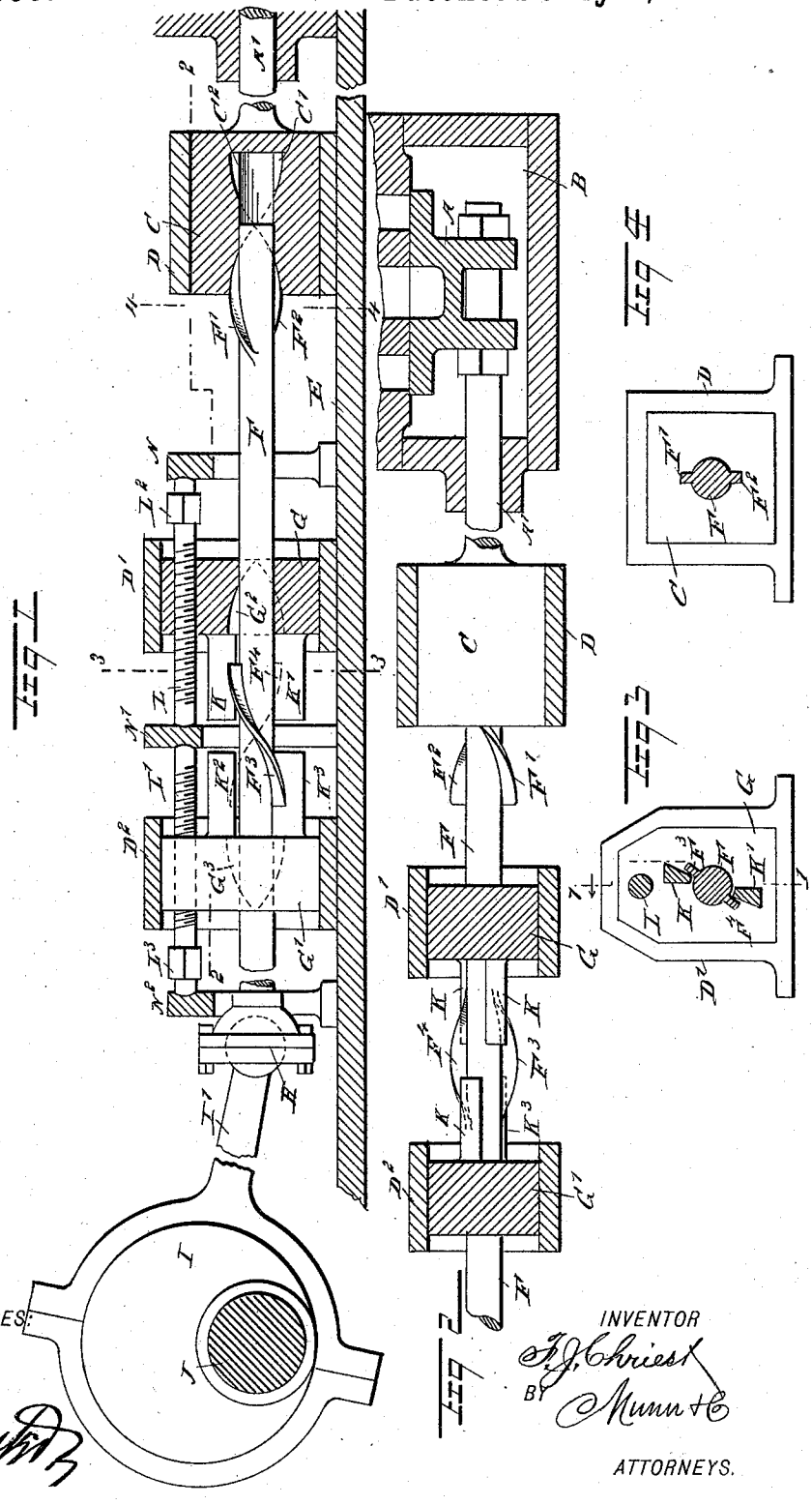
(No Model.)

F. J. CHRIEST.

VALVE GEAR.

No. 542,553. Patented July 9, 1895.



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VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 542,553, dated July 9, 1895.

Application filed March 8, 1895. Serial No. 541,013. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. CHRIEST, of Fort McPherson, in the county of Fulton and State of Georgia, have invented a new and Improved Valve-Gear, of which the following is a full, clear, and exact description.

The invention relates to single eccentric valve-gears; and its object is to provide a new and improved valve-gear arranged to give any desired amount of stroke and a very high speed to the valve, to give sufficient time for the exhaust, and to permit of adjustment for lost motion, at the same time permitting more steam to pass into one end of the cylinder than into the other if desired.

The invention consists principally of a nut-block connected with the valve and adapted to receive an intermittent sliding motion from the eccentric.

The invention also consists in 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 views.

Figure 1 is a sectional side elevation of the improvement on the line 1 1 of Fig. 3. Fig. 2 is a sectional plan view of the same on the line 2 2 of Fig. 1. Fig. 3 is a transverse section of the same on the line 3 3 of Fig. 1, and Fig. 4 is a similar view of the same on the line 4 4 of Fig. 1.

The slide-valve A, to be set in motion by the valve-gear, is mounted to slide over the usual cylinder-ports opening into the steam-chest B, as will be readily understood by reference to Fig. 2, and the said slide-valve A is provided with a valve-stem A′, attached at its outer end to a nut-block C, fitted to slide in a guideway D, attached to the frame E of the engine. This nut-block C is formed with two spiral grooves C′ and C^2, adapted to be engaged by similar V-shaped threads F′ and F^2, respectively, secured on a rod F extending longitudinally, preferably in alignment with the stem A′, the said rod having its bearings in blocks G and G′, held longitudinally adjustable in bearings D′ and D^2, likewise secured to the frame E.

The outer end of the rod F is connected by a ball-and-socket joint H with the eccentric rod I′ of a large eccentric I, secured on the main driving-shaft J of the engine. On the rod F, between the blocks G and G′, are secured the spiral threads F^3 and F^4, located opposite each other and adapted to engage spiral grooves G^2 and G^3 in the blocks G and G′, respectively. The said spiral threads F^3 and F^4 are guided between the blocks G and and G′ on longitudinally-extending sets of pins K K′ and K^2 K^3, respectively, secured to the blocks G and G′ and projecting toward each other, as plainly indicated in Fig. 1.

Now it will be seen that when the eccentric I is set in motion by the driving-shaft J turning, then the rod I′ will impart a sliding motion to the rod F, and as long as the spiral threads F^3 and F^4 are out of engagement with the grooves G^2 and G^3, then the rod F receives a sliding motion only, without turning, and as at this time the spiral threads F′ and F^2 are in engagement with the grooves C′ and C^2 in the nut-block C, a longitudinally-sliding motion is given to this block, and consequently to the valve A, to move the latter into an outermost position. As soon, however, as either end of the spiral threads F^3 and F^4 passes into either the groove G^2 or G^3, then the rod F, besides its sliding motion, receives a turning motion, and consequently the threads F′ and F^2 will unscrew or screw into the grooves C′ and C^2, whereby the block C remains at a standstill.

It is understood that the rod F is free to turn, owing to its ball-and-socket-joint connection H with the eccentric-rod I′. Now the travel of the valve corresponds with the distance the threads F^3 and F^4 are from the opposite faces of the blocks G G′, where the grooves G^2 and G^3 begin, and consequently the valve remains at a standstill at the end of each stroke at the time the threads F^3 and F^4 screw into either the groove G^2 or G^3. It will further be seen that at the time the threads F^3 and F^4 enter either set of grooves G^2 or G^3 the eccentric I is not yet at the end of its stroke; but at the same time the travel of the valve A ceases, as previously mentioned, so that the valve remains in an open position at either end of the stroke, to insure

a full exhaust and a full admission of steam to the corresponding end of the cylinder.

By adjusting the blocks G and G′ nearer to or farther from each other more or less travel can be given to the valve A, as then the threads F^3 and F^4 enter the grooves G^2 and G^3 sooner or later, as the case may be. In order to adjust these blocks G and G′, I provide the screw-rods L and L′, screwing in the blocks G and G′, respectively, as plainly indicated in Fig. 1. The screw-rod L has its bearings in the posts N and N′, and the other screw-rod L′ has its bearings in the posts N^2 and N′, of which the latter is centrally arranged between the two bearings D′ and D^2 to form a bearing for both screw-rods. The latter are provided with polygonal offsets L^2 and L^3, for applying a wrench or other tool to turn either of the screw-rods to adjust the blocks G and G′ correspondingly.

By having an independent adjustment for each of the blocks G and G′ the latter can be so adjusted that the valve A will admit more steam to one end of the cylinder than to the other, as one block can be moved farther from the ends of the screw-threads F^3 or F^4 than the other at the time the eccentric I is in an eccentric position, as shown at Fig. 1, and consequently the valve A will come to a standstill sooner at one end of the stroke than at the other.

By the arrangement described a very high rate of speed can be given to the valve A and the stroke of the latter shortened, so that the valve can remain open for a long time at the end of the stroke during the time the eccentric is moving into the extreme positions and back before a sliding of the valve again takes place.

Thus when the device is employed, for instance, on a Corliss engine, the exhaust-valves can be opened very quickly and left open for a long time, and still close at the proper moment to permit of the proper compression of the motive agent. It will further be seen that any desired lead may be given to the valve, as the eccentric can be set correspondingly and the blocks G and G′ adjusted accordingly.

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

1. A valve gear, provided with a nut-block connected with the valve and adapted to receive an intermittent sliding motion from the eccentric through the medium of a rod which has a reciprocating and rotary motion imparted to it substantially as described.

2. A valve gear provided with a nut-block connected with the valve, a rod receiving a reciprocating motion from an eccentric, means for turning the rod during a part of its stroke, and threads on the said rod engaging corresponding grooves in the said nut block, substantially as shown and described.

3. A valve gear, comprising a nut-block connected with the valve, a rod mounted to turn and to slide and receiving a reciprocating motion from an eccentric, a set of threads on the said rod engaging grooves in the said nut-block, a set of blocks, and a second set of threads on the said rod to engage the grooves on the said set of blocks during part of the stroke of the rod, substantially as shown and described.

4. A valve gear, comprising a nut-block connected with the valve, a rod mounted to turn and to slide and receiving a reciprocating motion from an eccentric, a set of threads on the said rod engaging grooves in the said nut-block, a set of blocks, a second set of threads on the said rod to engage the grooves in the said set of blocks during part of the stroke of the rod, and means, substantially as described, for adjusting the said set of blocks, as set forth.

5. A valve gear, comprising a rod for imparting an intermittent motion to the valve, the said rod being mounted to turn and to slide, a ball and socket connection for connecting one end of the said rod with an eccentric rod, threads held on the said rod, and a set of adjustable nut blocks adapted to be engaged by the said threads during part of the stroke of the rod, substantially as shown and described.

6. A valve gear, comprising a rod for imparting an intermittent motion to the valve, the said rod being mounted to turn and to slide, a ball and socket connection for connecting one end of the said rod with an eccentric rod, threads held on the said rod, a set of adjustable nut blocks adapted to be engaged by the said threads during part of the stroke of the rod, and means for independently adjusting the said blocks, as set forth.

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