

(No Model.)

2 Sheets—Sheet 1.

G. B. RAIT.

CUT-OFF VALVE GEAR.

No. 388,304.

Patented Aug. 21, 1888.

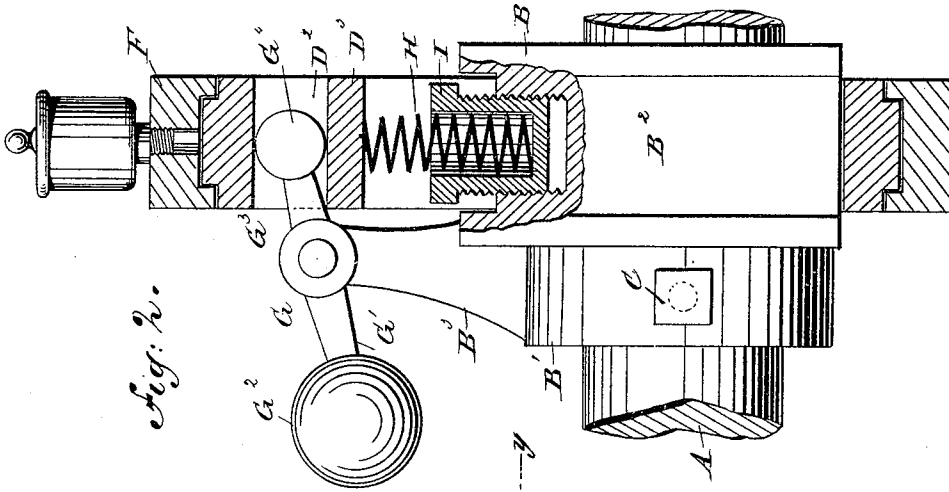


Fig. 2.

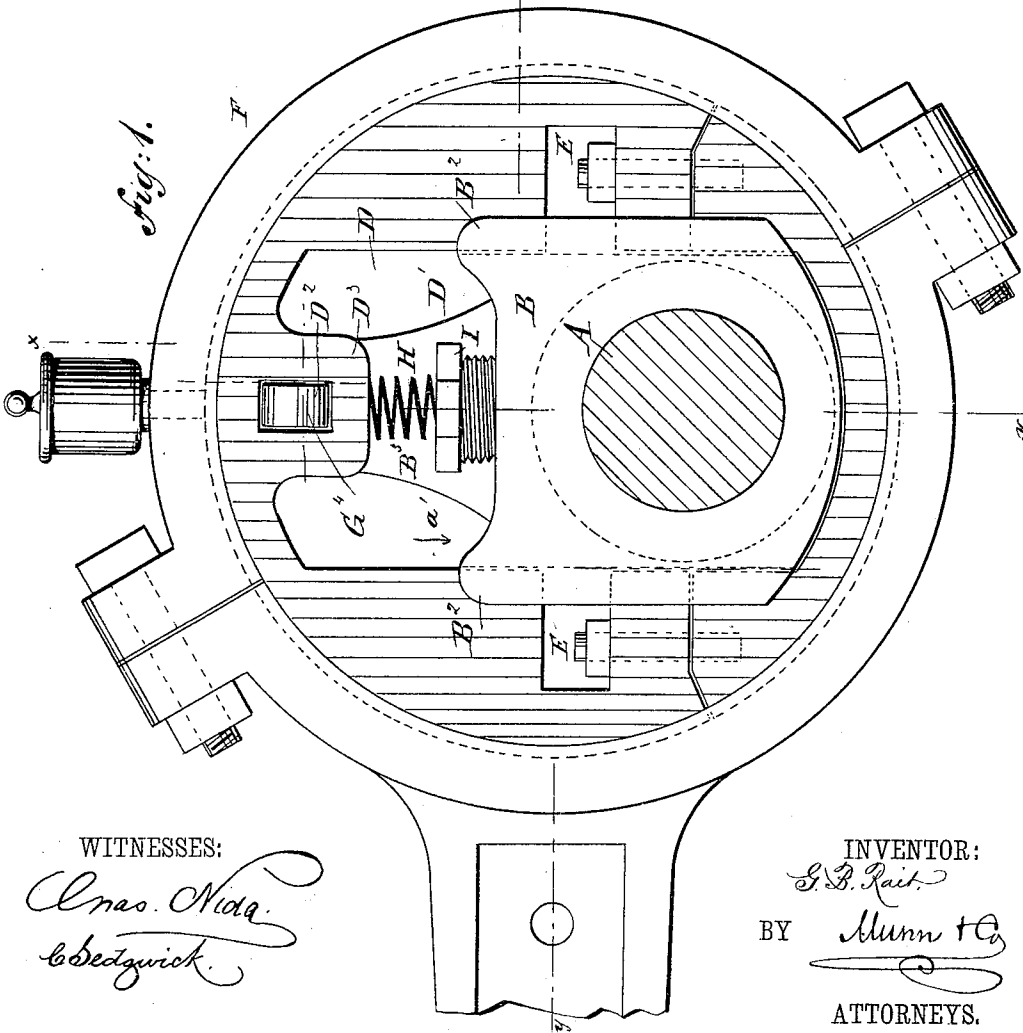


Fig. 1.

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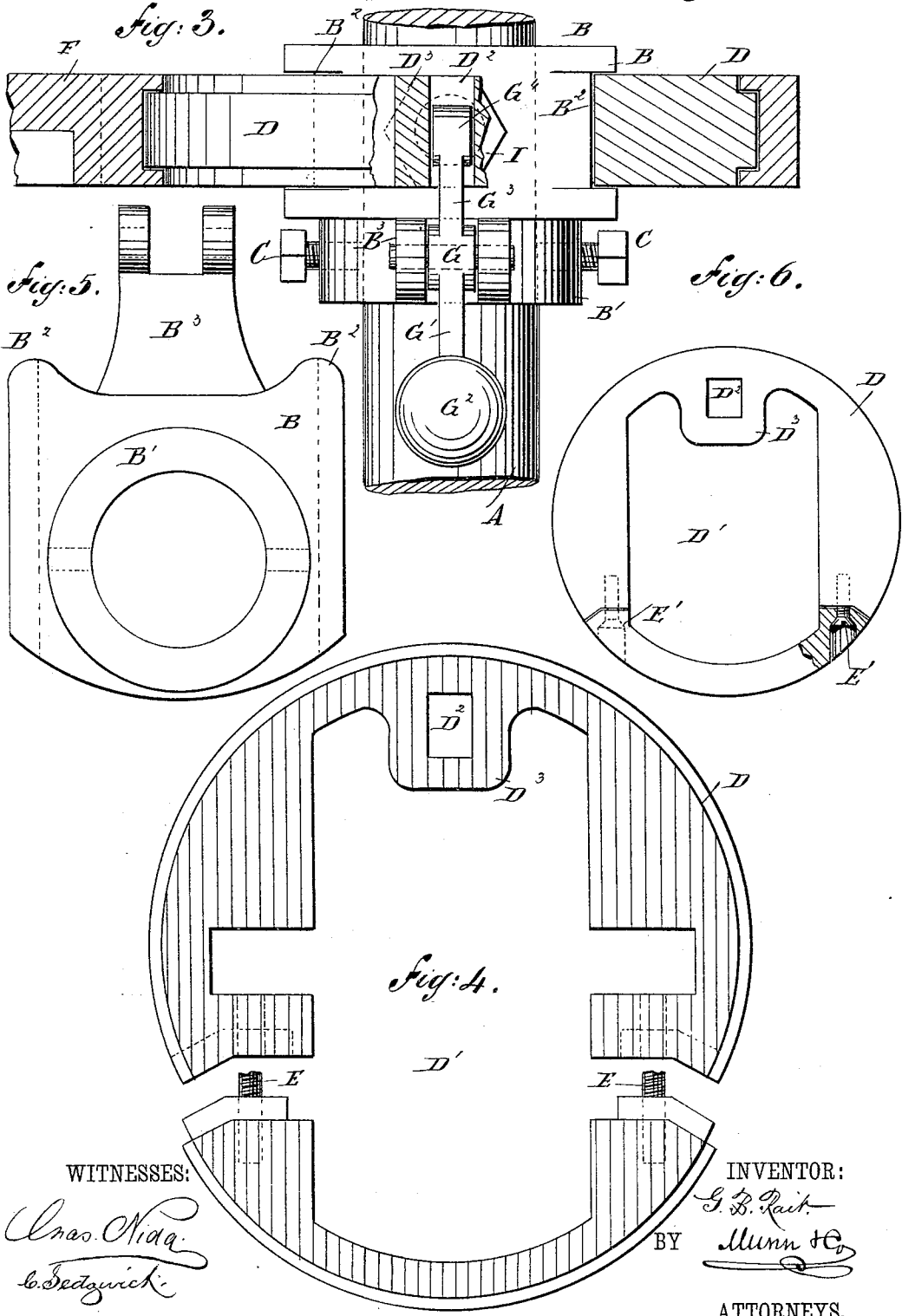
*Munn & Co*

ATTORNEYS.

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# UNITED STATES PATENT OFFICE.

GEORGE B. RAIT, OF EVERLY, IOWA.

## CUT-OFF-VALVE GEAR.

SPECIFICATION forming part of Letters Patent No. 388,304, dated August 21, 1888.

Application filed March 16, 1888. Serial No. 267,371. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE B. RAIT, of Everly, in the county of Clay and State of Iowa, have invented a new and Improved Cut-Off-Valve Gear, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved cut-off for regulating automatically the travel of the valve of a steam-engine according to the speed of the main driving-shaft.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a vertical cross-section of the same on the line  $xx$  of Fig. 1. Fig. 3 is a sectional plan view of the same on the line  $yy$  of Fig. 1. Fig. 4 is a face view of the eccentric. Fig. 5 is a face view of the block; and Fig. 6 is a face view, partly in section, of an eccentric of modified form.

On the main driving-shaft A of a steam-engine is secured the block B by set-screws C, or other suitable means, passing through the hub B' of the block B and on the shaft A. On two sides of the block B are formed the guideways B<sup>2</sup>, in which is held to slide the eccentric D, provided for this purpose with a central aperture, D', the two opposite walls of which fit on the said guideways B<sup>2</sup>. In order to place the eccentric D on the guideways B<sup>2</sup> of the block B, I prefer to make the said eccentric in two or more parts, as illustrated in the drawings, and fasten the said parts together by bolts and nuts E, as illustrated in Figs. 1 and 4, or by means of screws E', as illustrated in Fig. 6. On the periphery of the eccentric D is fitted, in the usual manner, an eccentric-strap, F, connected by the usual means with the valve of the steam-engine. On the hub B' of the block B is formed an arm, B<sup>3</sup>, on which is fulcrumed a lever, G, provided on its arm G' with a weight, G<sup>2</sup>, and provided on its other arm, G<sup>3</sup>, with a ball, G<sup>4</sup>, fitting into an aperture, D<sup>2</sup>, formed in a lug, D<sup>3</sup>, secured to or formed on the eccentric D. A spring, H, rests

with its outer end against the lug D<sup>3</sup>, and with its other end is held in the cup-nut I, screwing in the block B, and serving to regulate the tension of the said spring H by adjusting said nut I in the block B.

The operation is as follows: The spring H is of sufficient tension to hold the eccentric D in the position shown in Figs. 1 and 2, so that the eccentric makes its full stroke when the shaft A is revolved. The rotary movement of the shaft A causes its block B to impart a rotary movement to the eccentric D, which by its eccentric-strap F transmits the usual motion to the valve of the engine. Now, when the speed of the engine exceeds its normal point, the ball G<sup>2</sup> of the lever G is thrown outward by centrifugal force, so that the other end, G<sup>4</sup>, of the lever G moves inward and causes the eccentric D to slide on the block B in the direction of the arrow  $a'$ , whereby the stroke of the eccentric D is diminished as the center of the shaft A comes nearer the center of the eccentric D. In consequence of this the stroke of the eccentric is shortened and the valve cuts off sooner. As less steam is thus admitted to the cylinder, the speed of the engine decreases until it reaches its normal point, and then the ball G<sup>2</sup> of the lever G is again moved inward to its former position by the action of the spring H, which counterbalances said weighted lever G. Thus the eccentric D is caused to slide in the inverse direction of the arrow  $a'$  until the block B and the eccentric D are again in the same position as before, and as illustrated in Figs. 1 and 2. Thus it will be seen that whenever the engine exceeds its normal speed the valve cuts off until the speed is diminished to a normal speed.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a shaft-block having two of its sides parallel to form ways, of an eccentric having a transverse opening formed with parallel side walls fitting said ways to allow the eccentric to slide thereon, an expansion-spring within said opening and bearing against one end wall thereof and against the adjacent end of the block, and a vertically-swinging lever at right angles to the block and eccentric, weighted at its outer end and engaging the eccentric at its inner end to throw

the eccentric against the action of the spring, substantially as set forth.

2. The combination, with the engine block B, having ways B<sup>2</sup> B<sup>3</sup>, a hub, B', and a standard, B<sup>3</sup>, of the eccentric D, having a transverse central opening the side walls of which fit the said ways to allow the eccentric to slide thereon, and a recess, D<sup>2</sup>, near the outer end of said opening, a lever, G, pivoted between its ends to the standard B<sup>3</sup>, parallel with the axis of the block, having a weight at its outer end, and engaging the recess D<sup>2</sup> with its inner end to slide the eccentric in the direction of the length of its opening, and an expansion-spring for returning the eccentric to its normal position, substantially as set forth.

3. In a cut-off for steam-engines, the combination, with a block secured to the main driving-shaft, of an eccentric held to slide on the said block, and a weighted lever fulcrumed on the said block and engaging the said eccentric, a cup-nut screwing on the said block, and a spring resting with one end in the said cup-nut and with its other end against the said eccentric, substantially as shown and described.

GEORGE B. RAIT.

Witnesses:

A. S. WEIR,  
LEWIS VOIGHT.