

(No Model.)

J. A. HORNBAKE.
VALVE GEAR.

No. 547,213.

Patented Oct. 1, 1895.

Fig. 1.

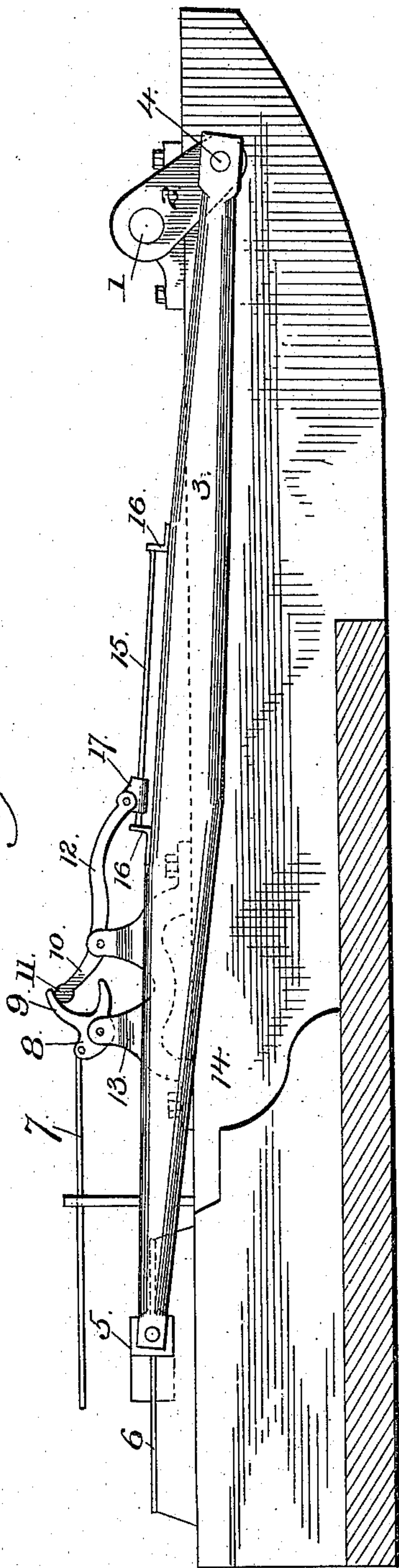


Fig. 2.

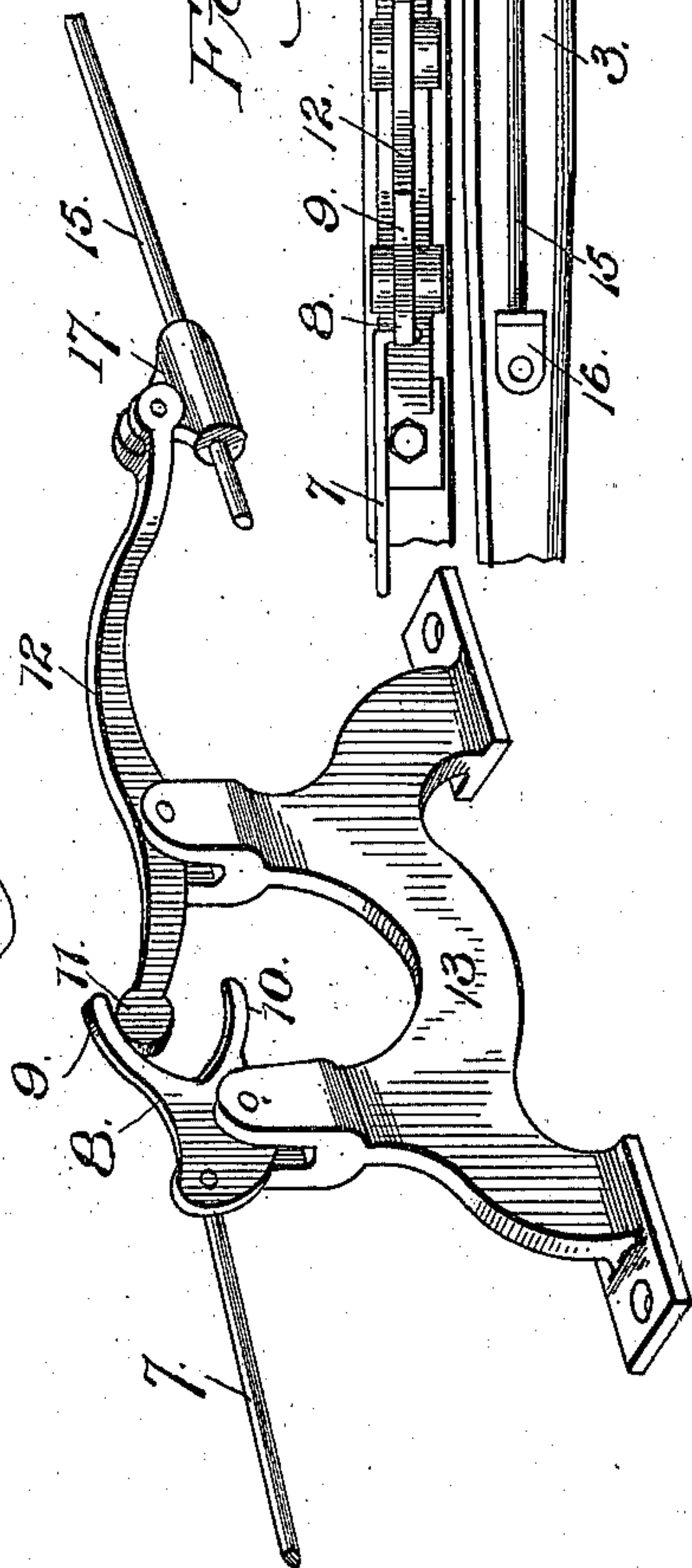
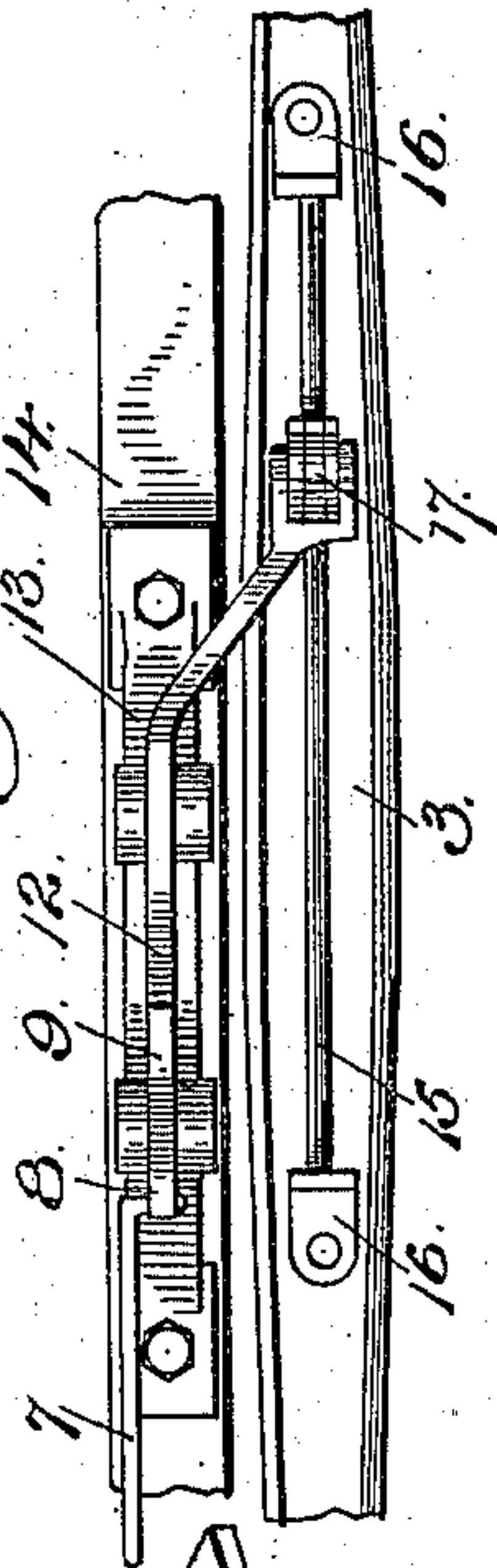


Fig. 3.



Inventor

James A. Hornbake.

Witnesses

Harold H. Simms. By his Attorneys.

[Signature]

[Signature]

UNITED STATES PATENT OFFICE.

JAMES A. HORNBAKE, OF COAL CENTRE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO SAMUEL MCCAIN AND J. V. LEWELLEN, OF SAME PLACE.

VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 547,213, dated October 1, 1895.

Application filed April 25, 1895. Serial No. 547,165. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. HORNBAKE, a citizen of the United States, residing at Coal Centre, in the county of Washington and State of Pennsylvania, have invented a new and useful Valve-Gear, of which the following is a specification.

My invention relates to valve-gear adapted especially for use upon stern-paddle steamers which are in common use upon shallow streams, and the object in view is to provide valve mechanism which is not operated by means of an eccentric and yoke on the paddle-shaft, as in the ordinary construction, but is entirely housed and arranged within reach of the engineer. The objection to the present manner of communicating motion to the valve controlling the inlet of steam to the cylinder is that floating debris, ice, sand, ashes, and various other articles thrown from the boat serve to obstruct, injure, and cause unnecessary wear upon the operating faces of the device.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claim.

In the drawings, Figure 1 is a side view of a valve mechanism constructed in accordance with my invention applied in the operative position to a pitman, crank, and shaft of the ordinary construction. Fig. 2 is a detail view in perspective of the mechanism. Fig. 3 is a detail plan view of the same.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a shaft, which is adapted to carry a paddle-wheel (not shown) of the ordinary construction. 2 is a crank secured to said shaft, and 3 is a pitman connecting the wrist-pin 4 of the crank with the sliding cross-head 5, mounted upon the horizontal guides 6. 7 is a portion of a valve-rod, which is connected at one end to a rocking lever 8, provided with spaced outwardly-deflected jaws 9 and 10, between which operates a rounded head 11 on the extremity of an operating-lever 12. Said rocking and operating levers are mounted, respectively, in bearings formed

upon a bracket 13, arranged upon the bed 14 of the engine.

Secured to and carried by the pitman is a guide-rod 15, held in place at its extremities by angle-irons 16, and sliding upon this guide-rod is a shoe 17, to which is pivotally connected the extremity of the other arm of the operating-lever, the arm which is connected to the shoe being deflected from the line of the arm which forms connection with the rocking lever in order to extend over the pitman.

The vertical motion imparted to the pitman by the rotary motion of the crank-arm is communicated through the guide-rod and shoe to the operating-lever and by the latter to the rocking lever which is connected to the valve-rod, whereby the valve-rod is reciprocated in a manner similar to and with a throw equal to that which is imparted in the ordinary practice by means of an eccentric and yoke. The longitudinal movement of the pitman is allowed without affecting the operating-lever by means of the shoe and the guide-rod, as above described.

From the above description it will be seen that the mechanism for operating the valve is compactly arranged and may be and preferably is disposed within the engine-room within reach of the engineer, where it is protected from injury by the means hereinbefore enumerated, and where it may receive the attention of the operator in the matter of oiling and otherwise without exposing such operator to inclement weather.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

The laterally-deflected jaws 9 and 10 of the rocking lever 8 have concave inner surfaces, the curve of the jaw 10 being struck from a center coincident with the center of the head 11 when said head is at the limit of its upward movement, and the curve of the jaw 9 being struck from a center coincident with the center of the head 11 when the latter is at the limit of its downward movement. The diameter of the head 11 is less than the interval between the arms 9 and 10, whereby

the lever 8 and the valve-rod connected there-
to do not receive a continuous movement,
but are actuated only at the limits of move-
ment of the lever 12, whereby the reversal of
5 the position of the valve connected to the
valve-stem is accomplished at points near or
at the ends of the strokes of the piston, thus
cutting off and admitting the steam without
back-pressure. The concave inner faces of
10 the jaws adapt them for receiving motion
from the rounded head 11 without unneces-
sary friction.

Having described my invention, what I
claim is—

15 The combination with a valve-rod, of a
rocking lever pivotally connected to the valve-
rod and provided with outwardly deflected
jaws 9 and 10 having concave inner faces, an
operating lever pivoted at an intermediate
20 point and provided at the extremity of one of
its arms with a rounded head fitting loosely
between the jaws of the rocking lever and
adapted to alternately engage the same, said

head being of less diameter than the inter-
val between the jaws, to engage the latter at 25
the ends of the strokes, a guide-rod carried
by a pitman forming a part of the mechan-
ism in connection with which the valve gear
is employed, and a shoe mounted to slide
upon the guide-rod and pivotally connected 30
to the other arm of the operating lever,
whereby the transverse movement of the
pitman causes an oscillation of the operating
lever which is communicated to the rocking
lever to impart a reciprocatory movement to 35
the valve-rod, said shoe and guide-rod per-
mitting free longitudinal reciprocation of the
pitman, substantially as specified.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in 40
the presence of two witnesses.

JAMES A. HORNBAKE.

Witnesses:

S. B. PAXTON,
G. H. LEWIS.