

(No Model.)

G. P. SCHNEIDER.
VALVE GEAR.

No. 507,597.

Patented Oct. 31, 1893.

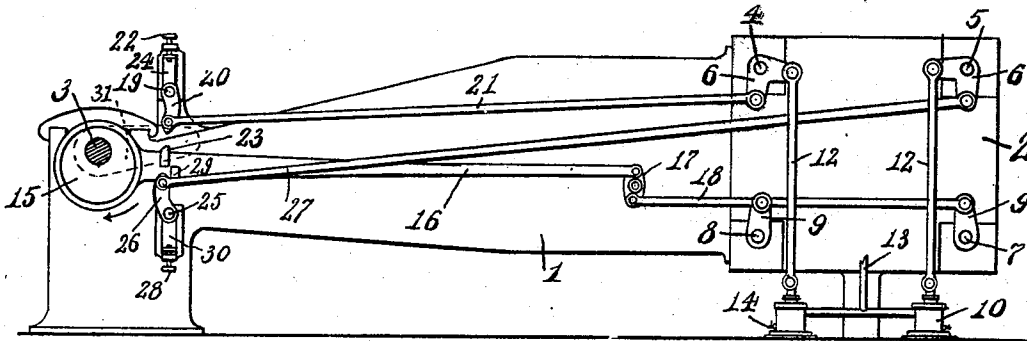


Fig. 1.

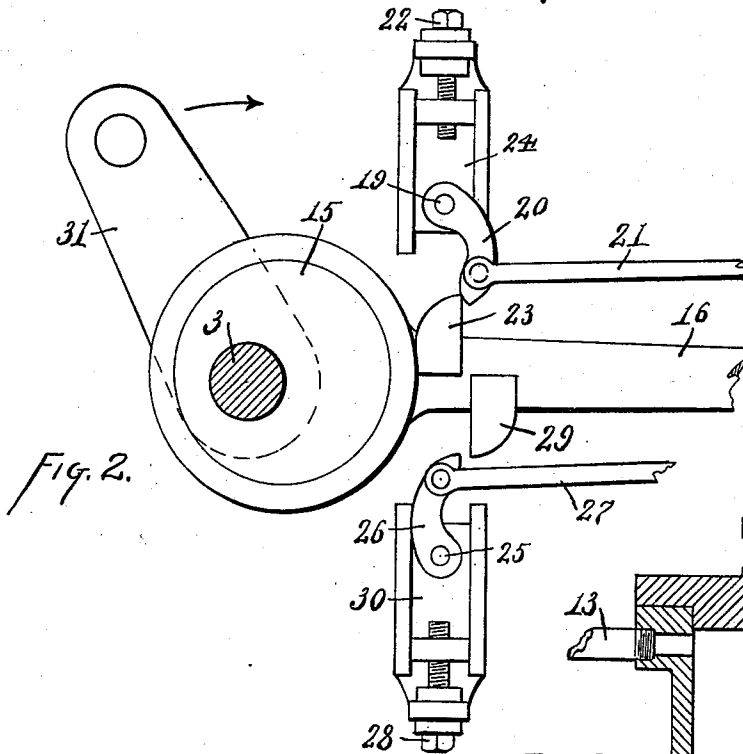
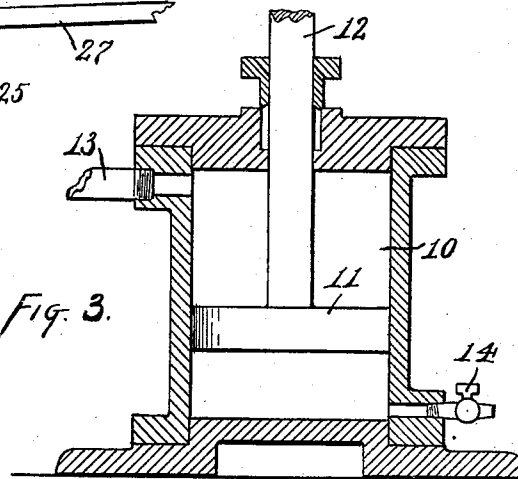


Fig. 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE P. SCHNEIDER, OF CLEVELAND, OHIO.

VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 507,597, dated October 31, 1893.

Application filed October 7, 1892. Serial No. 448,168. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. SCHNEIDER, of Cleveland, Cuyahoga county, Ohio, have invented certain new and useful Improvements in Valve-Gears, of which the following is a specification.

This invention pertains to improvements in valve gears for steam and other engines, and the improvements will be readily understood from the following description taken in connection with the accompanying drawings in which I have illustrated an exemplification of my invention in connection with a steam engine having four valves arranged after the manner of Corliss engines, the valves being operated by my improved gear.

In the drawings:—Figure 1, is an elevation of the rear side of the engine; Fig. 2, an enlarged portion of the same at the eccentric; and Fig. 3, a vertical central section of one of the dash-pots.

In the drawings:—1, indicates the frame of the engine; 2, the cylinder; 3, the shaft; 4, the stem of the forward steam valve; 5, the stem of the back steam valve; 6, bell cranks fast on these stems; 7, the stem of the back exhaust valve; 8, stem of the forward exhaust valve; 9, arms on the stems of the exhaust valves; 10, a pair of dash-pots, one for each steam valve; 11, a piston within each dash-pot; 12, connections from the dash-pot pistons to the cranks upon the stems and of the steam valve to cause downward movement of the pistons to rock the steam valves to closed position, as usual; 13, a pipe communicating with the dash-pot cylinders, above their pistons, and adapted to be connected with any suitable source of steam supply; 14, an air cock in each dash-pot, communicating with the space below the piston of the dash-pot; 15, the eccentric, on the shaft; 16, the eccentric-rod; 17, a rocker to which the rear end of the eccentric-rod is pivoted; 18, a connection from the other end of this rocker to the arms of the two exhaust valves, whereby the eccentric causes the rocking of both exhaust valves; 19, a pivot supported in a position over the eccentric-rod near the eccentric; 20, an arm hanging on this pivot and having its lower end extending down toward the eccentric-rod; 21, a rod connecting this arm with the bell crank 6 of the forward steam valve; 22,

a screw exemplifying means for raising and lowering pivot 19; 23, a tappet on the eccentric-rod, near the eccentric, and presenting its upper end in position to engage and rock arm 20 as the eccentric-rod makes its back stroke; 24, a block arranged for vertical adjustment in a fixed guide and bearing the pivot 19 and adjustable by means of screw 22; 25, 26, 27, 28, 29 and 30, a duplication of parts 19, 20, 21, 22, 23, and 24 respectively, but pertinent to the rear steam valve instead of the forward; and 31, the crank of the engine.

The valve functions and performance are the same as in engines of the ordinary Corliss type. As a steam valve is pulled open the dash-pot piston rises against the pressure of steam above it and, when the valve is released, this pressure on the piston effects the sudden closure of the valve. Air cocks 14 serve in regulating the cushioning effect below the dash-pot system. Live steam pressing at all times upon the dash-pot pistons insures that in starting the engine from a state of rest a prompt valve-closing power will be available. A given point upon the eccentric-rod will, in the course of the movement of the rod, describe an egg oval, the flatness of the oval depending upon the position of the point along the rod, points near the eccentric describing an oval whose minor axis is nearly equal to the major axis, while near the rocker at the rear end of the eccentric-rod the oval becomes one of extreme flatness.

It is to be understood that rocker 17 is a mere expedient for reversing the direction of motion before transmitting motion to the exhaust valve. It will therefore be understood that tappets 23 and 29 move in oval paths. In Fig. 2, tappet 23, having previously moved upward and rearward, has engaged arm 20 and rocked that arm rearwardly and opened its steam valve with an extremely rapid motion and, as the rearward motion of the tappet continues, it tends downwardly at a rapid rate and, as shown in Fig. 2, will shortly disengage from arm 20. When this takes place the valve will be released and the dash-pot will sharply close it. On the back stroke of the eccentric-rod arm 26 will be similarly operated, thus opening the other steam valve. It will be observed that the disengagement of

a tappet from its arm occurs at the time when the tappet, in making its active stroke, reaches a horizontal plane not within the reach of the arm. At such instant the release of the valve takes place and the time of the release may therefore be modified by moving pivots 19 and 25 farther away or closer to the eccentric-rod so as to remain longer within the domination of the tappets. For instance, in Fig. 2, if pivot 19 were raised, arm 20 will have been already disengaged from tappet 23, thus securing an earlier release of the valve. The means illustrated for adjusting these pivots are of course merely exemplifying in character and it will be readily understood that the adjustment of these pivots may be effected by suitable connections from the governor, in case the engine is to be used as an ordinary motive power engine; but the gear is of great utility in engines employed for compression and expansion purposes, as in the system of refrigeration. For instance, assume the engine to be used as a compressing and expanding engine in a refrigerating system working with air. In such case it may become desirable to have the valve-closure under control independently for each end of the cylinder. The exemplifying construction permits of this, for screws 22 and 28 may

be turned independently, thus permitting of the admission valves to have different relative closing times.

I claim as my invention—

1. In a valve gear, the combination, substantially as set forth, of an eccentric, an eccentric-rod having a pair of tappets intermediate of its length, a pair of pivoted arms in position to have their free ends engaged with and disengaged from said tappets in the course of the movement of the eccentric-rod, valve opening connections pivoted to said arms, and independent adjustable supports for the pivots on which said arms are mounted.

2. In a valve gear, the combination, substantially as set forth, of an eccentric, an eccentric-rod having tappets intermediate of its length, pivoted arms arranged to be engaged with and disengaged from said tappets in the course of movement of the eccentric-rod, rods connecting each of said arms with a steam valve of the engine, and connections from said eccentric-rod to the exhaust valves of the engine.

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