

(No Model.)

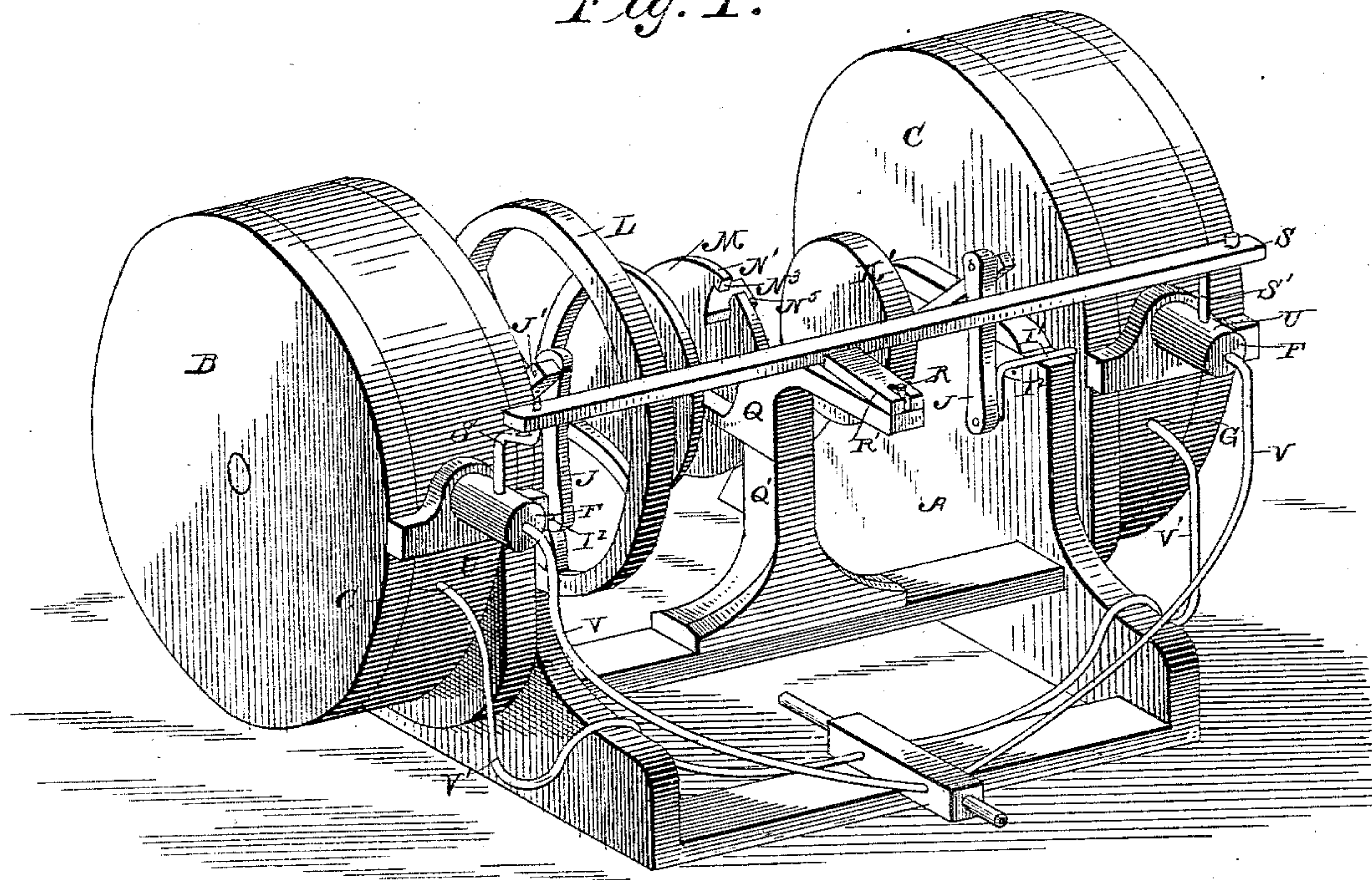
2 Sheets—Sheet 1.

G. A. PICKUP.  
ROTARY STEAM ENGINE.

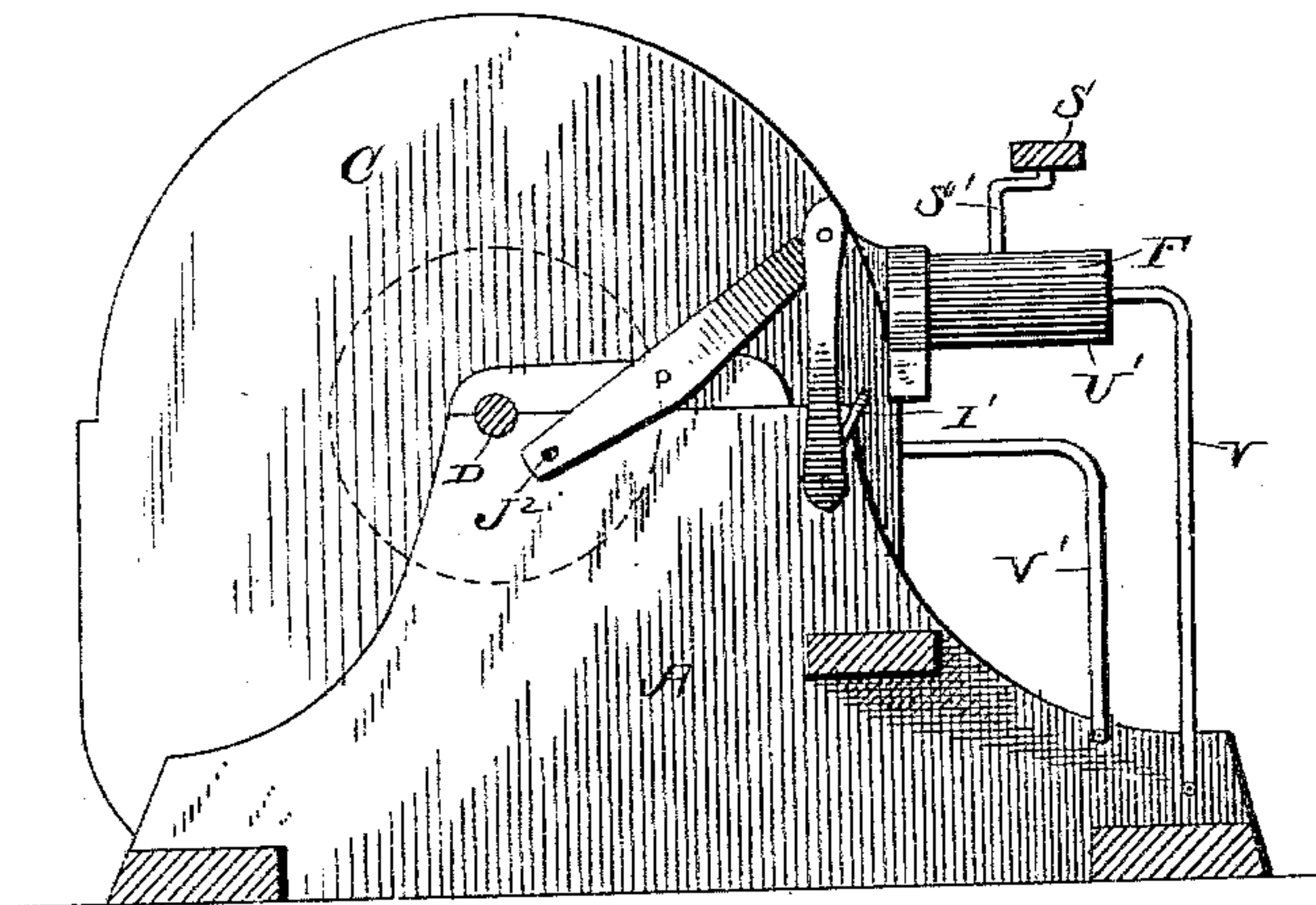
No. 318,794.

Patented May 26, 1885.

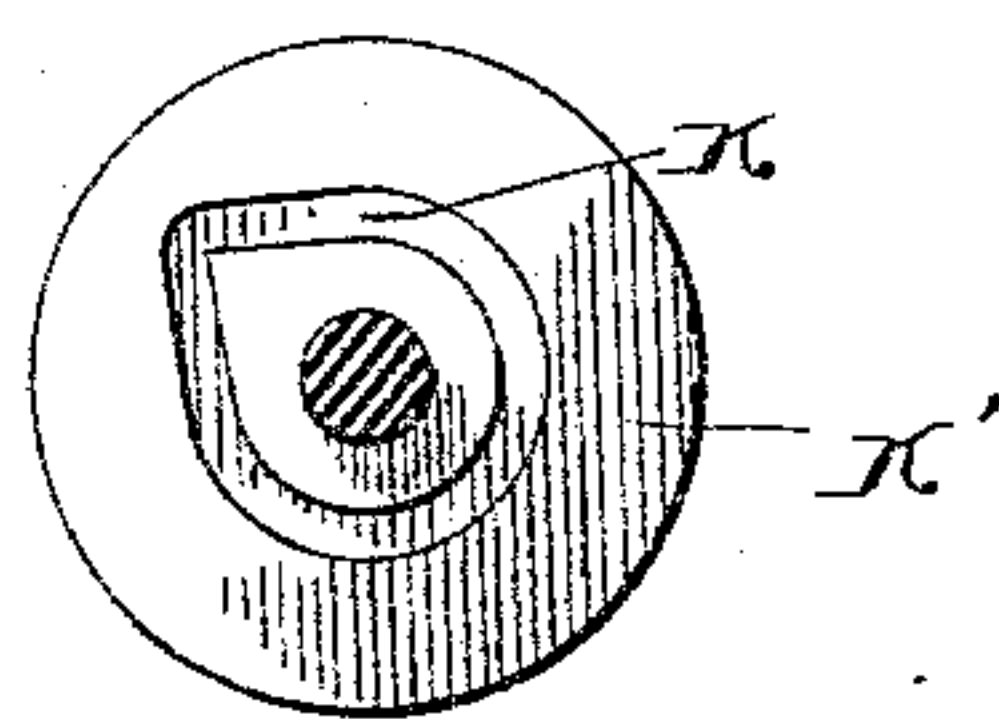
*Fig. 1.*



*Fig. 3.*



*Fig. 7.*



WITNESSES

*W. W. Mortimer*  
*Edward G. Siggers*

*Geo. A. Pickup*  
INVENTOR

*by C. A. Snow & Co.*  
Attorneys



(No Model.)

2 Sheets—Sheet 2.

G. A. PICKUP.  
ROTARY STEAM ENGINE.

No. 318,794.

Patented May 26, 1885.

Fig. 4.

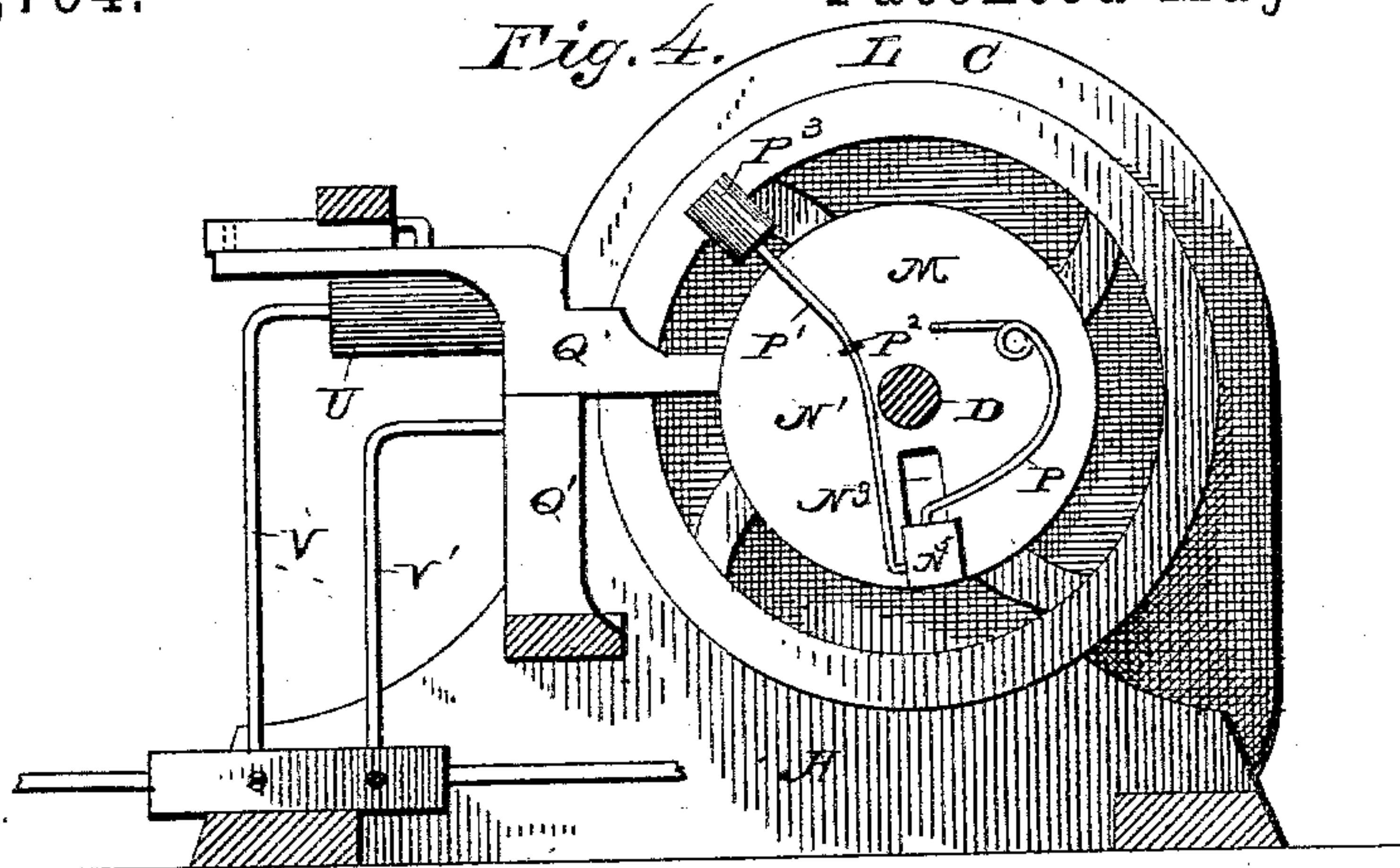


Fig. 5.

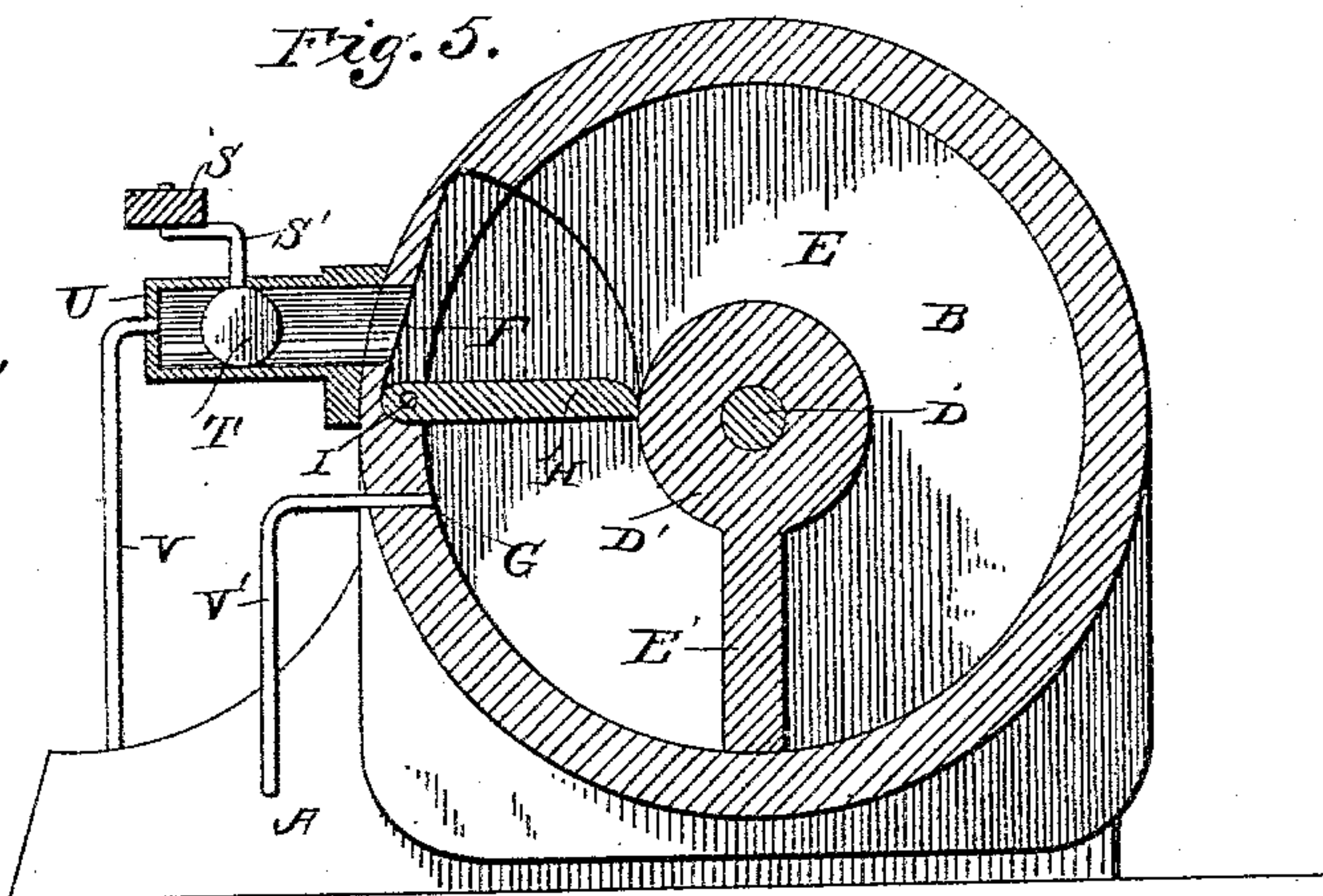


Fig. 6.

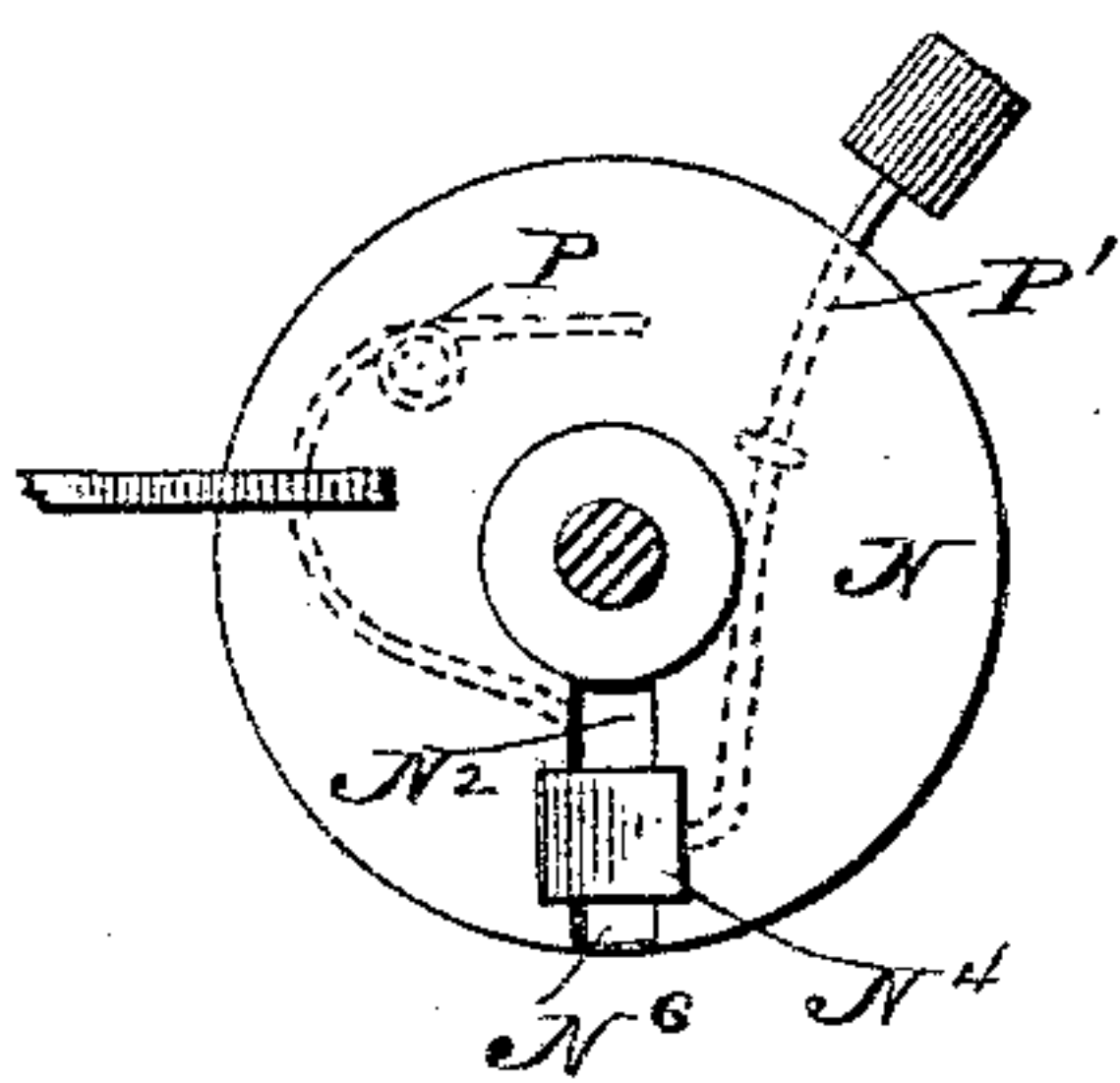
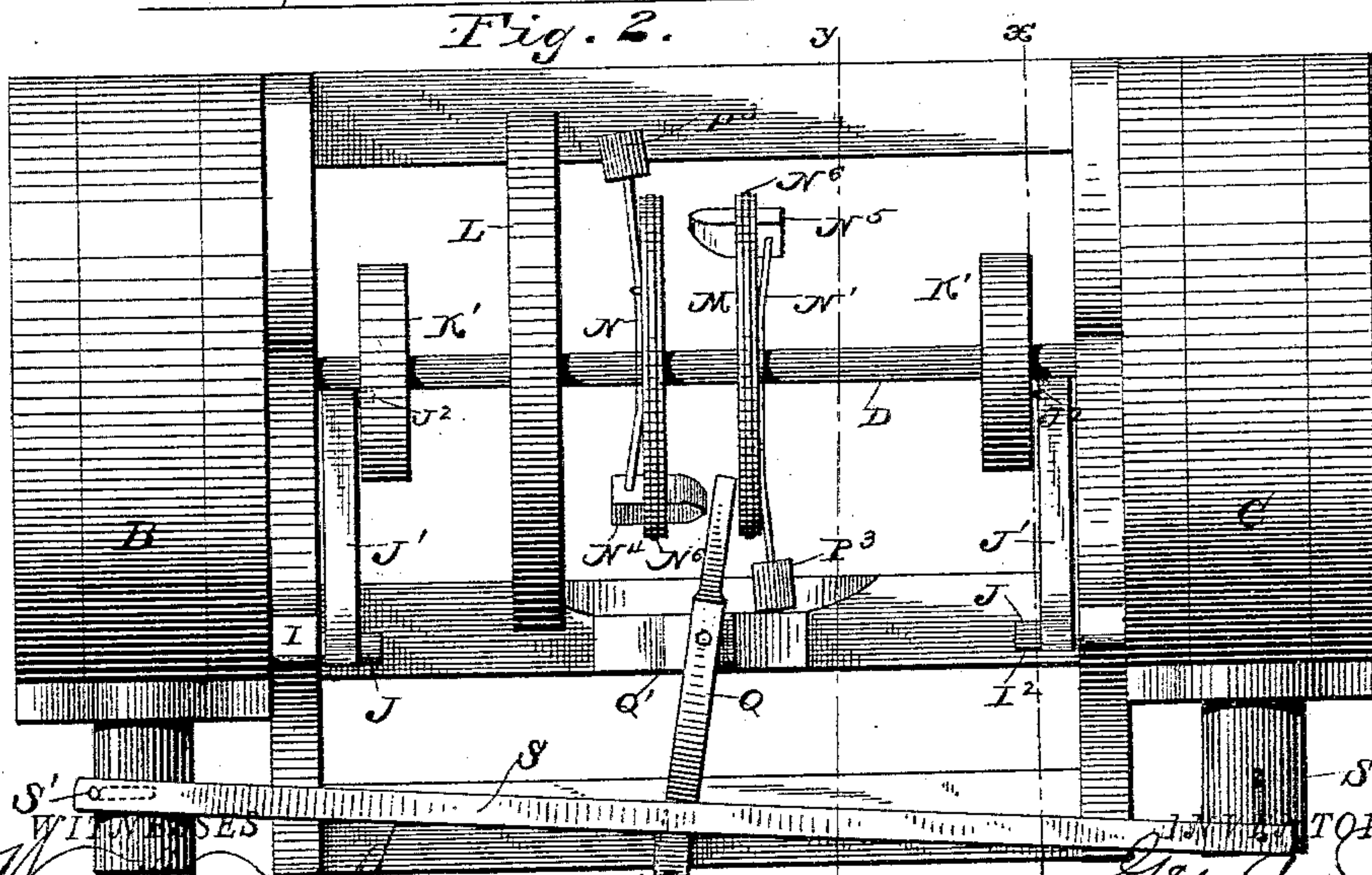


Fig. 2.



*E. G. Siggers.*

*Geo. A. Pickup*  
*by C. A. Snow & Co.*  
*Attorneys*



# UNITED STATES PATENT OFFICE.

GEORGE ALEXANDER PICKUP, OF SHELBYVILLE, TENNESSEE.

## ROTARY STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 318,794, dated May 26, 1885.

Application filed December 4, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE A. PICKUP, a citizen of the United States, residing at Shelbyville, in the county of Bradford and State of Tennessee, have invented a new and useful Improvement in Rotary Steam-Engines, of which the following is a specification, reference being had to the accompanying drawings.

My invention has relation to rotary steam-engines; and it consists in the construction and novel arrangement of parts, as will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a view in perspective of a steam-engine embodying my improvements. Fig. 2 is a plan view. Fig. 3 is a vertical longitudinal sectional view on line *x x* in Fig. 2. Fig. 4 is a vertical sectional view on the line *y y* in Fig. 2. Fig. 5 is a vertical sectional view through one of the steam-cylinders. Fig. 6 is a detail view of the governors. Fig. 7 is a detail view of one of the cam-wheels, showing the groove therein.

Referring by letter to the accompanying drawings, A designates the frame of the engine, to the opposite ends of which are secured the steam-cylinders B and C.

D designates the driving-shaft, which is common to both cylinders B and C. The driving-shaft D has its bearings in the ends of the frame A, and to these ends the cylinders B and C are securely bolted.

At each end the driving-shaft D is provided with a piston, located, respectively, within the cylinders B C. One of these pistons (designated by the letter E) is shown in Fig. 5 as arranged within the cylinder B, and as both of the pistons are alike in construction, it will not be necessary to give a detailed description and illustration of each. The said piston E consists of a hub, D', and a blade, E', the hub being rigidly secured to the end of the driving-shaft D within the cylinders B and C. Each cylinder has a steam-port, F, and an exhaust-port, G, between which ports a steam-valve, H, is hinged. The steam-valves H are sufficiently long to engage the hubs of their respective pistons when the valves are not in contact with the blades of the pistons, and also to close the steam-ports when turned up by the blades E'. The pistons E within the cylinders B C are se-

cured to the driving-shaft with their blades E' pointing in opposite directions, so that the valves H will be operated alternately as the shaft rotates.

The rods I I', which form the hinges for the valves H, have their bearings in the walls of the cylinders, and on their inner ends said rods are provided with cranks I<sup>2</sup>, which connect with the lower ends of arms J, the upper ends of which are pivoted to the upper ends of levers J', fulcrumed to the inner faces of the uprights of the frame of the machine. The levers J' are provided at their lower ends with pins J<sup>2</sup>, which extend laterally and inwardly therefrom and enter cam-grooves K in the cam-wheels K' on the driving-shaft D.

L designates the band-wheel, and near this and on the driving-shaft D is the governor M, which is of improved construction. The governor consists of two disks, N N', slotted and secured to the driving-shaft D a short distance from the band-wheel L. Within the slots N<sup>2</sup> N<sup>3</sup> of the disks N N' are two sliding tappets, N<sup>4</sup> N<sup>5</sup>, which are held normally out against the bands N<sup>6</sup>, with which the disks N N' are encircled, by springs P, connecting the tappets with the outer faces of the disks. Rods or arms P' are secured to the tappets outside of the disks, and pass through staples or guides P<sup>2</sup> in the outer faces of said disks, and are provided at their outer ends with the governor-balls P<sup>3</sup>. A lever, Q, is fulcrumed on a pedestal, Q', in front of the disks N N', and one end of it, which is triangular in cross-section, is extended between the disks N N', so that when the disks revolve the tappets N<sup>4</sup> N<sup>5</sup> will alternately strike the lever Q and oscillate it on its fulcrum. The other end of the lever Q is higher than the end between the disks, and is provided with a vertically-projecting stud or arm, R, which extends up within a recess in the arm R' of the valve-rod S. This valve-rod connects the cranks S' of the valves T in the steam-pipes U, and when the disks are revolved the tappets strike the lever Q and operate the valve-rod, and consequently the valves.

Steam enters the cylinders through the steam-pipes V, and escapes through the exhaust-pipes V'. As the speed of the engine increases, the governor-balls P<sup>3</sup> are forced out and draw with them the sliding tappets N<sup>4</sup> N<sup>5</sup>,



which causes the tappets to move in toward the center of the disks, where they will more frequently strike the lever Q and cause the supply of steam to be regulated.

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

10 1. The combination, with the steam-cylinders having the steam and exhaust ports and pipes and the hinged valve between the inlet and outlet, of the driving-shaft having pistons at the end located within the cylinders, and the cam-wheels K' K', the disks with sliding tappets, the oscillating lever, and the bar connecting the steam-valves, substantially as specified.

20 2. The combination, with the shaft of a rotary engine, of the disks arranged on said shaft, the spring-actuated tappets, the governor-balls, and rods connecting the latter with the tappets, as and for the purpose set forth.

25 3. The combination, with the cylinders having the hinged valves and the driving-shaft with the blades E' E', of the disks having the spring-actuated sliding tappets and governors, the oscillating lever Q, and the bar connecting the steam-valves, as set forth.

30 4. The combination, with the shaft of a rotary engine, of the governor-balls connected with the shaft so as to be actuated by the movement thereof, and sliding tappets operated by the movement of the balls, as and for the purpose set forth.

5. The combination, with the cylinders, steam-pipe V, and driving-shaft, of the valves H, for closing the steam-ports, cam-wheels located on the driving-shaft, and means, substantially as described, connecting the cam-wheels with the valves for operating the latter as the shaft rotates, for the purpose set forth.

6. The combination, with the steam-cylinder and the valves, of the operating-rods therefor, the driving-shaft carrying disks, the governor-balls, and the sliding tappets connecting with the latter and arranged to be drawn inward by the outward movement of the balls, as set forth.

7. The combination, with the steam-cylinders, the pipes for admitting steam to the same, and the valves within the pipes, of the operating-rod for the valves, the driving-shaft carrying the governor-balls, and means, substantially as described, actuated by the movement of the balls, whereby when the speed of the engine increases the balls will be automatically forced out and operate said means to increase the number of oscillations or movements of the valve-operating rod, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

GEORGE ALEXANDER PICKUP.

Witnesses:

W. B. OVERCAST,  
ERNEST COLDWELL.