device comprising means for rendering the engine inoperative, a lever with one or more rods connected thereto, means for tilting the lever, a collar with locking-slot, a latch fitting in said slot, and electromagnetic means for releasing the latch.

2. An engine stop device, comprising a valve-gear with steam-hooks and knock-off cam-levers, two rods connecting with the latter, a tilting lever fulcrumed in the center and having its ends connected to the rods, a slotted collar connected to the tilting lever, a

locking-latch for the slotted collar and electromagnetic means for releasing the latch.

3. An engine stop device, comprising mechanical means for throwing the engine out of gear, a tripping device for setting this into action, an electromagnetic device for the tripping devices and a battery-circuit with circuit-closer connected with and operated by the governor.

4. A steam-engine having knock-off cams for the steam cut-off, combined with a stop device operating through the knock-off cams, said stop device consisting of a tripping mechanism, an electromagnetic releasing device for the tripping mechanism and a circuit with circuit-closer.

5. A steam-engine having an automatic cut-off, an automatic governor regulating the same and an electromagnetic stop device acting through the cut-off mechanism.

6. A stop mechanism comprising a valve-gear, two rods, a centrally-hung lever with opposite ends connected to said rods and provided with means for tilting it and a slotted collar, a locking-latch for the collar having an elbow extension, a swinging tappet-bar arranged to strike the latch, a catch-lever engaging the tappet and electromagnetic means for releasing the catch.

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