(No Model.)

W. W. LOVELL.

VALVE GEAR.

No. 265,682. Patented Oct. 10, 1882.

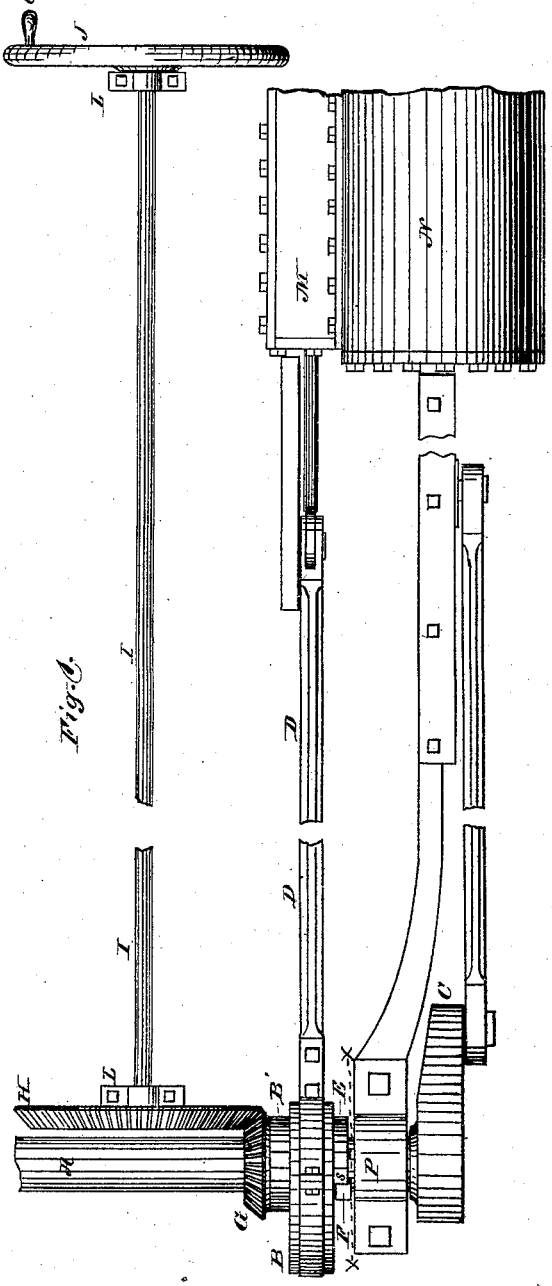

Fig. 1.

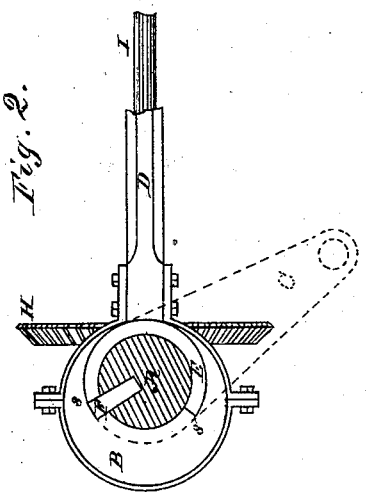

Fig. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

WILLIAM W. LOVELL, OF RACINE, WISCONSIN.

VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 265,682, dated October 10, 1882.

Application filed January 12, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. LOVELL, of the city of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Reversing Devices in Steam-Engine Valve-Gear; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to reversing mechanism in valve-gear of steam-engines. It is more particularly intended and adapted for portable and the lighter class of stationary engines; and it consists essentially in the combination, with the valve-eccentric provided with a suitably-limited free rotative movement on the crank-shaft, of an arrangement of gear-wheels properly mounted, or of equivalent mechanism, whereby the engineer or operator may from a convenient point shift the eccentric and the valves actuated therefrom, and so reverse the motion of the engine.

In the drawings, Figure 1 is a plan of an engine valve-gear provided with my improvement, and Fig. 2 is a vertical section through *x x* of Fig. 1.

The same letter indicates the same part in both figures of the drawings.

A represents the crank-shaft, having the crank C connected in the usual manner with the piston-rod. B is the valve-eccentric, and D is the shaft connecting the valve-rod with the eccentric. Said eccentric B, instead of being made rigid with the crank-shaft A, as commonly done, is fitted to have a free rotative movement of about one-third turn on said crank-shaft. For this purpose the eccentric is provided with a hub, B′, of suitable length to give proper steadiness to the eccentric, and the rotary movement of the eccentric upon the crank-shaft is limited by any appropriate arrangements of stops. Such stops are herein shown to consist of the pin F, set in the crank-shaft A, and the shoulders *s s*, formed by cutting away the eccentric hub at one end for a suitable distance, as shown more clearly in Fig. 2. It is understood of course that the crank-shaft carries the eccentric by contact of the pin F with one of the shoulders *s*, according to the direction in which said shaft is turning, and said pin and shoulders or stops are so arranged with reference to the eccentric and crank as to give the necessary or desired lead to the valves whichever way the engine be running. A reversal of the engine motion will be effected by shifting the eccentric on the shaft, so as to change the bearing of the pin F from one shoulder *s* to the other. For the purpose of enabling the operator to make this shift I have provided the following devices:

G is a beveled pinion, cast or keyed on the hub B′ of the eccentric B.

H is a beveled spur meshing with G and fixed and supported on the shaft I, mounted in suitable bearings, L, and extended backward or otherwise to a point on the machine convenient to the engineer, where it is provided with a hand-wheel, J. Said shaft is in motion when the engine is running.

To reverse the engine by the means described, steam is first shut off the valve-chest, and when the speed is slowed or stopped the wheel J is turned by the engineer to shift the eccentric on the crank-shaft and bring the hitherto-disengaged shoulder *s* in bearing with the pin F. By this rotation of the eccentric B the valves actuated therefrom are also shifted with reference to the piston and crank C, and steam being again let on the motion of the crank-shaft will be reversed. If the reversal is attempted without shutting off steam entirely, or before the motion of the engine has entirely ceased, the wheel J will need to be turned at an accelerated speed in the direction in which it will in that case be running to bring the proper stop *s* in contact with the pin F, and power will of course need to be continued in order to hold the eccentric in such bearing with said pin until the crank-shaft reverses.

Other arrangements of gear may obviously be employed in place of the beveled mesh-wheels G H and shaft I, and the wheel J, which is seized by the operator, may be given any desired rate of relative speed by gear-wheels of proper number or relative size at either end of the shaft I.

I claim as my invention—

The combination of the crank-shaft A, having the pin F, the loose eccentric B, having

stops *s s*, the beveled-gear pinion G, rigid with said eccentric, and the shaft I, provided with the beveled-gear wheel H, meshing with the pinion G, and the hand-wheel J, together arranged and operating substantially as described, and for the purposes set forth.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

WILLIAM W. LOVELL.

Witnesses:
A. CARY JUDD,
GEO. B. JUDD,