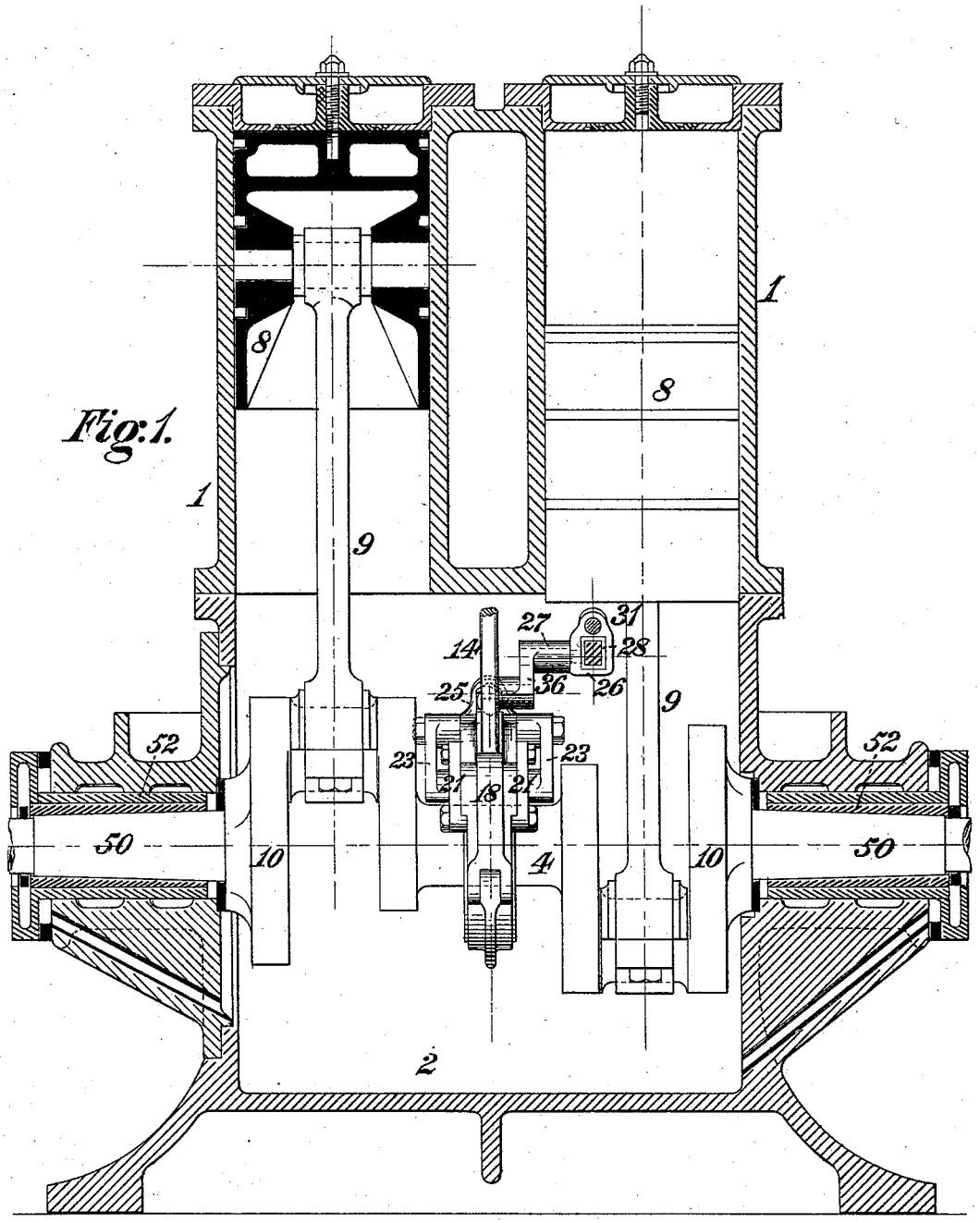
(No Model.) 2 Sheets—Sheet 1.

F. M. RITES.

REVERSE GEAR FOR ENGINES.

No. 343,494. Patented June 8, 1886.

Fig. 1.



WITNESSES:

J. Thornton Bell.

C. M. Clarke

INVENTOR,

Francis M. Rites,

George H. Christy Att'y.

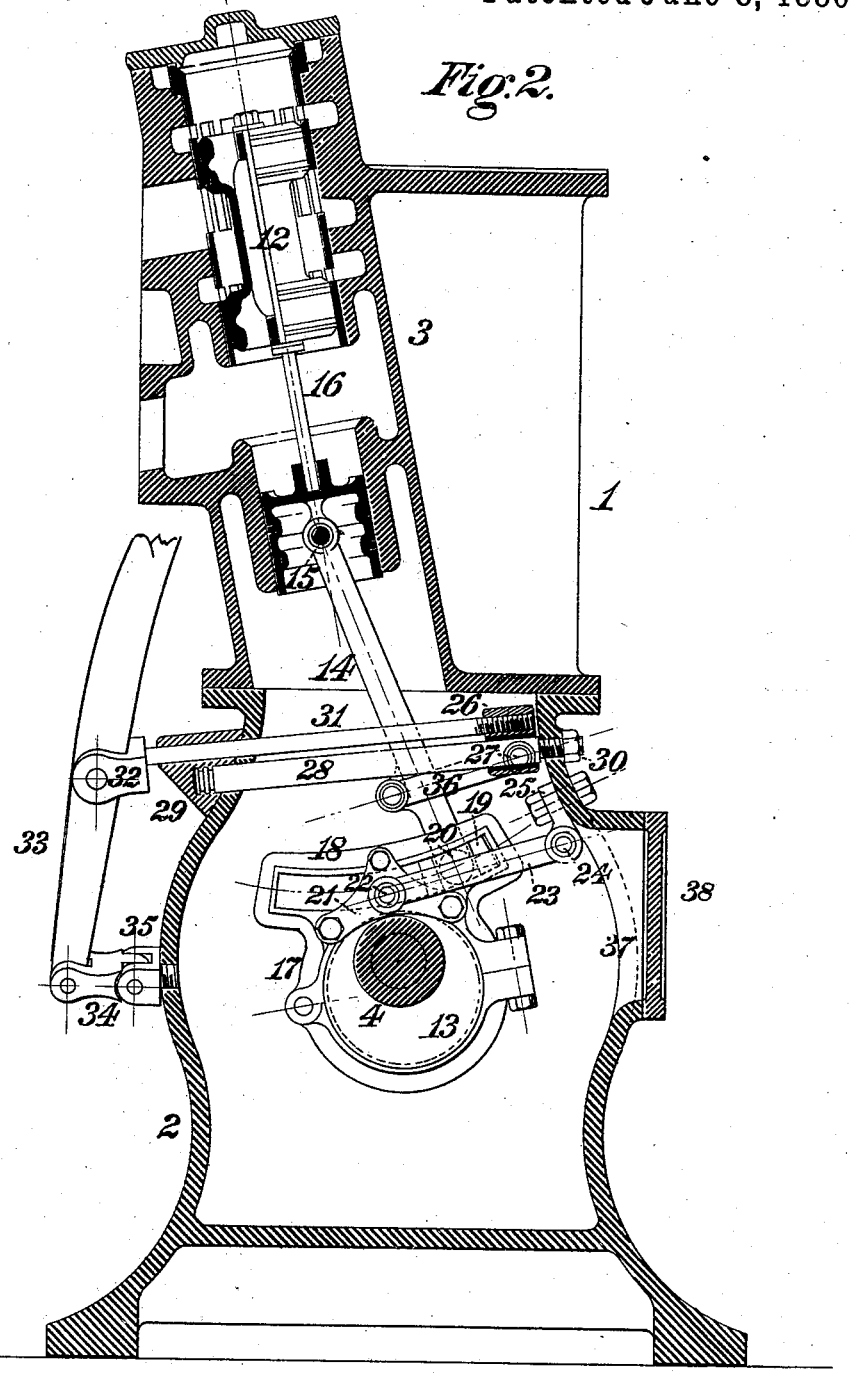
(No Model.) 2 Sheets—Sheet 2.

F. M. RITES.

REVERSE GEAR FOR ENGINES.

No. 343,494. Patented June 8, 1886.

Fig. 2.



WITNESSES:

S. Thorden Bell.

F. M. Clarke

INVENTOR,

Francis M. Rites,

George H. Christy Att'y.

UNITED STATES PATENT OFFICE.

FRANCIS M. RITES, OF PITTSBURG, PENNSYLVANIA.

REVERSE-GEAR FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 343,494, dated June 8, 1886.

Application filed April 21, 1886. Serial No. 199,714. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS M. RITES, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered a certain new and useful Improvement in Reversing Mechanism for Steam-Engines, of which improvement the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a vertical longitudinal section through a steam-engine, illustrating the application of my invention; and Fig. 2, a vertical transverse section through the same at the center of the valve-chest.

The object of my invention is to provide a reversing mechanism of simple, compact, and inexpensive construction, which may be effectively applied in an engine having a crank-shaft rotating in a closed case.

To this end my invention, generally stated, consists in the combination of an eccentric having a segmental link upon its strap which is coupled to a fixed bearing, a valve-rod journaled to a block fitting in said link, and a block adapted to traverse on a fixed guide and coupled to the valve-rod and to a reverse-lever.

The improvement claimed is hereinafter fully set forth.

My invention is herein shown as applied in a double-cylinder single-acting engine having its crank-shaft inclosed in a case or chamber, but may obviously be embodied in engines of other types without variation of structural or operative principle. The cylinders 11 are fixed upon the top of a closed crank case or chamber, 2, which serves as a receptacle for lubricating material, and their pistons 8 are coupled by connecting-rods 9 to the crank-pins of a pair of double cranks, 10, which are set oppositely on a crank-shaft, 4, the journals 50 of which are mounted in bearings 52 in the ends of the crank-case. Steam is admitted to and exhausted from the cylinder-spaces above the pistons by a main or distribution-valve, 12, which reciprocates in a valve-chest, 3, and governs suitable ports leading therefrom to the cylinders. The distribution-valve 12 is actuated by an eccentric, 13, fixed upon the crank-shaft through a valve-rod, 14, which connects a pin, 15, on the valve with the eccentric-strap, the construction, so far as described, being that heretofore known and practiced in engines of this class.

In the practice of my invention I form upon or secure to the section of the eccentric-strap 17, nearest to the valve, a segmentally-slotted link, 18, of the "Allen" type, having a radius of curvature at center equal to the distance therefrom to the center of the valve-rod pin 15. A die or block, 19, is fitted to slide freely longitudinally in the slot of the link 18, and the lower end of the valve-rod 14 is coupled by a pin, 20, to the die 19. A plate, 21, having a pin or bolt, 22, on its outer face is secured to each side of the link 18, and the pins 22 are coupled by links 23 to a bearing-pin, 24, fixed in a plate, 25, which is bolted to the inside of the crank-case. Reversal of the direction of movement of the crank-shaft is effected by shifting the die 19 from one to the other end of the slot of the link 18, for which purpose the following mechanism is employed: A reversing-block or cross-head, 26, having a pin, 27, on one of its sides, is fitted to slide freely longitudinally upon a transverse guide-bar, 28, which is fixed at its ends to the opposite sides of the crank-case 2. The guide-bar 28 may be conveniently held in position by the construction shown in Fig. 2, in which a head, 29, cast upon one end of the guide-bar is curved on its inside in conformity with and fits against the outer surface of one side of the crank-case, and the guide-bar, which passes through both sides of the case, is threaded at its opposite end to engage a nut, 30, bearing against the outer surface of the adjacent side of the case. The valve-rod 14 is coupled by a link, 36, to the pin 27 of the reversing-block 26, and a rod, 31, which is secured to the reversing-block 26, above the guide-bar 28, passes freely through a guide or socket in the head 29, and is coupled exterior thereto by a pin, 32, to a reverse-lever, 33, which is coupled by a link, 34, to a bearing, 35, on the outside of the crank-case.

My improvement enables the reversing mechanism to be compactly located for effective operation within the limited space obtainable in the interior of the crank-case, and by means of an opening, 37, closed by a lid or bonnet, 38, the several members may be readily locat-

ed and connected in position, and removed for renewal or repair whenever the same may become necessary.

I claim herein as my invention—

1. The combination of an eccentric having a segmentally-slotted link upon its strap, an arm or link coupling said slotted link to a fixed bearing, a valve-rod journaled to a block fitting in said slotted link, and a reversing-block adapted to traverse on a fixed guide and coupled to the valve-rod and to a reverse-lever, substantially as set forth.

2. The combination of a crank case or chamber, an eccentric fixed upon a crank-shaft mounted in bearings therein, a guide-bar secured transversely in the crank-case, a reversing-block fitted to slide on said guide-bar, a segmentally-slotted link fixed upon the eccentric-strap, a valve-rod coupled to a block or die fitting in said link and to a valve-stem, a link coupling the valve-rod to the reversing-block, a rod fixed to the reversing-block and passing freely through one side of the crank-case, and a reverse-lever coupled to said rod and to a fixed bearing on the outside of the crank-case, substantially as set forth.

3. The combination of a crank-case, a reversing-block guide-bar passing through both sides thereof, a head fixed upon one end of the guide-bar and having a face conforming to the outer surface of the crank-case and a guide or socket parallel to the guide-bar, a reversing-block fitted to slide on the guide-bar, a rod fixed to said block and fitting freely in the guide-bar head-socket, and a nut engaging a thread on the guide-bar at its end farthest from the head and bearing against the outside of the case, substantially as set forth.

In testimony whereof I have hereunto set my hand.

FRANCIS M. RITES.

Witnesses:

E. W. BRAY,

JAS. L. BELOTE.