

(No Model.)

N. T. GREENE.
STEAM ENGINE VALVE.

No. 540,245.

Patented June 4, 1895.

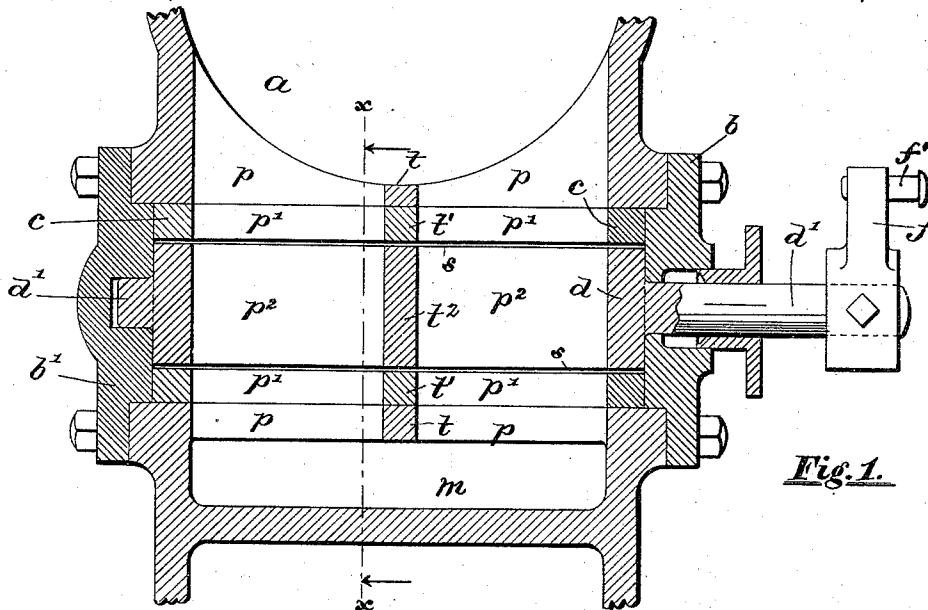


Fig. 1.

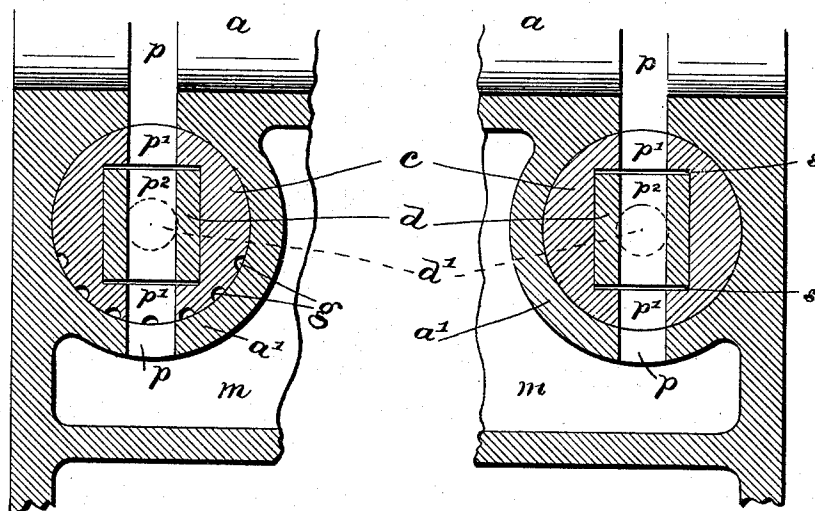


Fig. 3.

Fig. 2.

Witnesses.

Fred. Arnold.

Ida M. Warren.

Inventor.

Noble T. Greene.

by Remington & Henshaw
att'ys.

UNITED STATES PATENT OFFICE.

NOBLE T. GREENE, OF PROVIDENCE, RHODE ISLAND.

STEAM-ENGINE VALVE.

SPECIFICATION forming part of Letters Patent No. 540,245, dated June 4, 1895.

Application filed August 20, 1894. Serial No. 520,764. (No model.)

To all whom it may concern:

Be it known that I, NOBLE T. GREENE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Steam-Engine Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in steam engine valves, that is, rocking valves of the "Garland" or "Corliss" type, having curved seats; and it consists essentially in the combination with a suitably-ported valve-chest having a curved seat for the valve, of a valve, fitted to work in said seat, provided with a port extending therethrough, arranged with respect to the valve-chest port, and a suitably-mounted valve-stem or rod passing longitudinally through the valve; said rod having an opening therein communicating with and adapted to form a continuation of the valve-port and having the valve movable upon the rod, all as will be more fully hereinafter set forth and claimed.

My improved valve is well adapted to be used as a steam-valve or an exhaust-valve. I prefer to arrange the valve-chests at the ends of and at right angles with the horizontal axis of the cylinder, the chests being bored out cylindrically, each having the ports cut through the opposite walls of the chest so that when the valve is mounted therein and the ports uncovered a straight way or passage will be formed into the cylinder. By means of my improvement any loose foreign matter or substance in the cylinder will upon uncovering the port be exhausted therefrom directly through the valve into the exhaust-chest or pipe. In cylinders provided with rocking-valves as usually constructed such foreign substance is liable to pass around the valve and become lodged between it and the seat, the result being that the valve in working will become scored more or less and the smooth seat "cut," thereby producing small openings

through which steam escapes when the port is closed.

My improved valve is adapted to be worked by any well known valve mechanism, and of the positive or liberating type; and it will work with less friction and pressure than steam valves of this class as usually constructed.

In the accompanying sheet of drawings, Figure 1 is a partial transverse sectional view of a steam-engine cylinder, taken through the exhaust-port and corresponding chest, showing my improved valve mounted therein. Fig. 2 is a sectional view taken on line *xx* of Fig. 1, and Fig. 3 is a similar sectional view showing a modification of the valve-face.

In the drawings *a* indicates a steam-engine cylinder; the portion represented being one of the exhaust-chests. The said chest, *a'*, is bored out to receive and form a seat for the cylindrical-shaped valve *c*. The wall of the chest is provided at the bottom with the longitudinally extending port *p* arranged below and in line with the main-exhaust port *p* of the cylinder. In ports of medium length I prefer to stiffen them by means of the short central tie *t*. The front and back ends of the chest are faced off and provided with bonnets *b'*, *b*, respectively, arranged to receive and support the corresponding end portions of the valve-stem.

The valve proper, *c*, is cylindrical and is turned off true to fill and work in the bored chest or seat *a'*. The valve is provided centrally with a rectangular-shaped hole extending throughout its length, from end to end. It is also provided with upper and lower longitudinally-extending openings or ports *p'*, *p'*, communicating directly with the ports *p*, *p*, and said central opening; a tie *t'* dividing the ports longitudinally, as clearly shown in Fig. 1. The valve-stem *d* is fitted to and practically fills the central opening formed in the valve, its end portions being turned down to form supports or journals *d'* fitted to work in the said bonnets. These end portions, or journals, project beyond the ends of the valve and are centered in the bonnets. Thus it will be apparent that while the valve-stem is mounted to rotate in fixed bearings the valve itself will rotate on its own seat through the

medium of the stem, even though the longitudinal axes of both are not in exactly the same plane; as for example, in case the valve surface becomes worn somewhat. A space or clearance *s* is formed between the upper and lower sides of the stem portion *d* and the adjacent faces of the said central opening in the valve, as clearly shown.

The valve may be worked in any well-known manner, as for example, by means of a suitably mounted connection jointed to the pin *f'* of the crank-arm or lever *f* fixed to the valve-stem.

The valve may be provided with a series of longitudinally extending shallow grooves *g* cut into its working surface, as shown in Fig. 3. These grooves serve to lessen the working friction in that they form a series of small lubricant-holding reservoirs.

In my improved valve the ports form a direct passage from the cylinder into the usual chamber *m*, the area of said passage or port transversely being substantially uniform throughout.

While the drawings represent my improvement adapted to the exhaust-valves of an engine, it is obvious that the device may be equally applicable to the steam valves, without departing from the spirit of the invention.

I claim as my invention—

1. The steam-engine valve, substantially as hereinbefore described, consisting of the cylindrical valve portion proper, as *c*, having an enlarged central opening extending longitudinally therethrough and ports *p'* communicating therewith cut through the valve arranged to form a passage transversely through the valve and adapted to work in a fixed ported chamber forming a seat for the valve, and the mechanically movable ported stem mounted

in and extending through said central opening of the valve provided with turned ends arranged to be supported in the valve-chamber bonnets constructed and arranged whereby all the said ports are in communication with each other when the fixed or stationary ports are uncovered.

2. In an engine cylinder, provided with a bored valve-chest having fixed ports, as *p p*, cut through its walls and communicating with the interior of the cylinder and end bonnets or covers, as *b, b'*, the combination therewith of the valve *c* seated in said chest having a main port *p'* extending transversely there-through arranged to communicate with the said valve-chest ports, and a stem or rod extending centrally and longitudinally through and adapted to operate the valve and mounted to rotate in said bonnets; said rod having an opening or port therein communicating with the several valve ports, and arranged to be mechanically actuated.

3. In a steam-engine cylinder, the combination with a bored valve-chest provided with suitably arranged ports and bonnets, of a self-seating ported valve fitted to work in said chest and a mechanically actuated ported stem or rod passing through the valve longitudinally and arranged to work in the valve-chest bonnets, whereby upon uncovering the cylinder-port a free passage is opened directly through the valve and said ported stem for the full flow of steam, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

NOBLE T. GREENE.

Witnesses:

GEO. H. REMINGTON,
IDA M. WARREN.