

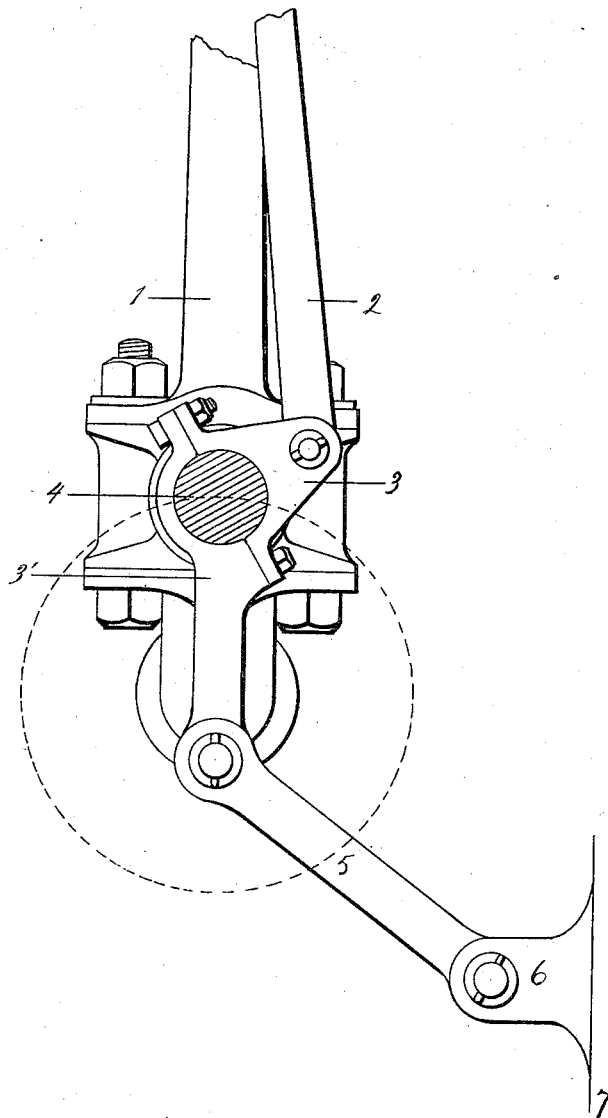
(No Model.)

C. H. BENTON.

VALVE GEAR.

No. 344,027.

Patented June 22, 1886.



*Witnesses:*

*Chas. A. Mitchell.*  
*Horace Benton*

*Inventor:*

*C. H. Benton.*

# UNITED STATES PATENT OFFICE.

CHARLES HORACE BENTON, OF CLEVELAND, OHIO.

## VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 344,027, dated June 22, 1886.

Application filed February 23, 1886. Serial No. 192,601. (No model.)

### *To all whom it may concern:*

Be it known that I, CHARLES HORACE BENTON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Valve-Gear, of which the following is a specification.

My invention relates to an improvement in valve-gear in steam and other engines in which the supply-ports accompany the piston in its reciprocating motion, and is especially adapted to single-acting engines. Heretofore the valves of such engines have been moved by tappets situated in the piston-head or in the cylinder-head, or by the angular motion of the connecting-rod. Such means do not allow of variation of the rapidity of the valve motion relatively to the piston motion.

My improvement has for its object to provide a valve-gear which, while it has the necessary compound motion, can by change in the relation or dimension of its relative parts produce any desired distribution of the motive fluid; and it consists of a lever mounted on and moved by the crank-wrist and connected by one link to the valve-stem, and by a second link caused to oscillate relatively to the crank-wrist.

My invention is illustrated by the drawing. The figure represents an end elevation of the crank-wrist of a single-acting vertical steam-engine.

The connecting-rod is split in two separate parts, and the valve-gear is placed between the two halves. The nearer half of the connect-

ing-rod and the nearer bend of the crank-wrist are not shown.

1 is one part of the double connecting-rod.

2 is a link which joins the valve-stem to the oscillating bell-crank lever 3. The bell-crank lever is made in two parts, 3 and 3', for convenience of placing and adjusting upon the crank-wrist 4.

5 is a second link, one end of which is joined to the arm of the bell-crank lever, and the other end joined to a pair of ears, 6, upon the engine-frame 7. As the crank-shaft revolves, this link causes the arm 3 of the bell-crank lever to oscillate about the crank-wrist 4, thus giving a proper reciprocating motion through the link to the valve-stem.

What I claim, and wish to secure by Letters Patent, is—

1. The combination, in a valve-gear, of a crank-wrist, a lever moved thereby, and two links connected to said lever, one of which gives motion to the valves, and the other causes the lever to vibrate relatively to the crank-wrist, substantially as and for the purpose set forth.

2. The combination, in a valve-gear, of a crank-wrist, a bell-crank lever, 3 and 3', a link, 2, giving motion to the valves, and a link, 5, joined to the engine-frame, substantially as and for the purpose set forth.

CHARLES HORACE BENTON.

Witnesses:

FREDK. J. RAULETT,  
WM. H. WHITE.