C. J. C. Petersen,

Steam-Engine Valve-Gear.

No. 22,198. Patented Nov. 30, 1858.

Fig. 1

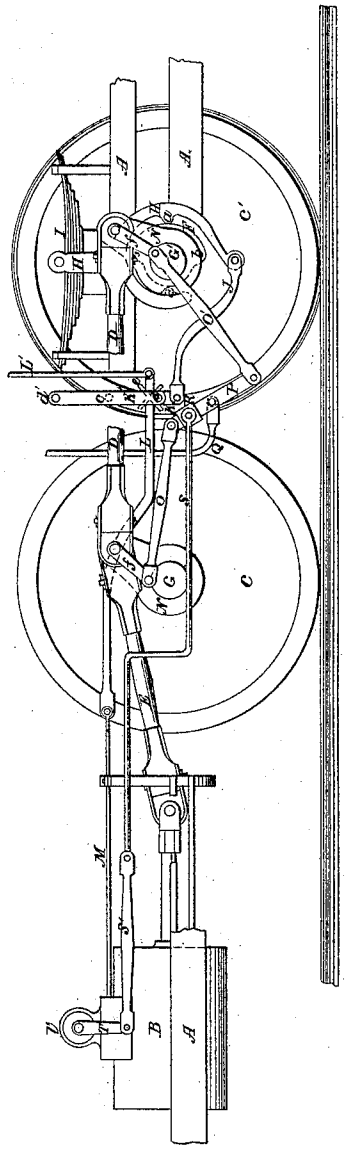


Fig. 4

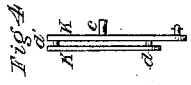


Fig. 3

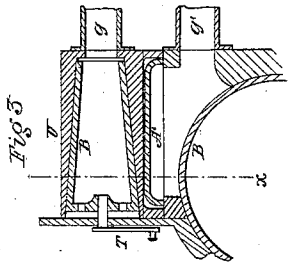
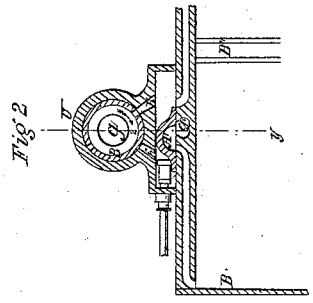


Fig. 2



A.M. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

CHARLES J. C. PETERSEN, OF DAVENPORT, IOWA.

VALVE-GEAR OF LOCOMOTIVE-ENGINES.

Specification of Letters Patent No. 22,198, dated November 30, 1858.

To all whom it may concern:

Be it known that I, CHARLES J. C. PETERSEN, of Davenport, in the county of Scott and State of Iowa, have made certain new and useful Improvements in the Valve-Gear of Locomotive-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 represents a side elevation of the valve gear of a locomotive engine constructed according to my invention. Fig. 2 is a vertical transverse section of the valve chest, *x*—*x*, Fig. 3, showing the plane of section. Fig. 3 is a vertical longitudinal section of the valve chest, *y*, *y*, in Fig. 2, showing the plane of section. Fig. 4 is a detached view of one of the parts of my arrangement.

Similar letters of reference indicate like parts in all the figures.

This invention consists first in operating the slide valve by means of an eccentric ring which is connected to the spring resting on the journal box of the axle to which the eccentric plate or cam working in said ring is attached so that the motion of the slide valve is not changed by the up and down motion of the axle. This eccentric ring is connected to a rocking piece with two steps, one below and the other above the pivot on which said piece rocks, so that the motion of the slide valve may be reversed by changing the position of the rod which connects the valve with the rocking piece, from one step to the other.

To enable others skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A, A, represent the frame of a locomotive engine; B, is one of its steam cylinders; and C, C′, are the driving wheels which are connected to each other by a connecting rod D.

E, is the connecting rod which connects the crosshead of the piston rod with the crank of the driving wheels C.

An eccentric cam F is fastened to the axle G′, of the wheels C′, and a ring H is attached to the spring I, which rests on the journal box of the wheels C′. This ring embraces the cam F, and it has two projections *a*, *a*, which correspond with projections *b*, *b*, on the cam, so that the ring is always firmly guided by the cam. To the lower end of the ring H, a rod J is pivoted, connecting with a rocking piece K, which moves on a pivot *c*. A side elevation of this rocking piece is represented in Fig. 4. A plate K′, is attached to the piece K, by means of two pivots *d*, *d*′, forming steps for a cross-shaped hook *e*, attached to a rod L, which connects with the valve stem M. The end of this rod L is pivoted to an arm L′, which connects with the reversing lever in front of the engine. The steps *d*, *d*′, are situated one below and the other one above the pivot *c*, on which the piece K works, so that they move in opposite directions, and by changing the position of the hook *e*, from one step to the other the motion of the engine may be reversed. By attaching the ring H to the spring I, a uniform motion of the slide valve is obtained; and the up and down motion of the axle G′, can have no influence on the motion of the slide valve, as by this arrangement the ring H and the cam F bear always the same relation to each other. The cam F is so shaped that the slide valve is thrown wide open when the piston arrives at one-quarter of its stroke; and the arrangement of the valves is represented in Figs. 2 and 3, in which A′ represents the slide valve, B the cylinder, B′ the cut-off valve, and B″ the piston moving in the direction of arrow 1.

The operation of the cut-off valve is effected in the following manner: Two arms *f*, *f*′, are attached to the cranks N, N′, (Fig. 1) and links O, O′, connect these arms to a slide P, which is suspended from an arm Q, which is operated by means of a lever in front of the engine. The slide P fits into a loop R, which is connected by a rod S, and link S′, to a crank T, which serves to operate the cut-off. The cut-off valve B is a rotating one, as is clearly shown in Figs. 2 and 3. The arms *f*, *f*′, are not parallel to each other, but their inner ends are equally distant from the centers of the axles G, and G′, of the wheels; and the position of the arms *f*, *f*′, in connection with the position of the slide P, regulates the point at which the steam is to be cut off. By moving the slide P up in the loop R, the position of the cut-off valve is changed so that it will be kept open longer; but in the position represented in the drawing, the cut-off takes place at one-third of the stroke.

The cut-off valve is a hollow conical valve which rotates in a chamber U, (Fig. 3) and it is operated by the crank T. Steam is ad-

mitted by the steam pipe g, and escapes through the exhaust pipe g'. The steam passes from the cut-off valve through openings h, h', h'', to the steam chest, as represented in Fig. 2, where it is shown as just commencing to move back in the direction of arrow 2; so that the opening h, has passed h', when the piston arrives at one-third of its stroke, and when the piston reaches the end of its stroke the opening h, fits over h''.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. Connecting the eccentric ring from which the slide valve is operated, to the spring which rests on the journal-box of the axle on which the eccentric plate or cam fitting into said ring is fastened, so that the up and down motion of the axles has no influence on the motion of the slide valve; the whole being arranged substantially as described.

2. Also, in combination with the eccentric ring attached to the spring, I claim the arrangement of a cam F, in connection with rods J, and L, and the rocking piece K, whereby the slide valve is thrown wide open before the piston has accomplished one quarter of its stroke, and which rods and rocking piece are so constructed that the motion of the slide valve may be reversed by raising the hook e, from one step of the rocking piece to the other one; the whole being arranged and constructed substantially as set forth.

C. J. C. PETERSEN.

Witnesses:
CHS. BEIDERBECKE,
CHAS. DELFS.