

No. 789,714.

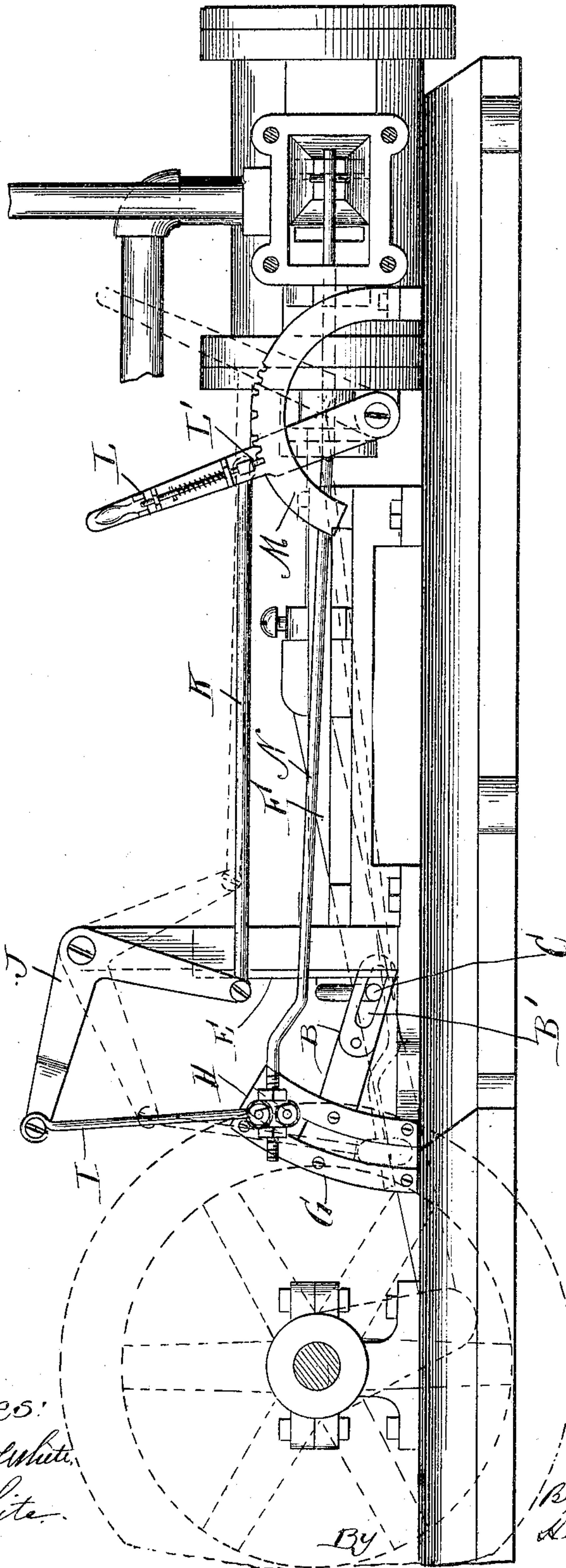
PATENTED MAY 16, 1905.

R. C. CARROLL, DEC'D.
S. J. CARROLL, ADMINISTRATRIX.
VALVE GEAR.

APPLICATION FILED MAY 7, 1904.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Harry A. White,
Ray White.

Inventor:
Ray C. Carroll, deceased
Sarah Jane Carroll, Adm'x.
By *[Signature]* and
H. M. Richards Att'ys.

By

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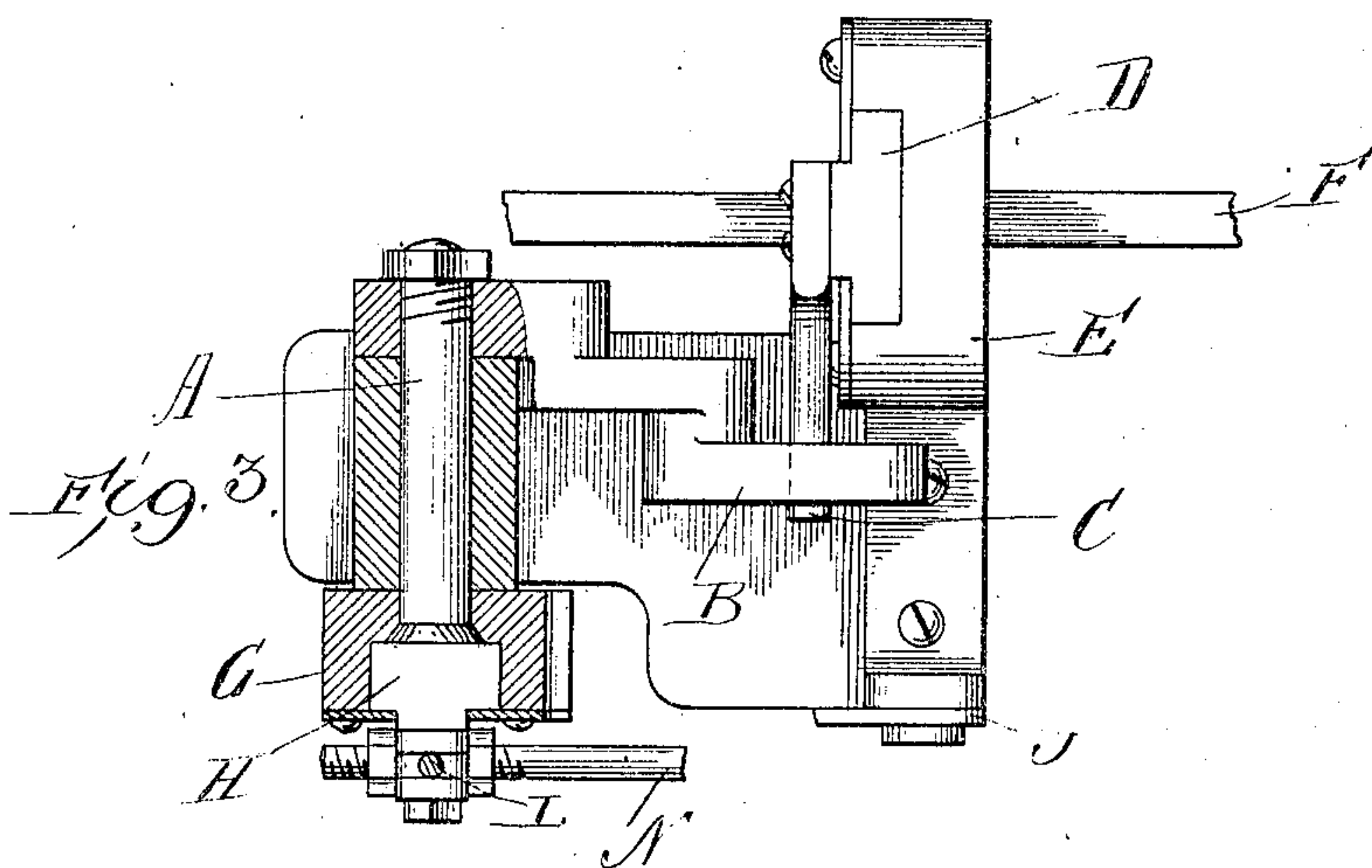
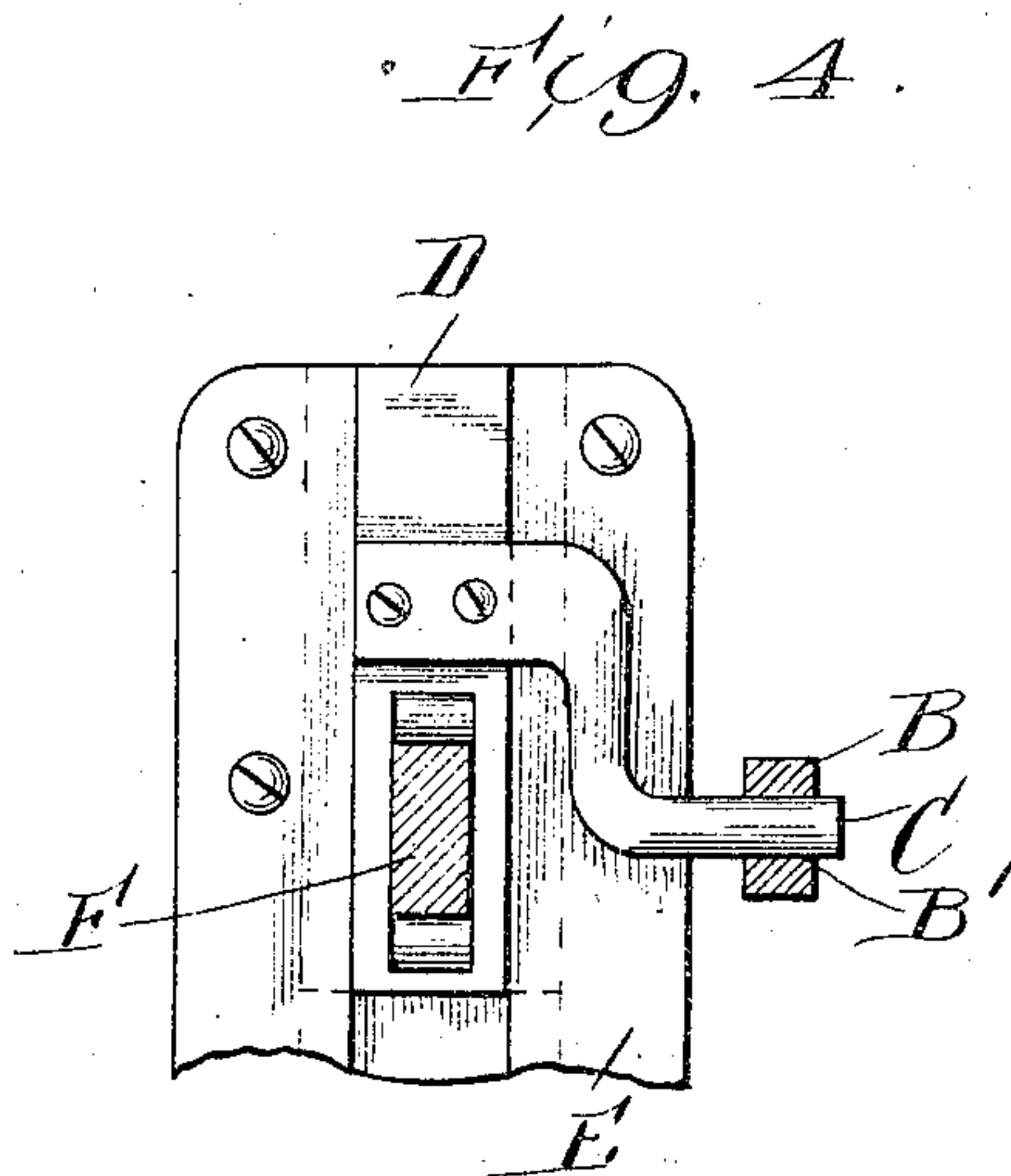
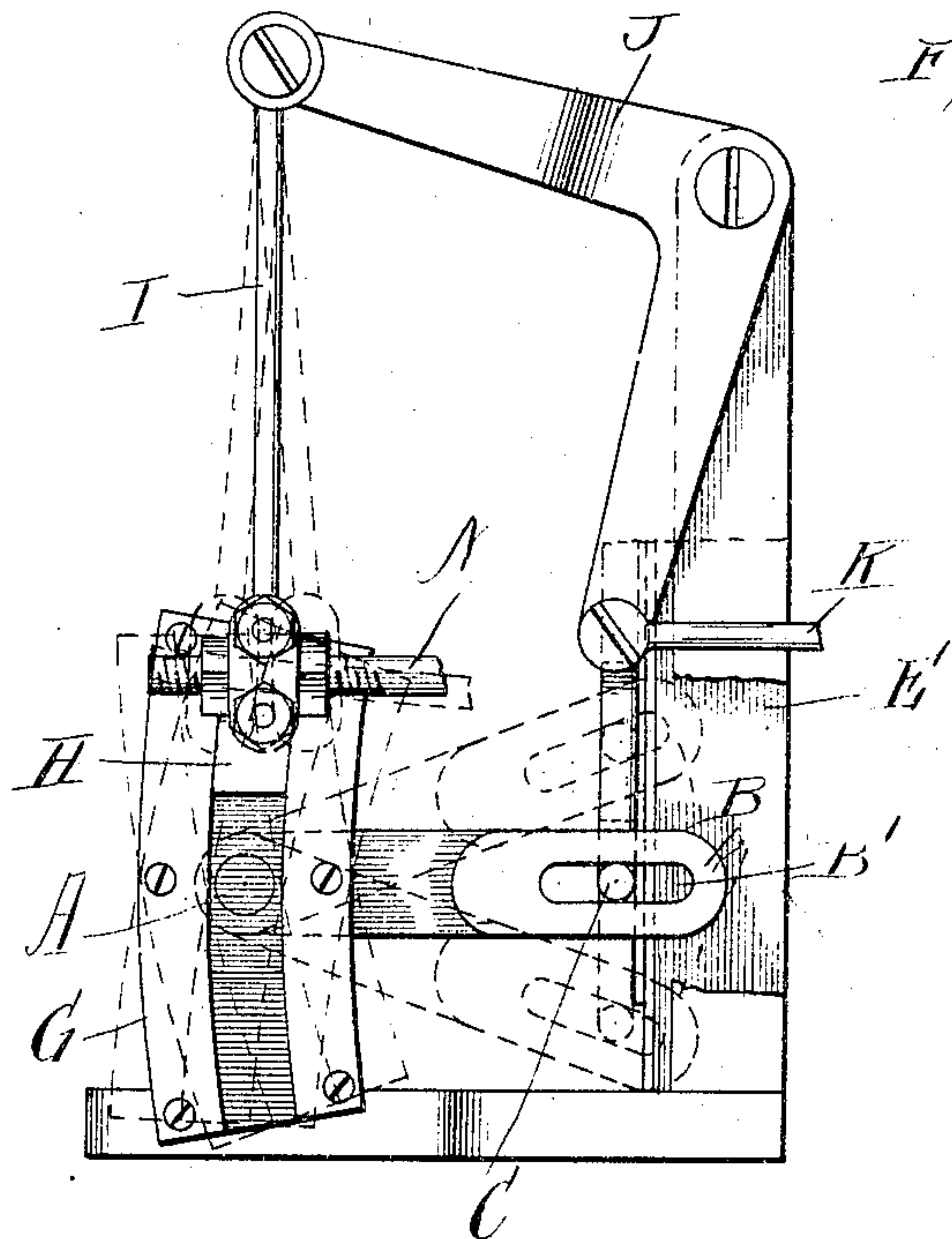
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2 SHEETS—SHEET 2.



Witnesses:
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Inventor
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UNITED STATES PATENT OFFICE.

SARAH JANE CARROLL, OF GALESBURG, ILLINOIS, ADMINISTRATRIX OF
RAY C. CARROLL, DECEASED.

VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 789,714, dated May 16, 1905.

Application filed May 7, 1904. Serial No. 206,840½.

To all whom it may concern:

Be it known that RAY C. CARROLL, deceased, (SARAH JANE CARROLL, administratrix, a citizen of the United States, residing at Galesburg, in the county of Knox and State of Illinois,) did invent certain new and useful Improvements in Valve-Gears, of which the following is a specification.

The principal object of the present invention is to provide a valve-gear of such construction that the efficiency of the engine will be increased by reason of the fact that the valve will be given a quick movement and may be made to cut off at about half-stroke, or less, if desired.

In order to accomplish this object, the use of eccentrics, links, and other parts that are customarily used on valve-gears of locomotives are dispensed with, and in lieu thereof a single part, hereinafter called a "reversing-link," which derives its movement from the lateral or vertical movement of the piston-rod or pitman, is used. The parts are so arranged that they will produce a quick opening-and-closing movement of the valve and so time this movement that it will commence the opening of the valve at about the completion of the backward stroke of the engine and complete it considerably within a quarter-revolution. By reason of this quick opening-and-closing movement a saving in the matter of steam, and consequently a saving in the cost of operating the engine, is effected.

The invention also contemplates improved means whereby the valve-gear may be set for either a forward or a backward movement of the engine, and to this end a controlling-lever which is adapted to shift a certain part to one or the other side of the center of motion of another part is used, the arrangement being such that when the controlling-lever is in central position the valve will remain in central position and at rest, notwithstanding the movement of some of the other parts of the valve-gear, and while the valve is in this position the engine will drift.

The invention consists in the features of novelty that are herein described, and in order that it may be fully understood it will be described

with reference to the accompanying drawings, 50 which are made a part of this specification, and in which—

Figure 1 is an elevation of a stationary engine having a valve-gear embodying the invention. Fig. 2 is an enlarged elevation of a part which is herein called the "reversing-link" and its accessories. Fig. 3 is a plan view thereof with some of the parts in horizontal section. Fig. 4 is an elevation of the slide and its accessories. 60

In Patent No. 715,755, granted December 16, 1902, to Ray C. Carroll and George S. Roberts, is shown and described a valve-gear resembling in some respects the construction and mode of operation of the valve-gear of the present application. The valve-gear shown and described in the patent was found to be too complex in the matter of construction. 65

The object of the present invention is to provide a valve-gear which is of simpler construction and that will produce equally as good if not better results than the valve-gear of the patent. 70

In the invention of the patent aforesaid there were several so-called "rockers" (corresponding with the part herein called a "reversing-link") each acting through the medium of intervening parts upon the other for operating the valve. In the invention of the present application there is only a single reversing-link, which derives its movement from the pitman, through the medium of a shaft A and a crank arm or lever B, which latter has a slot B', occupied by a pin C, carried by a slide D, mounted to work in a stationary vertical guideway E and engaged by the pitman F, so that as the pitman moves laterally up and down it will impart corresponding movement to the slide, and this in turn will impart corresponding movement to the shaft and its arm. The shaft is non-rotatively secured to the reversing-link G, and this reversing-link is provided with a curved slot or undercut groove, in which a block H is so mounted that it may be moved to one or the other side of the center of motion of the reversing-link. The construction of this block or slide is immaterial so far as the present in- 75 80 85 90 95

vention is concerned. As shown in the drawings, it is simply a block of rectangular cross-section, but curved longitudinally in order to conform to the curvature of the slot in the reversing-link. It is capable of moving toward and from the center of oscillation of the reversing-link, and it is its position with relation to said center which determines both the extent and the direction of the throw of the valve. To this end the block is connected, by means of a link I, with one arm of a bell-crank lever J, the other arm of which is connected, by means of a link or rod K, with a reversing-lever L, having a pawl L' adapted for engagement with a segmental rack M. This rack has a central notch adapted for engagement with the pawl, and when the pawl is in engagement with this central notch the block aforesaid will be precisely opposite the center of motion of the reversing-link, so that the rod N, connecting the block with the valve of the engine, will receive no motion whatever, notwithstanding the continual rocking motion of the reversing-link. On the other hand, when the lever is thrown to one or the other side of the center the block will correspondingly be drawn to one or the other side of the center of the reversing-link, and the rod connecting the block and valve will receive an endwise-reciprocating movement, and the extent of this movement will depend upon the distance that the latch is moved from the center of the segment. Hence it will be seen that by moving the latch-lever to one or the other side of the center of its movement the engine will be conditioned to run in one or the other direction accordingly. The invention is not concerned with the construction of the valve. A D-valve of customary construction may be used.

What is claimed as new is—

1. A valve-gear having in combination a slide adapted to derive its movement from a moving part of the engine, a stationary vertical guide for the slide, a reversing-link having a centrally-disposed arm, means for transmitting movement from the slide directly to said arm, a block carried by the reversing-link and movable to either side of the center of oscillation thereof, and means for transmitting movement from the block to the valve, substantially as described.

2. In a valve-gear the combination with a slide, adapted to be moved by the pitman and

a stationary vertical guide for the slide, of a reversing-link, means for transmitting movement from the slide to the reversing-link, a block carried by the reversing-link and adapted to be moved to either side of the center of movement thereof, and means for transmitting movement from the block to the valve, the reversing-link being provided with an undercut slot, or guideway, in which the block is adapted to work, substantially as described.

3. In a valve-gear the combination of a slide adapted to derive movement from the pitman, a stationary vertical guide therefor, a shaft having an arm provided with a slot, a reversing-link carried by the shaft and provided with an undercut guideway, a block fitting said guideway, a rod connected at one end to the block and at the other end to the valve, and means under the control of the operator for shifting the block to either side of the center of oscillation of the reversing-link, substantially as described.

4. In a valve-gear the combination of a vertical guideway, a slide mounted therein and engaged by the pitman, a rock-shaft, a slotted arm carried by the rock-shaft, a pin carried by the slide, and occupying the slot of the arm aforesaid, a reversing-link carried by the rock-shaft and having an undercut guideway, a block occupying said guideway and adapted to be moved to either side of the center of oscillation, a rod connecting said block with the valve, and means under the control of the operator for moving the block to either side, or to the center of oscillation of the reversing-link, substantially as described.

5. In a valve-gear the combination of a slide adapted to derive movement from the pitman, a shaft, means including a pin and a part having a slot occupied by the pin for transmitting movement from the slide to the shaft, a reversing-link carried by the shaft, a block slidably mounted upon the reversing-link, a valve-rod connected to the block, and means under the control of the operator for shifting the block to either side of the center of oscillation of the reversing-link, substantially as described.

SARAH JANE CARROLL,
Administratrix of the estate of Ray C. Carroll, deceased.

Witnesses:

D. J. GRISWOLD,
F. W. WOLF.