W. H. GARRECHT.

SAFETY-VALVE ATTACHMENT TO UTILIZE WASTE STEAM.

No. 192,329. Patented June 26, 1877.

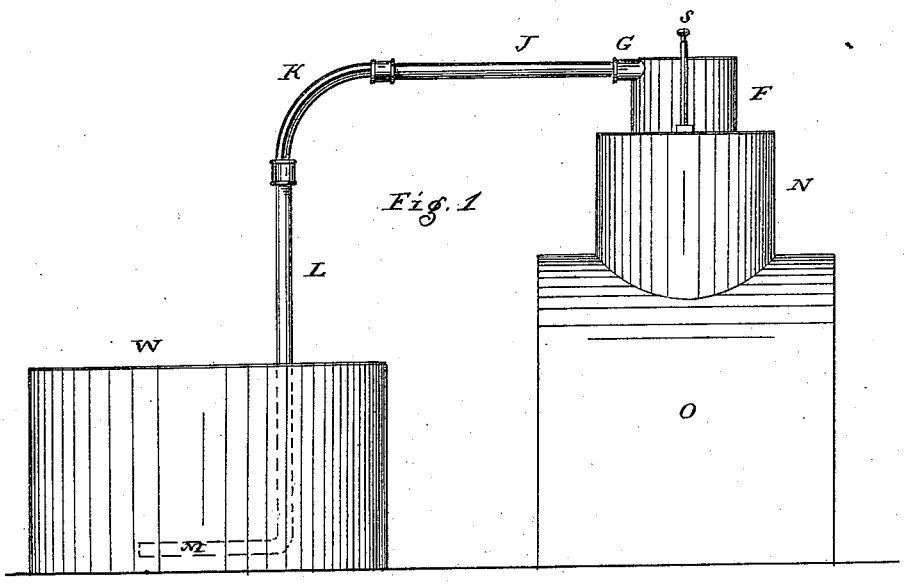


Fig. 1

Fig. 3

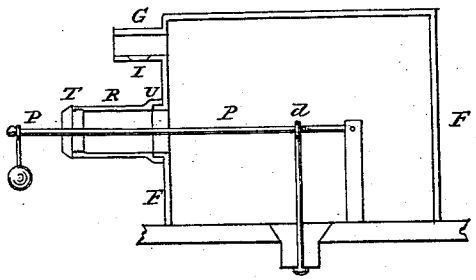
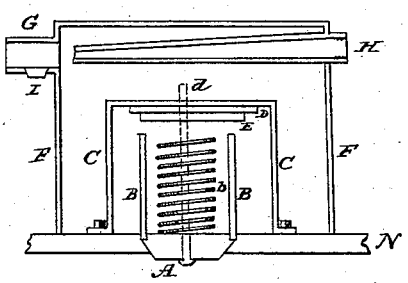


Fig. 2



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM H. GARRECHT, OF LANCASTER, PENNSYLVANIA.

IMPROVEMENT IN SAFETY-VALVE ATTACHMENTS TO UTILIZE WASTE STEAM.

Specification forming part of Letters Patent No. **192,329**, dated June 26, 1877; application filed May 21, 1877.

To all whom it may concern:

Be it known that I, WILLIAM H. GARRECHT, of the city of Lancaster, in the county of Lancaster, State of Pennsylvania, have invented certain Improvements in Locomotive Engines, of which the following is a specification:

This invention relates to that class which has for its object, first, to utilize the waste steam usually blown off into the air with a great noise while the engine is stationary in a depot or on a siding; second, to prevent this loud and shrill noise of steam, so prone to frighten horses, having occasioned many serious accidents, resulting in heavy damages. This utility and prevention is attained by a simple arrangement of a bonnet over the ordinary safety-valve adapted for the purpose, and, by means of pipes and couplings connected with the bonnet, the steam is conveyed direct into the water-tank, as herein more fully set forth.

The accompanying drawing, with the letters of reference marked thereon and a brief explanation, will enable those skilled in the art to make and use the same, and in which—

Figure 1 shows the boiler with the bonnet and its pipe-connection with the water-tank. Fig. 2 illustrates the safety-valve and appliances in one form. Fig. 3 shows a modification of the bonnet to adapt it for the lever to a valve.

My invention consists of a safety-valve, having a stem and coiled spring secured under a bridge-piece, with the lock-bolts and tubes surrounding the same, as found in common use on the domes of locomotive-engines. My improvement to this arrangement consists in attaching a cylinder, B, around the valve-plate A, with its beveled edge in its seat upon the top of the dome. I also secure a circular disk or plate, D, to the under side of the cross or bridge piece C. Over the valve, to prevent back-pressure on the top, and on the under side of said disk, I affix an elastic disk, E, of gutta-percha, the stem *d* of the valve passing through central perforations, so that when the valve A is lifted from its seat it is arrested at the proper point by bringing the upper edge of the cylinder B squarely against the elastic cushion or disk E, and causes the steam to enter a covering-bonnet, F, that sets over the safety-valve herein mentioned. This bonnet may be of cast or boiler iron, fitted by its lower edge to the top of the dome, and held in place by means of a screw-clamp, S, and side lugs provided for the purpose. To the upper portion of this bonnet, on the side facing the water-tank, a tube, G, may be cast, having a screw-thread cut into the outer end, and provided with a seat on the lower side for a vacuum-valve, I, to guard against reaction.

When applied to valves with lever-arms, the bonnet can be adapted by an extra elastic coupling with the lever-arm, and provision made for it, as shown.

I propose to use a two-inch pipe, J, of sufficient length, in a horizontal position, and connected to a vertical pipe, L, by means of hose or elastic couplings K. Said vertical pipe L may be provided with a stuffing-box where it enters the tank, and carried down to near the bottom of the same, and, by an elbow-coupling, carried horizontally by M, as shown.

By this simple device the escaping steam through the valve A is conveyed from the bonnet, through the pipes, directly into the water-tank, where it is condensed, and at the same time imparts its heat to the water within the tank, without noise, thus utilizing the otherwise lost steam, and performing the double purpose claimed.

During a prolonged stopping an excess of heat might be given off. This could be remedied by using a worm-tube in the tank, opening outward above, that when brought to a boiling-heat, so as no longer to condense the steam, it may pass off simply in the form of vapor. I, however, make use of a conic tube, H, in the upper portion of the bonnet, one end opened or closed at pleasure on the outside to admit air, the inner narrower end opening in front of the tube G, on the inside of the bonnet. This would tend to reduce the heat. So, also, should it be desirable to have a relief-rigging to operate the valve from without, it can readily be accomplished without interfering with the functions of the pipes, bonnet, and safety-valve, as and for the purpose designed, namely, to prevent the noise and to utilize the heat otherwise lost from the blow-off.

I am aware that closed hoods over safety-

valves are used connected to the ordinary standards in use, to which pipes are connected, leading down over the side of the boiler, and connected with a horizontal pipe, such as the ordinary feed-water pipe leading from the pump to the tank, or extended to beneath the engine, and carried and entered through the bottom of the tank, as seen in Patents No. 181,624, or No. 186,783, arrangements which I do not use or claim. My arrangement differs substantially by connecting the open cylinder with the valve, and only connecting my covering-disk, with its rubber disk, with said standards, the whole under my independent bonnet, and which is not strictly closed, but supplied with a conic tube to obviate a vacuum-valve, and said bonnet is simply attached by a clamp-screw, and has no actual connection with the parts of the valve, the pipe also being free from contact with the engine, and entering the tank vertically from above it; therefore,

What I claim as my improvement is—

The combination of the bonnet F, when provided with an interior conic tube, H, a horizontal pipe-connection, G J, to a hose-coupling, K, and vertical pipe L, entering the water-tank from above, said bonnet being secured by a simple clamp, lugs, and binding-screw S, disconnected from, but covering, the safety-valve A, cylinder B, and united disks D E, the whole arranged substantially as and for the purpose specified.

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Witnesses:
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