No. 862,826. PATENTED AUG. 6, 1907.

H. KIEREN.

ANGLE BLOW-OFF VALVE.

APPLICATION FILED APR. 10, 1906.

Fig. 1.

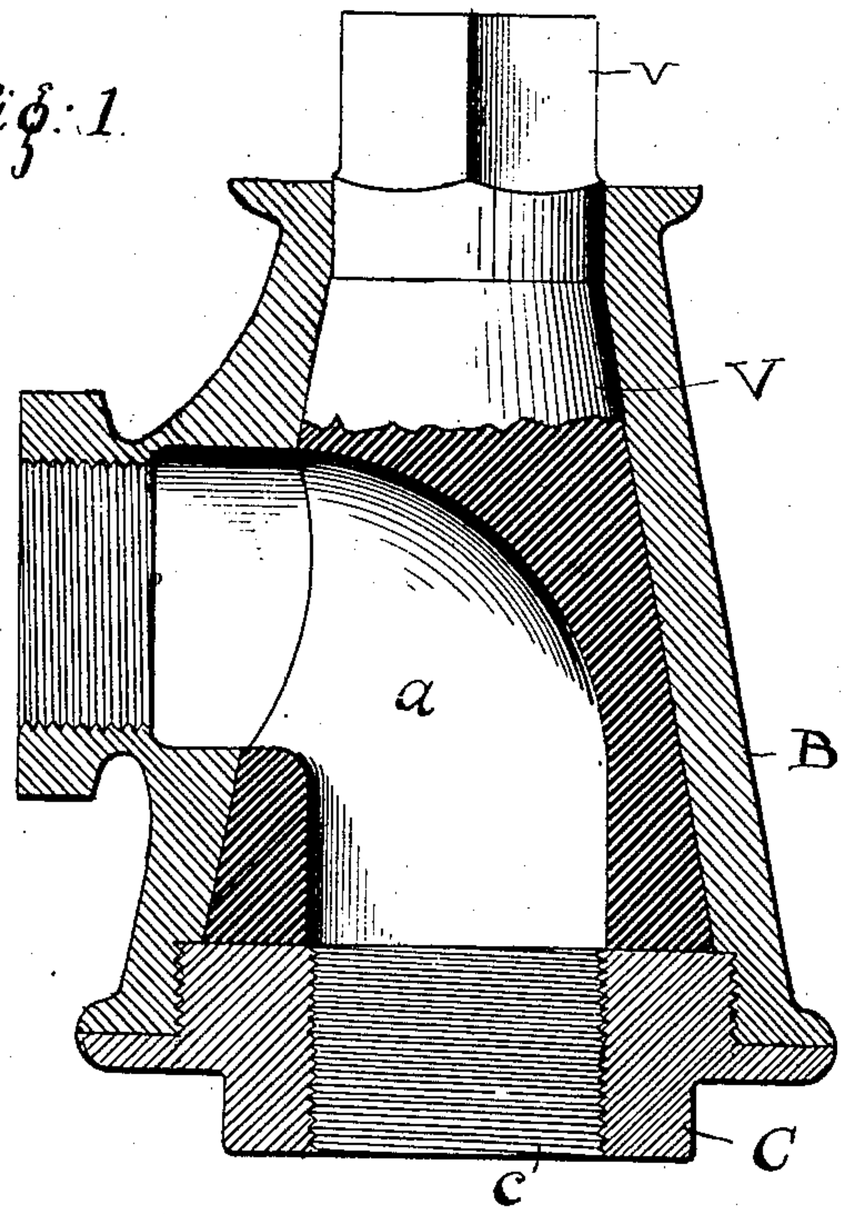
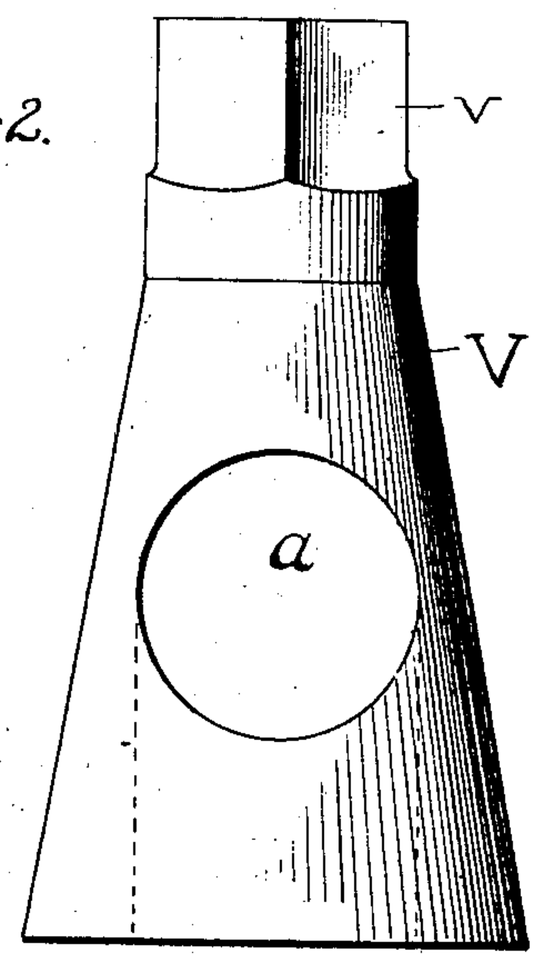


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY KIEREN, OF CRYSTAL FALLS, MICHIGAN, ASSIGNOR OF ONE-HALF TO FRED H. MILLER, OF CRYSTAL FALLS, MICHIGAN.

ANGLE BLOW-OFF VALVE.

No. 862,826. Specification of Letters Patent. Patented Aug. 6, 1907.

Application filed April 10, 1905. Serial No. 254,663.

To all whom it may concern:

Be it known that I, HENRY KIEREN, a citizen of the United States, residing at Crystal Falls, in the county of Iron and State of Michigan, have invented certain new and useful Improvements in Angle Blow-Off Valves; and do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to angle blow-off valves, and the invention consists in the construction and combination of parts, substantially as shown and described and particularly pointed out in the claims.

In the accompanying drawings Figure 1 is a longitudinal sectional elevation of my improved valve, and Fig. 2 is a side elevation of the plug therein.

In order to remove from steam boilers the constantly accumulating scale and other impurities formed in the water by the process of steam making, there is connected to the lower part of the rear end of the boiler an outlet pipe extending outside the fire-room. In the line of pipe near the boiler is placed a so-called blow-off valve by the operation of which, when open, the water in the boiler carrying this sediment can be blown out; when closed tightly all leakage or waste is stopped.

The blowing out process ordinarily should occur once or twice daily to keep the boiler clean and prevent the connecting pipe from burning out, as the sediment works down and soon would fill it to the exclusion of any water, thus allowing the direct contact with the fire to do it damage and endanger the control of the boiler.

The blow-off valve, which is thus often used and constantly under pressure should be of such construction that it would be powerful enough to withstand the boiler pressure; that its seatings would be maintained with such an exact fit that when closed all leakage would be prevented, and that the action of steam, water, or scale and other impurities carried in the water might not soon ruin or damage them, compelling frequent repairs, expense, and interruption of the services of the boiler.

In angle plug blow-off valves now in common use, a water tight engagement is sought to be made by means of bolts, nuts, or the like exerting a great pressure on the top or large end of the plug so as to force and hold the plug tightly upon its seating, and thus making the plug fit so tightly into the outer shell that there may be hope that in rotating the plug the scale or other abrasive substances will be excluded and thereby prevent cutting the seatings to the loss of the effective services of the valve.

As one result of the liability of the ordinary angle blow-off valve now in use to damage by frequent use it may be said that many boilers are not blown out as often as their condition require, in order to minimize the expense and vexatious labor of taking apart the line of discharge pipe and renewing the valve.

In the angle blow-off valve herein shown, all the objections of the ordinary valves are overcome and avoided by reason of its peculiar construction. Thus, the valve body B and the plug or valve proper V are provided with a smooth curved passage *a* through the same, and said passage is so formed that it allows no projections, cavities, pockets or irregular obstructions of any kind upon which there may be lodgment of scale, sediment, or other abrasive matter and where the same might solidify or harden and do damage to the seatings of the valve.

A cap C confines the plug and it is to be noticed as a peculiarity of this invention that the passage *a* is through this cap and the large end of the plug, and that the seating of the plug is never exposed to direct contact with the hot water carrying said impurities, and that only a portion of the seating on the valve body equal to the area of the outlet in the plug is ever exposed to said water, and even then to no damage because it is only at a time when the valve is closed and the opening in the plug lies against the upper part of the seating in the valve body, so that by force of gravitation the scale and sediment in the hot water falls away from said seating and is not incrusted thereon.

The plug V is held securely upon its seat by pressure from the boiler whether little or great, which pressure is of an elastic nature and not an unyielding hard force as would be exerted by bolts, nuts, threads, and the like, and which force often exceeds many times that of the steam power in the boiler, thus compelling unnecessary and useless wear on the valve.

The plug as shown has a seating or bearing upon its entire circumference within the valve body or shell both above and below its one outlet which effectually prevents leakage and adjusts itself to wear, and the squared portion or stem *v* extending outside the valve body provides for operation by means of a handle or wrench.

The seatings being kept free from abrasive substances there is ease of operation, and a uniformly tight valve not easily damaged and offering long effective service.

The cap has a threaded interior *c* to receive a threaded pipe, not shown, and serves in a measure as a carrier for the plug although the plug is not seated thereon or held to its seating by the same. Rather the pressure of the steam upon the curved surface of the valve holds the valve closely upon its seat.

The construction of the several parts of the valve are such that the effect of pressure is to solidify or bind them together, and the frequent use of the said valve perfects the seating, thereby providing a safe, easily operated, practical, long lived valve.

While the valve is primarily intended for use as a

blow-off valve it is not necessarily limited to such use, as is obvious.

An entrance is made through the large end of the hollow plug in order to utilize the pressure from the boiler in holding the plug firmly upon its seating, for should the entrance have been made through the small end of the plug the effect of the pressure would have been to force the plug away from its seating and tend to cause leakage through the outlet passage, even if by the use of packing, leakage did not occur around the stem.

By the absence of nuts, bolts, glands, packing, set screws and the like this valve adjusts itself readily to changes in the temperature of water carried, expanding or contracting to suit the occasion unfettered by arbitrary forces that might often cause it to bind, set solid and refuse to work were they used. Hence, no valve is necessary intervening between it and the boiler to cut off the pressure and permit taking same apart to make readjustment of its parts at intervals.

By the absence of set screws, rings and other small parts that might be used in the interior of the valve, corrosion that could reasonably be expected is all avoided.

What I claim is:—

An angle blow-off valve for the purpose specified, comprising a body formed with an interior taper terminating at its larger end in an interiorly threaded cylindrical portion of sufficiently larger diameter than the said larger end to form an outwardly facing shoulder connecting the threaded cylindrical portion with the said larger end of the interior taper, said interior taper constituting a valve seat, and a solid tapered valve fitting snugly within the said body and extending from the said shoulder throughout the length of the taper, said valve being provided with a passage commencing at the center of its larger end and extending longitudinally and laterally in a curved direction and opening at its other end out of the side of the said valve, said passage being of uniform diameter throughout and the valve body being provided in one side with an outward passage of the same diameter as the passage through the valve, the two passages being adapted to register, and the said valve being a solid structure above the outlet passage in the valve body, and a cap screwed into the larger end of the valve body with its threads engaging the cylindrical threaded portion above mentioned, the said cap being provided with a centrally located opening coinciding and coextensive with the passage through the valve, the inner face of the said cap being plane and abutting snugly against the outer or larger end of the valve throughout the solid portion thereof and of such an extent as to project beyond the periphery or side of the valve whereby to coact with the aforesaid outwardly facing shoulder in the valve body, whereby the joint between the cap and the valve body is located an appreciable distance outside of the joint between the valve, the valve body and the cap, and the last named joint is thereby rendered perfectly smooth as well as tight, the entire valve body being filled with the valve and cap solidly, except as to the passage in the valve and the opening through the cap and side opening through the valve body, all as herein before set forth.

In testimony whereof I sign this specification in the presence of two witnesses.

HENRY KIEREN.

Witnesses:
FRED. H. ABBOTT,
FRED H. MILLER.