

(No Model.)

L. O. HARRIS.
CUT-OFF GOVERNOR.

No. 473,743.

Patented Apr. 26, 1892.

Fig. 6.

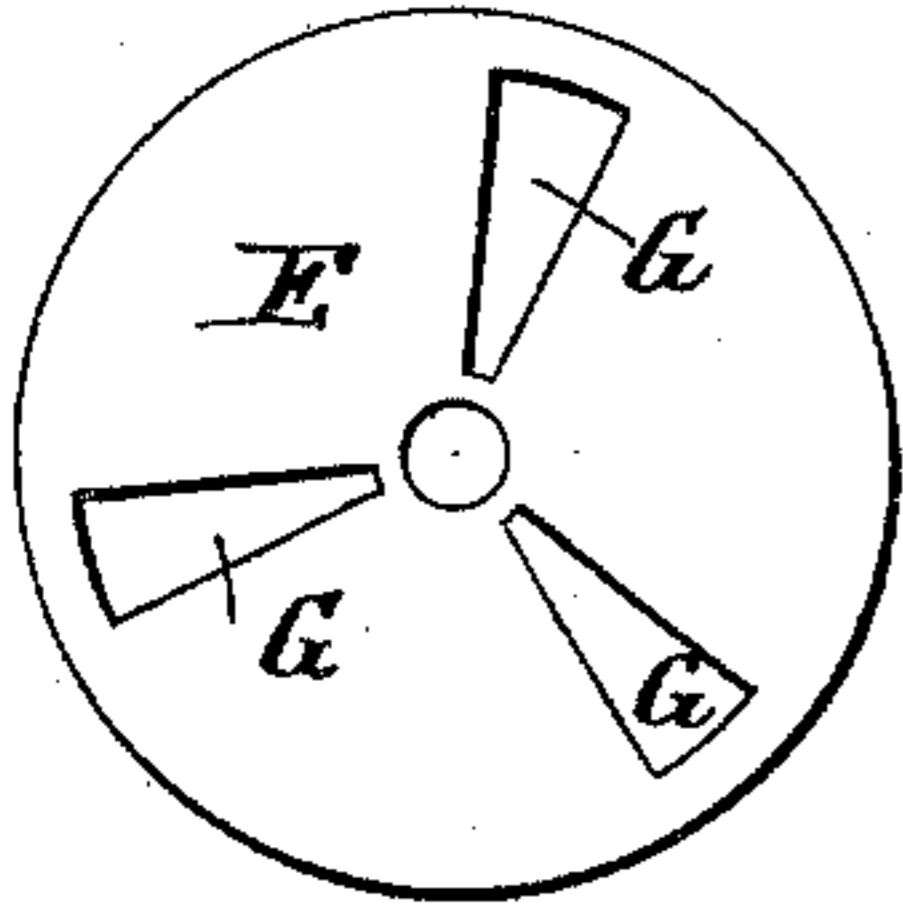


Fig. 5.

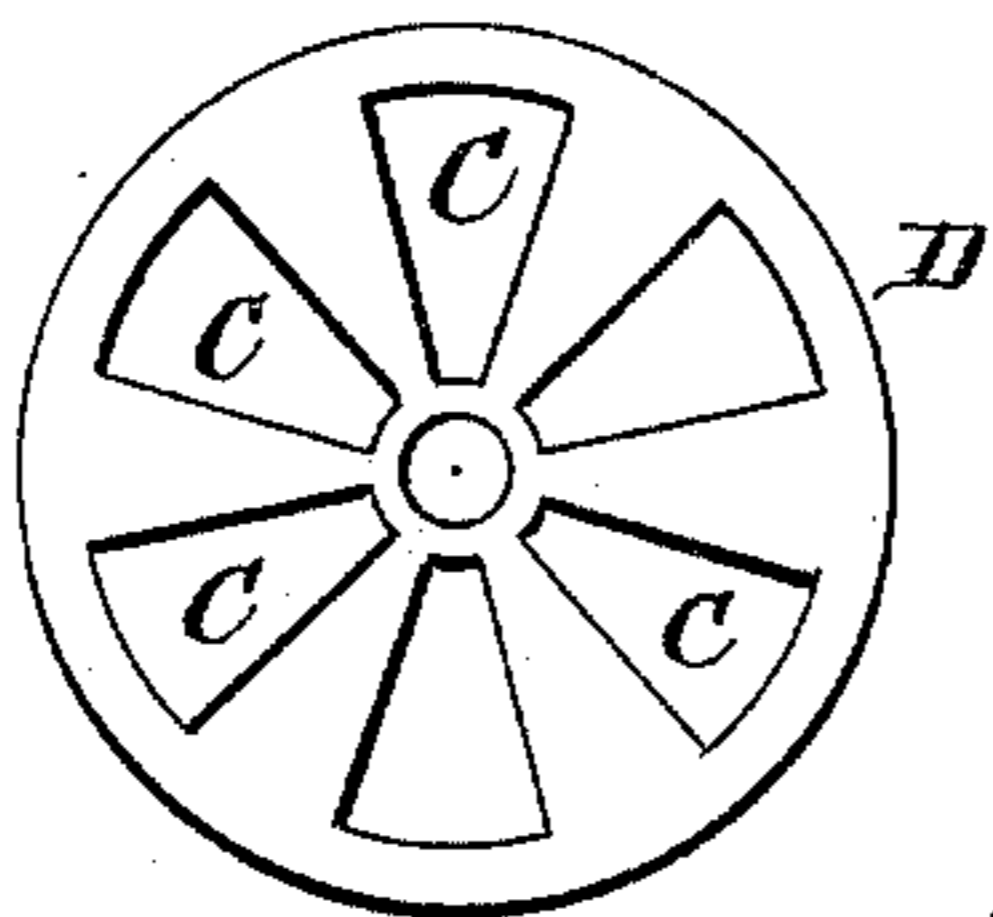


Fig. 4.

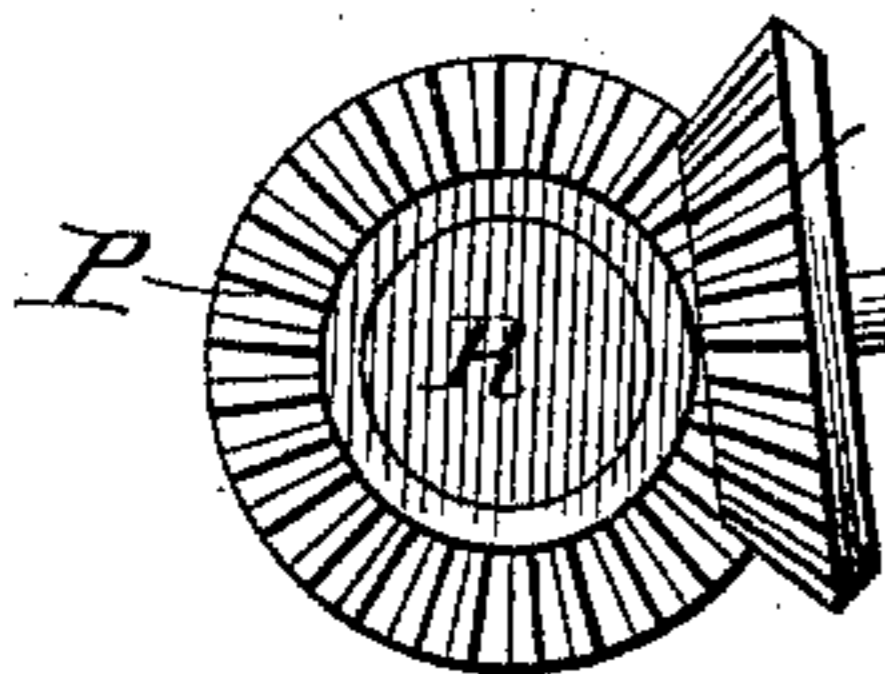
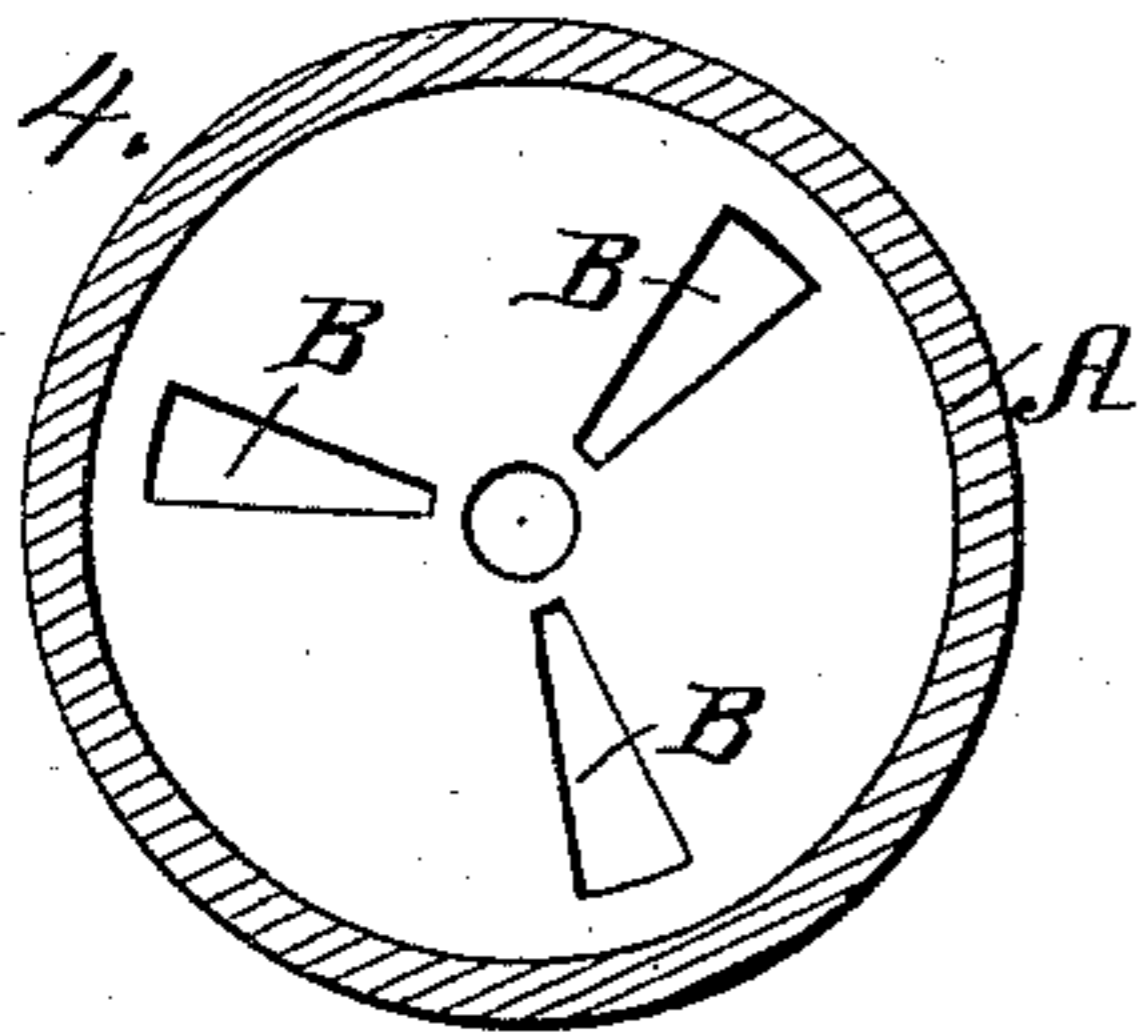


Fig. 1.

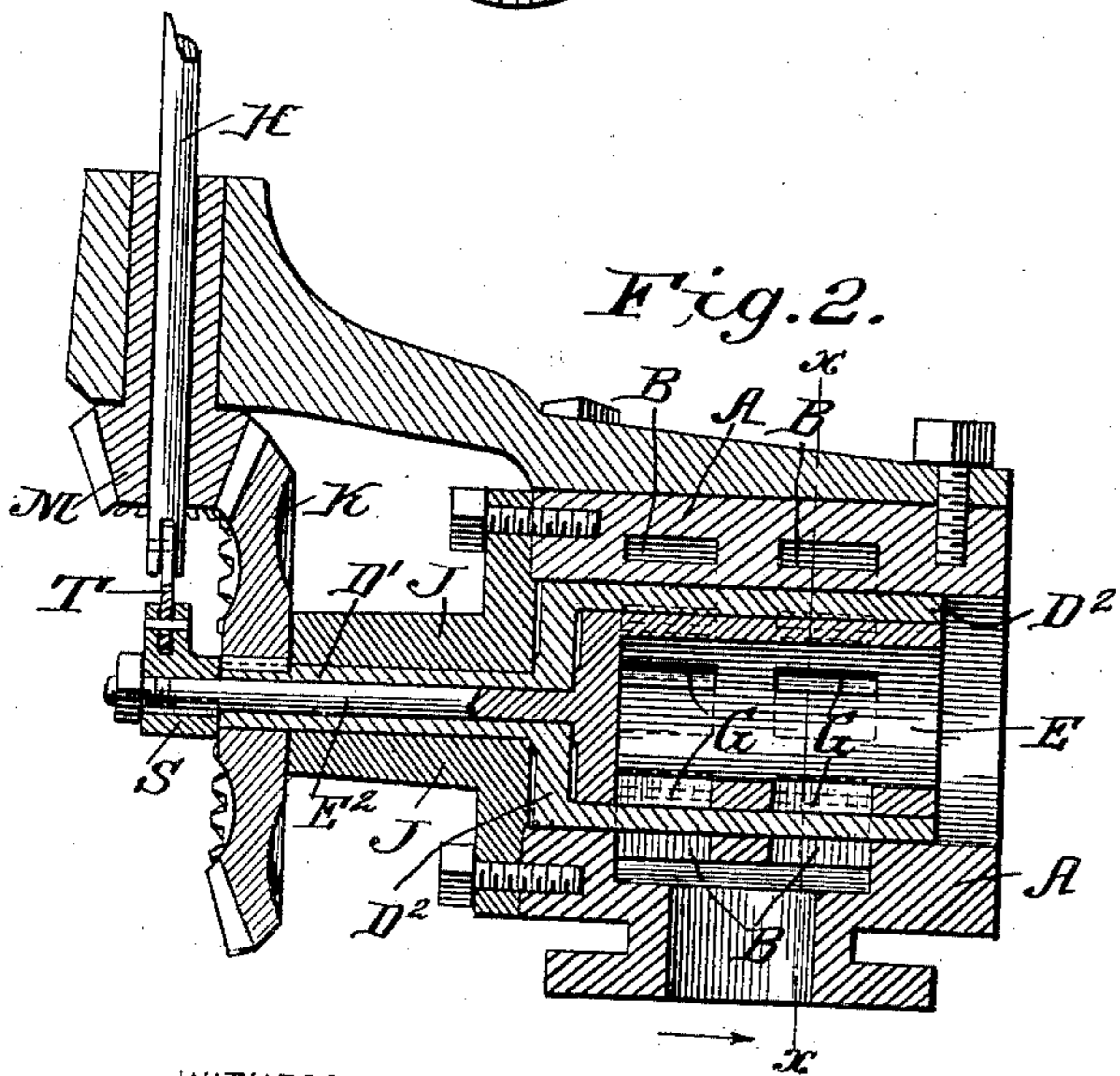
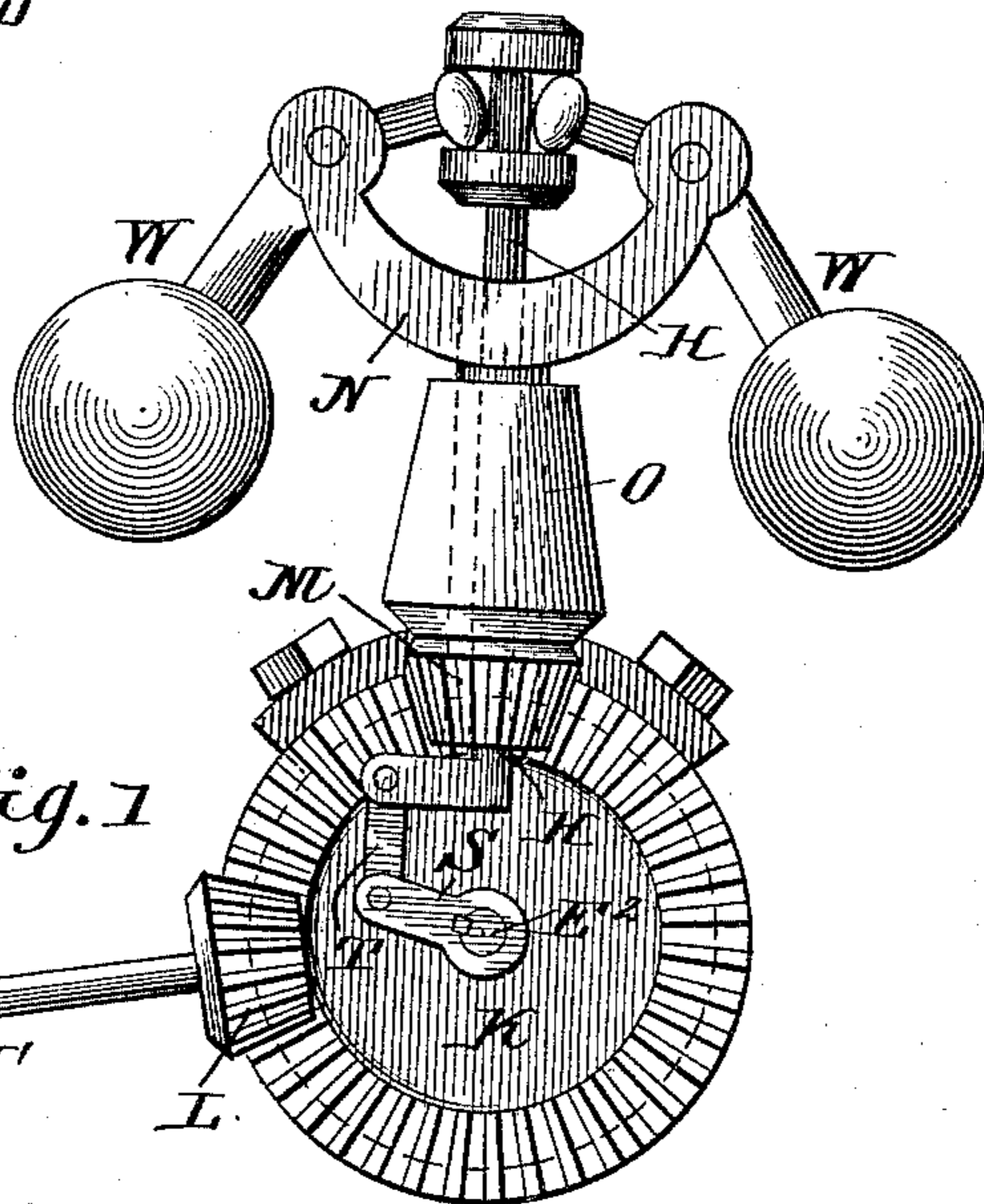
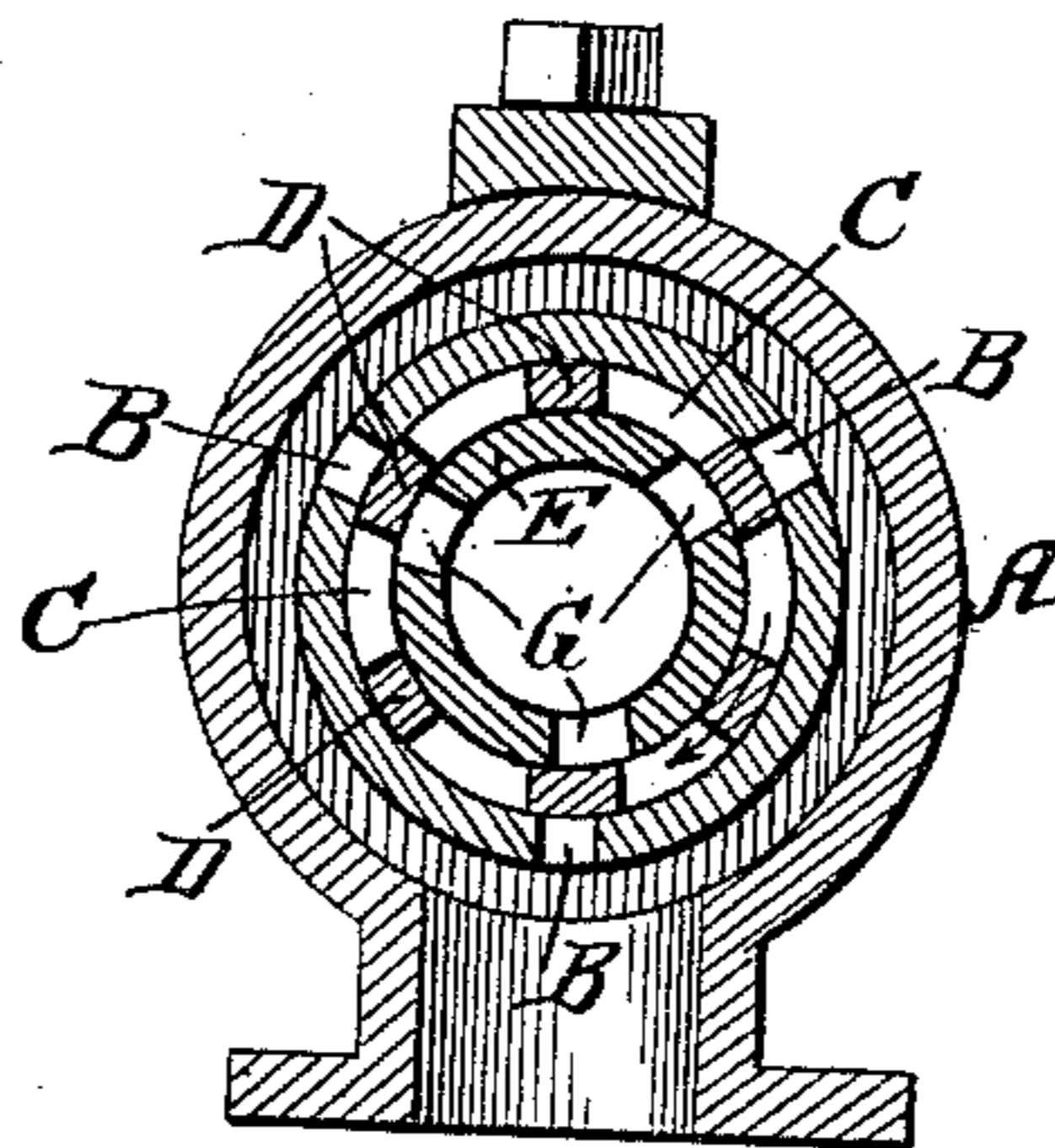


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

LEVI O. HARRIS, OF CADILLAC, MICHIGAN.

CUT-OFF GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 473,743, dated April 26, 1892.

Application filed May 8, 1891. Serial No. 392,115. (No model.)

To all whom it may concern:

Be it known that I, LEVI O. HARRIS, of Cadillac, in the county of Wexford and State of Michigan, have invented a new and useful
5 Improvement in Automatic Cut-Off Governors, of which the following is a specification.

The object of my invention is to provide an automatic cut-off governor for steam-engines designed to secure an economy of fuel and the
10 more steady running of the engine; and it consists in the peculiar construction and arrangement of parts, which I will now proceed to fully describe, reference being had to the accompanying drawings, in which—

15 Figure 1 is a side elevation of the governor, showing the gearing for connecting it with the main drive-shaft. Fig. 2 is a vertical longitudinal section. Fig. 3 is a vertical transverse section taken on line *xx* of Fig. 2; and
20 Figs. 4, 5, and 6 are details of a modification.

In the drawings, A A represent the cylindrical casing having an annular chamber and formed with ports B B B, opening from this annular chamber to the interior. Within this
25 casing there revolves a closely-fitting sleeve D², having on its periphery bars or valve surfaces D and alternating spaces or openings C. Within this revolving sleeve D² there oscillates another closely-fitting sleeve E, which has
30 ports or openings G, corresponding in number and position to the ports B B of the case. The sleeve D² has a smaller sleeve D', that extends through a tubular bearing J, which forms the head of the outer casing, and this smaller
35 sleeve D' is rigidly connected to a bevel gear-wheel K. The inner concentric sleeve E has a shaft E², which extends through the sleeve D' and wheel K and has attached to it outside the wheel K a crank-arm S. This
40 crank-arm S is connected by a link T to the vertical slide-rod H, which has a swiveling connection at its upper end with the ends of the governor-levers W. These governor-levers are fulcrumed in the branches N at the
45 upper end of a revolving sleeve, which latter turns in a bearing O and at its lower end has a bevel-pinion M, that derives motion from the bevel gear-wheel K. The bevel-gear K is rotated by a bevel-pinion L on the end
50 of a counter-shaft N', which at its other end is geared to the main shaft R by the bevel or miter wheels P Q.

The casing A is flanged at its base and is designed to sit upon the steam-chest, with which it communicates, and the end of the casing is adapted to receive a coupling, through
55 which it takes steam from a steam-pipe.

The operation of the governor is as follows: Motion being imparted to the gear-wheel K, it causes the sleeve D' D² to revolve continuously, and its openings C serve as they pass the ports B of the casing and G of the inner sleeve to admit the steam from the interior of said sleeve to pass to the annular chamber around the sleeve and thence to the steam-
60 chest below. As shown, there are twice as many openings C in the sleeve D² that there are ports B. This is because the engine cuts off twice to one complete revolution of the engine-shaft, and if there are three ports in case
65 A and six valves or openings C in sleeve D the engine-shaft will make three revolutions to one of the sleeve D. In other words, divide the number of openings in sleeve D by two, and that will give the number of revolutions
70 the engine-shaft will make to one of the sleeve D. The object of the extra valves in D is to act with the cut-off E, and the number of these ports may be greater or less than those shown.

For the normal operation of the governor
75 the steam passes from the inner sleeve to the outer casing through the registering openings G C B, the openings C traveling continuously in one direction. Now if the machinery starts to run at too high a speed from being relieved
80 of its work or through other cause the governor-balls are lifted in the well-known way, the slide-rod H is forced down, and the crank S is turned and made to throw the shaft E² of sleeve E with a rotary adjustment that causes
85 the ports G to be thrown more out of registration with B, so that the openings C of the revolving sleeve remain for a shorter time in registration with ports G and B, or, in other
90 words, cut off steam at an earlier point in the stroke of the piston. This economizes steam, allowing it to be used expansively in the piston-cylinder, and avoids the loss of power, which would otherwise be expended in an accelerated speed. When the speed or power
95 falls below the normal, the balls of the governor drop again and the inner sleeve E is shifted in the opposite direction, which causes the ports G C B to enter into coincidence al-
100

ways at the same time and remain in coincidence longer.

As a modification of the invention the ports can be placed in the end or ends of the case, as shown in Figs. 4, 5, and 6, the valves working as disks or heads, as shown; but the most convenient way is through the periphery of the case, as in Figs. 2 and 3.

Having thus described my invention, what I claim as new is—

The combination of the case A, having a chamber and ports on its inner surface, the revolving sleeve or head D, with openings C

and extension D', the inner sleeve E, with ports G, and shaft E², passing through sleeve or head extension D', the gear-wheel K, attached to extension D', the governor-sleeve N, having pinion M, and the slide-rod H, link T, and crank S, connecting with the oscillating shaft E², substantially as shown and described.

LEVI O. HARRIS.

Witnesses:

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