

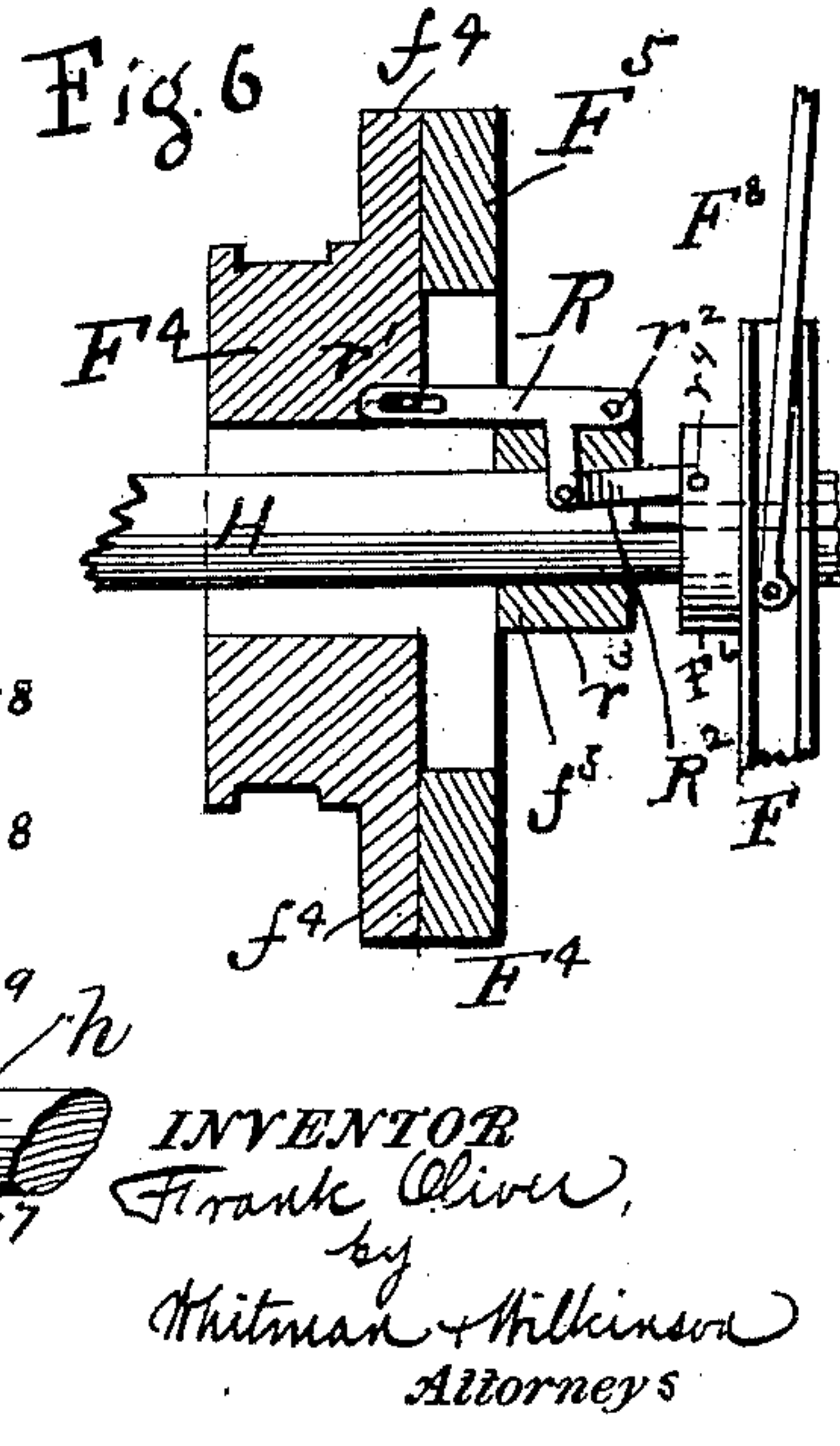
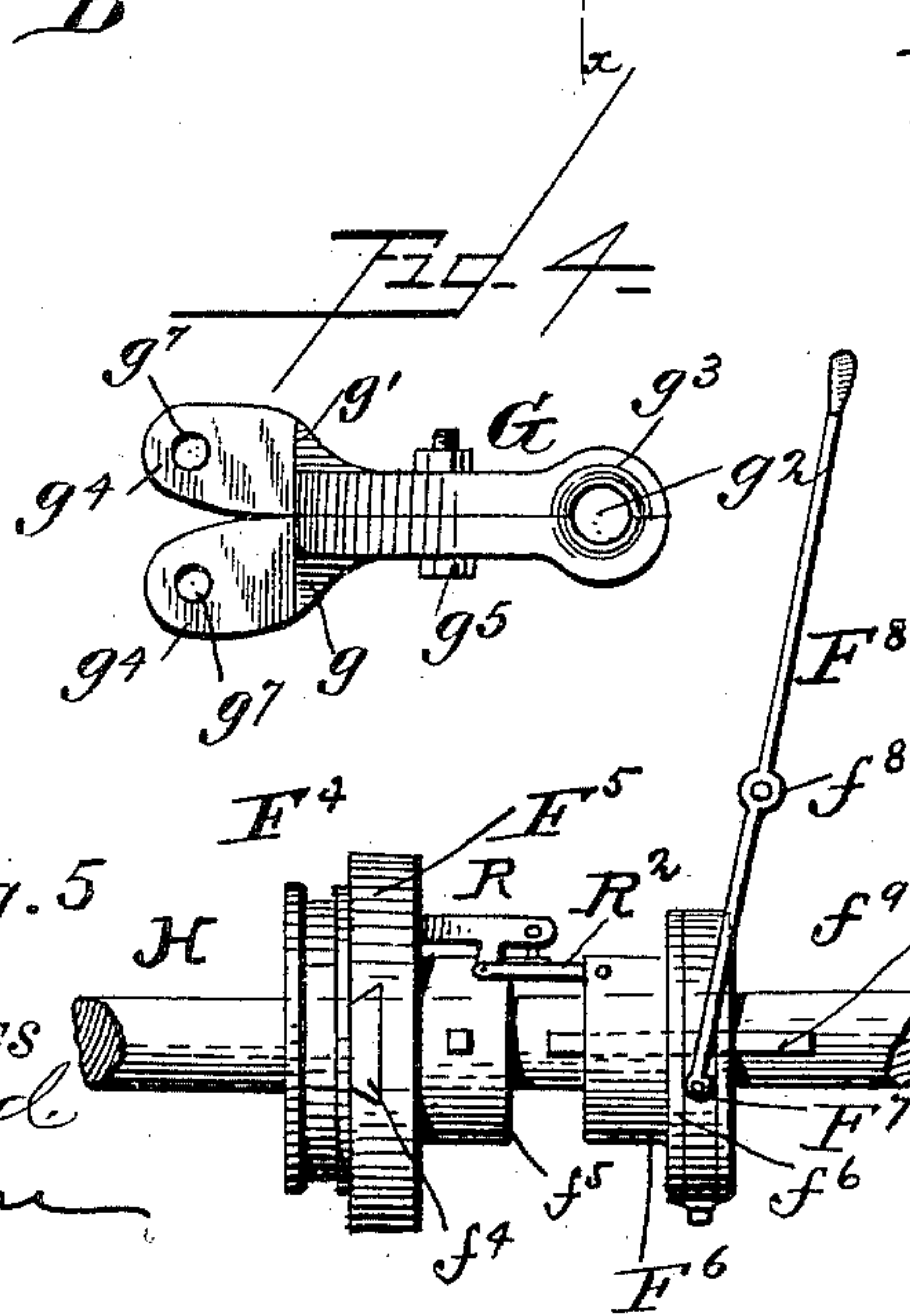
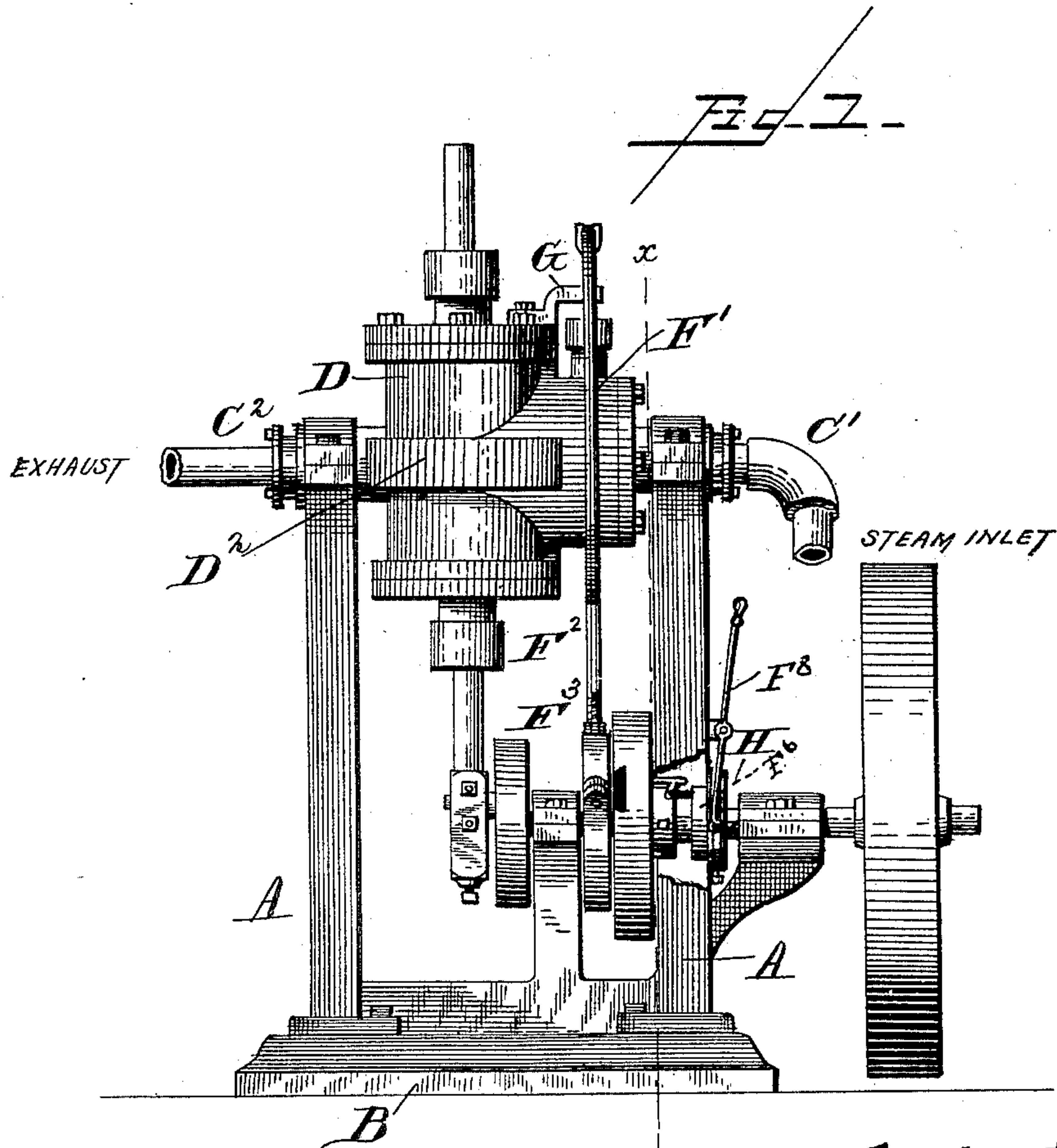
(No Model.)

2 Sheets—Sheet 1.

F. OLIVER.
OSCILLATING STEAM ENGINE.

No. 467,766.

Patented Jan. 26, 1892.



WITNESSES
J. L. Ourand
J. C. Wilson

INVENTOR
Frank Oliver
by
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Attorneys

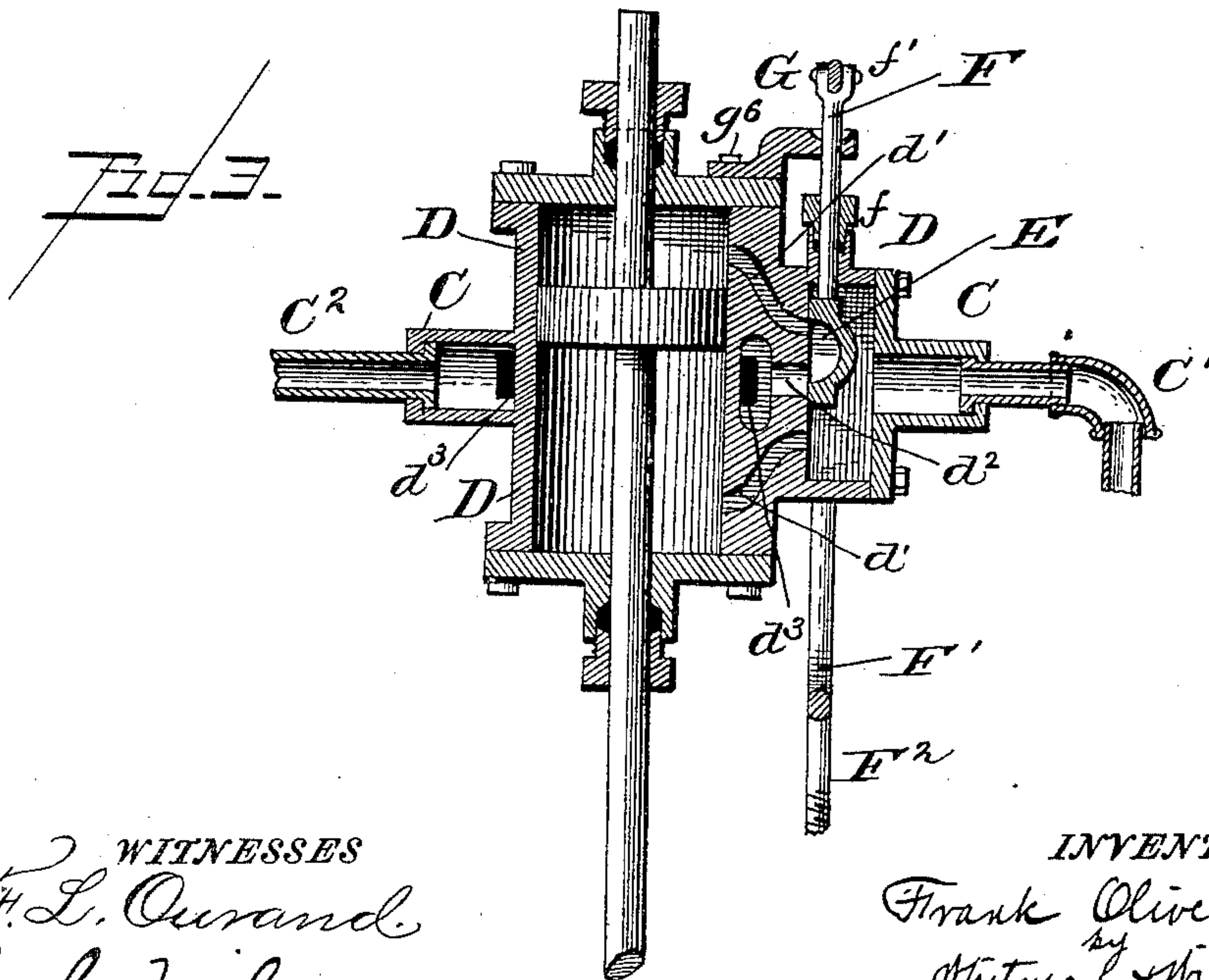
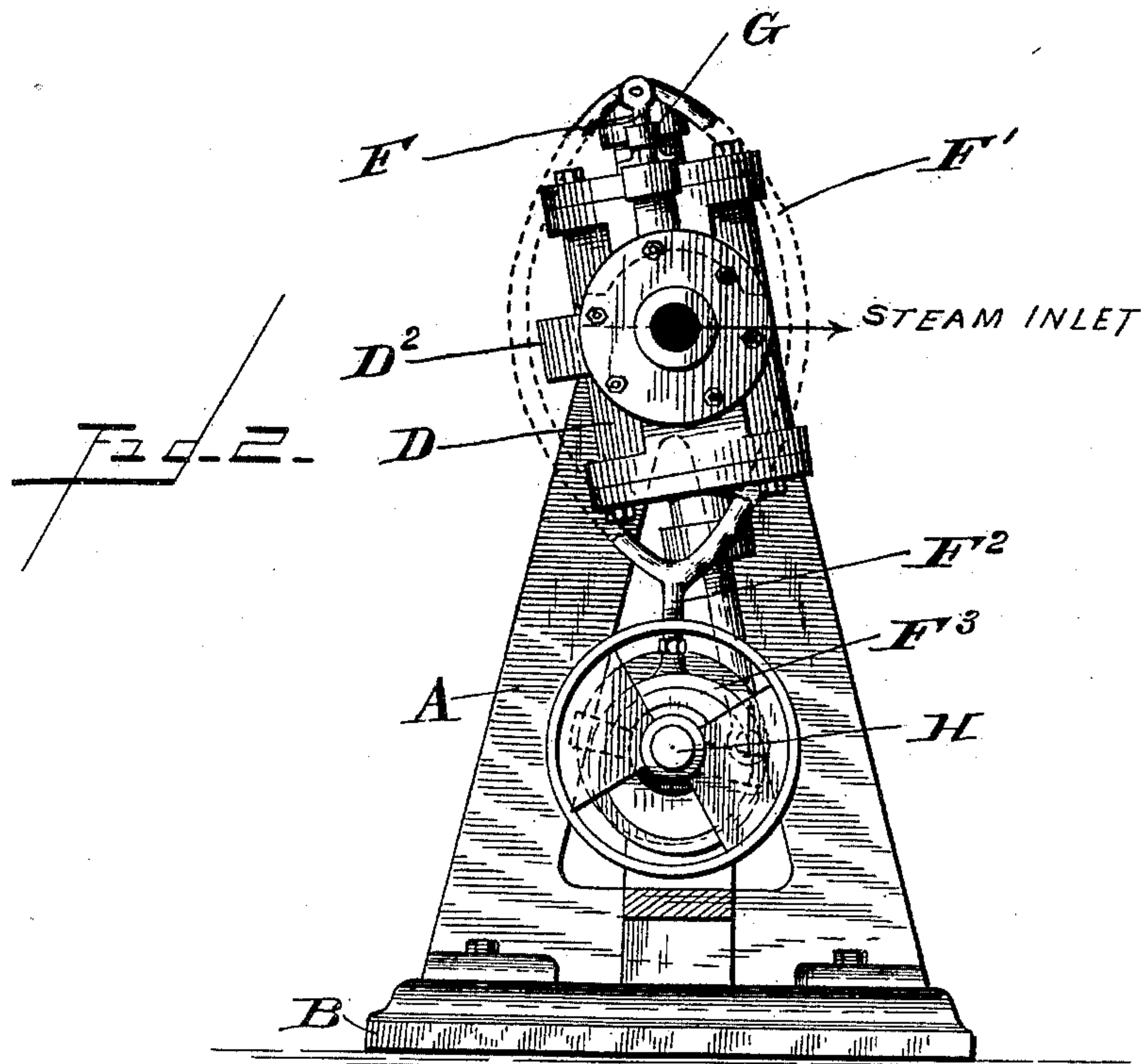
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UNITED STATES PATENT OFFICE.

FRANK OLIVER, OF ECONOMY, PENNSYLVANIA.

OSCILLATING STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 467,766, dated January 26, 1892.

Application filed June 18, 1891. Serial No. 396,738. (No model.)

To all whom it may concern:

Be it known that I, FRANK OLIVER, a citizen of the United States, residing at Economy, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Oscillating Steam-Engines; 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.

My invention relates to oscillating steam-engines; and it consists of certain novel features herein described and claimed.

Reference is had to the accompanying drawings, wherein the same parts are indicated by the same letters.

Figure 1 represents a side elevation of the engine. Fig. 2 represents a section along the line xx of Fig. 1, looking to the left. Fig. 3 represents a section through the plane, including the axis of the cylinder and that of the trunnions. Fig. 4 represents the guide for the valve-stem to take the wear off the gland. Fig. 5 represents a side elevation of the device for shifting the eccentric. Fig. 6 represents a view of the same, partly in section, along the axis of the shaft.

The frame A is mounted on the bed B and supports the hollow trunnions C of the cylinder D.

D' is the steam-chest, which is either bolted to or cast integral with the cylinder D. This steam-chest contains the ordinary slide-valve E, connected to the valve-stem F. The ports d' lead from the steam-chest to the cylinders, as usual, while the exhaust-port d^2 communicates with a passage d^3 , which is contained in the shell of the cylinder beneath the ribs D². The steam entering the steam-chest from the pipe C' and hollow trunnion adjacent thereto passes into the cylinder through the steam-port, while the exhaust-steam passes through its port, the exhaust-port d^2 , the passage d^3 in the shell of the cylinder, and leaves the opposite trunnion by the pipe C².

The valve-rod F passes through the stuffing-box f and guide G, and is attached at f' to the yoke F', which is connected by the rod F² to the eccentric-strap F³. The valve-rod is mounted on the opposite side of the oscillat-

ing cylinder from the shaft H in order that the maximum angle between the piston and eccentric rods may be made as small as possible. The yoke F' and guide G are both supplied, in order to prevent too great lateral pressure on the gland f , due to the varying and unavoidable angularity of the eccentric-rod with the piston-rod. This guide G consists of two separate symmetrical pieces g and g' , each having rounded shoes g^4 , held firmly on the top of the piston-head by screws g^6 , passing freely through holes g^7 in the said shoes. The outer ends of these pieces g and g' come together snugly, forming a cylindrical hole g^2 , through which the valve-stem passes, surmounted by a cup-shaped cavity g^3 for the reception of oil or other lubricants. The screw-bolt g^5 holds the two pieces g and g' firmly together. When it is desired to take out the gland f for any reason, by taking out the bolt g^5 and swinging the parts g and g' back on the pivots g^6 the gland may be readily reached.

In order to provide for reversing, which will be necessary whenever the herein-described engine is adopted for use as a marine-engine and for the various other applications of the engine in which reversing becomes desirable, I have the devices illustrated in Figs. 5 and 6, wherein F⁴ represents the eccentric in the form of a hollow ring loosely inclosing the shaft H, but set at some distance therefrom.

F⁵ represents a disk partially open to the rear and having a dovetail slot in the face thereof, in which the slide f^4 engages. This slide is either rigidly attached to or integral with the eccentric. The disk F⁵ has a hub f^5 keyed to the shaft H. A collar F⁶ moves longitudinally on the shaft H, but is held against turning by means of a stud or lug engaging in the groove h in the shaft H. On one end of this collar F⁶ a loose collar F⁷ is fitted, held between the flanges f^6 . To this loose collar F⁷ the hand-lever F⁸, with fixed pivot f^8 , is attached. The rod R, having the arm r , is slotted at r' , where it is pivoted to the slide f^4 . At r^2 it is pivoted to the hub f^5 , keyed on the shaft H, and at r^3 to the rod R², pivoted at r^4 to the sliding collar F⁶. It will be seen when the lever F⁸ is moved to the right that the sliding collar F⁶ will be forced to the left

and the connecting-rod R^2 will push back the arm r and throw up the slotted arm r' , which carries the slide f^4 and eccentric F^4 along with it. By moving the lever F^8 in the opposite direction the eccentric will be lowered or the engine reversed. It will be seen that the lever F^8 will move the eccentric irrespective of the position of the valve in the steam-chest.

10 This device for shifting the eccentric will be claimed in a divisional application.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

15 1. In an oscillating steam-engine, the combination, with a main shaft, of a cylinder having the two hollow trunnions and a steam-chest and exhaust-passage connected to the said trunnions, a slide-valve working in said steam-chest, a valve-rod moving in suitable guides connected to said valve on the opposite side from the said shaft, a yoke inclosing

the said steam-chest connected to said valve-stem, and an eccentric rod and strap connected to an eccentric on said shaft, with means for shifting said eccentric, substantially as described. 25

2. In an oscillating steam-engine, the combination, with the cylinder D , having ports d , d' , and d^2 , exhaust-passage d^3 , and hollow trunnions C , of the steam-chest D' , a slide-valve contained therein, the valve-rod F , connected to said slide-valve, the guide G , having two hinged arms bolted together, for said valve-rod, the yoke F' , connected to said valve-rod, and the eccentric-rod, eccentric-strap, and eccentric connected to said yoke, substantially as described. 30 35

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

FRANK OLIVER.

Witnesses:

H. FISCHERN,
D. B. TURNER.