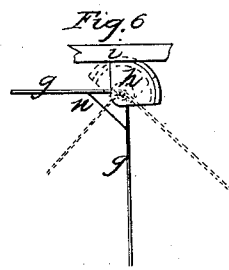
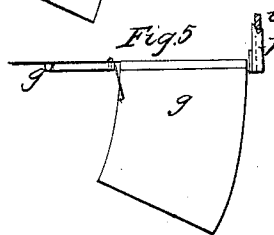
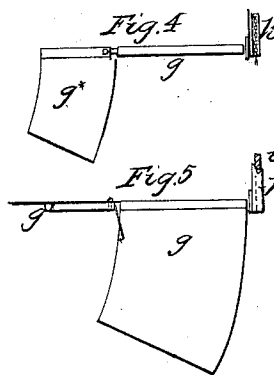
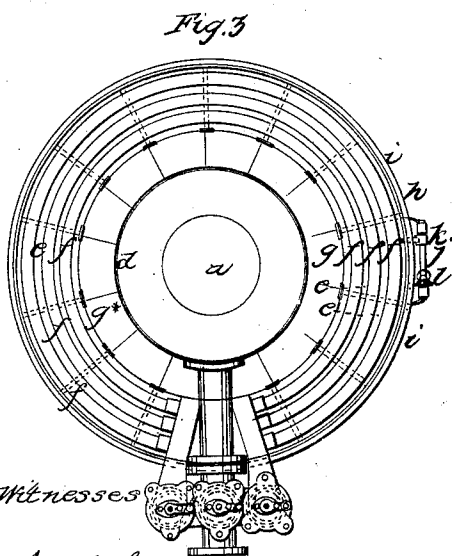
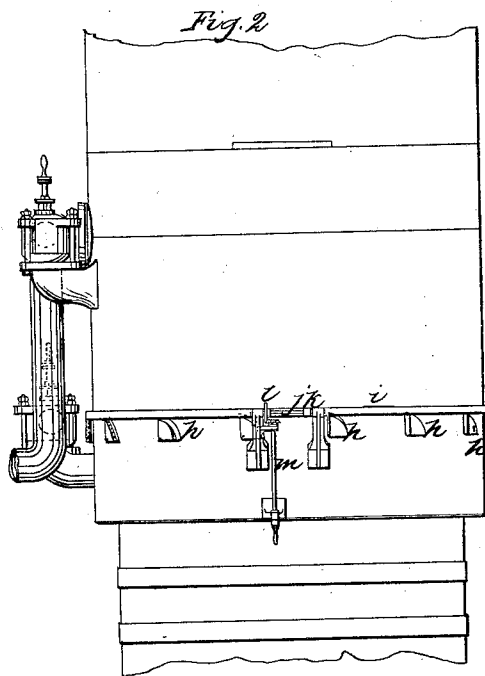
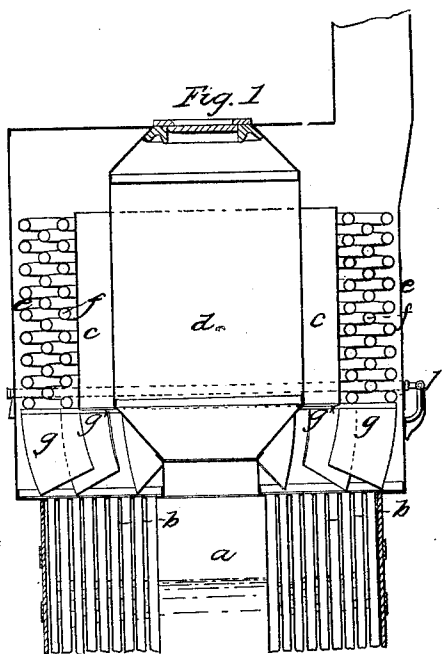


W. L. & T. Winans,
Steam-Boiler Superheater.
N^o 58,038. Patented Sep. 11, 1866.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM LOUIS WINANS AND THOMAS WINANS, OF LONDON, ENGLAND.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. 58,038, dated September 11, 1866.

To all whom it may concern:

Be it known that we, WILLIAM LOUIS WINANS and THOMAS WINANS, of London, England, have invented Improvements in the Arrangement of Apparatus for Superheating Steam in Steam-Boilers; and we do hereby declare that the following is a full and exact description of our said invention.

This invention of improvements in the arrangement of apparatus for superheating steam in steam-boilers consists in arranging the superheating apparatus in the manner described, so that the admission of the heated gases, which pass from the fire-place through the tubes to the superheater, may be regulated by the attending engineer, so as to cause the whole or any desired proportion of the heated gases to pass through the superheater, or so as to cause the whole of it to pass directly to the chimney without entering the superheating apparatus, by which means the steam may be heated to any practically-useful degree of temperature.

To this end the superheating apparatus is placed in the smoke-box or in the uptake, or in any suitable and convenient place in the flue or passage between the fire-place and the chimney, and is provided with a valve or valves, whereby the admission of the heated gases from the fire-place into the superheater may be regulated at pleasure.

By means of the valve or valves the hot air or gases, after passing from the fire-place through the flue-tubes of the boiler, may be made to pass either through a passage communicating directly with the chimney, or they may be made wholly or partly to pass through the superheating apparatus.

By this arrangement of apparatus and the proper adjustment of the valve or valves the steam may be kept constantly superheated to any required and useful degree of temperature, and, when it is preferred not to use superheated steam, the hot air or heated gases may be shut off from the superheating apparatus by closing the valve or valves which open the communication between the superheater and the flue or passage.

By this arrangement of apparatus the hot air or heated gases may be shut off from the superheater when steam is being got up in

the boiler and when the machinery is at rest and no steam is passing through the superheater. Therefore the tubes and other parts of the superheating apparatus will not be damaged by becoming overheated when not in use.

In the accompanying drawings, at Figure 1, the superheating apparatus is shown as applied to a vertical tubular boiler; but only so much of the boiler is shown as is necessary to show the application of the present invention. Fig. 2 is an external elevation of the same; and Fig. 3 is a sectional plan view of the same.

The particular form of vertical tubular boiler to which we have shown the invention as applied is one that we have invented, and for which we have obtained Letters Patent.

The boiler has a vacant space, *a*, Fig. 1, in the center, for the convenience of allowing a man to get down and examine and clean the internal parts of the boiler, and to give a free and better circulation of the water in the boiler, as described in the specification of the other Letters Patent, above referred to. This space is surrounded by the flue-tubes *b b*, up which the heated vapors and gaseous products of combustion pass, either directly to the chimney through the open annular space *c c*, which surrounds the steam-dome *d*, or they may be directed through the superheating-chamber *e*, in which are arranged a series of circular tubes, *f f f*, which communicate with the upper part of the boiler, so that steam is caused to circulate therein and be superheated when required.

Beneath the open end of the superheating-chamber are arranged a series of valves, *g g g*, mounted on spindles, which also carry other valves, *g^x g^x g^x*, for closing the entrance to the annular space *c* when it is required to direct the heated gases into the superheating-chamber. At the outer ends of these valve-spindles are mounted the sector-pieces *h h h*, as seen best in the detached plan, front, and end views, Figs. 4, 5, and 6, of these valves and their appendages.

The sector-pieces *h* are connected by chains or metal bands to a ring, *i i*, which surrounds the boiler, as seen best in Fig. 2, and is supported on the sector-pieces, on which it simply rests, as seen in Figs. 5 and 6, so that it may be moved round horizontally in either direc-

tion, in order to act on the spindles of the valves $g g$, and thereby raise or lower the latter. This horizontal motion of the ring i is effected by means of a tangent-screw, j , which is supported in brackets secured to the sides of the boiler. On this tangent-screw is mounted a stud-block, k , and it is provided at one end with a bevel-wheel, l , which is driven by a similar wheel on the upper end of the vertical shaft m , which is provided at its lower end with a winch-handle, whereby it may be turned in either direction.

It will be understood from the foregoing description that by closing the valves $g g$ the heated vapors will be prevented from entering the superheating apparatus, and consequently the steam in the circular pipes or tubes $f f$ will simply be common steam.

The operation of the several parts will be as follows: Supposing it be desired to superheat the steam which is circulating in the pipes or tubes $f f$, the valves $g g$ will be open and hang down in the position shown in Figs. 1 and 5, and at g in Fig. 6, the smaller valves $g^* g^*$ being brought into the position shown in the figures in order to close the lower end of the circular space c and prevent the heated gases from passing through the same. The heated gases from the fire will therefore pass up into the superheating-chamber, and will circulate among the tubes $f f$, which will abstract a portion of the heat therefrom.

It will be seen, on referring to Fig. 6, that the two valves g and g^* are connected together by a link, n , and therefore these two valves must always work together.

If it be desired to put the superheating apparatus out of work this object may be effected by simply turning the winch-handle at the end of the vertical shaft m , so as to move the ring

i around, and thereby cause the spindles of the valves g and g^* to turn on their axes, thereby closing the valves g and opening the valves g^* . The heated gases will then be prevented from passing up into the superheating-chamber, but will be forced to ascend through the annular space c and pass direct into the chimney.

It will therefore be understood that the superheating of the steam will be entirely under the control of the engineer in attendance, as the heated gases may all be made to pass into the superheating-chamber, or all into the annular space, or both these channels may be partially open, as indicated by dots in Fig. 6, so that part of the heated gases will pass through the one space and the remainder through the other.

Having now described our invention and the manner of carrying the same into effect, we claim—

The combination and arrangement of the valves g , valves g^* , sector-pieces h , ring i , tangent-screw j , block k , bevel-wheel l , the circular tubes f , dome d , space a , tubes b , whereby the heated vapors may circulate among the tubes f or pass through the space c surrounding the dome, as may be desired, substantially as described, for the purpose specified.

In witness whereof we, the said WILLIAM LOUIS WINANS and THOMAS WINANS, have hereunto set our hands and seals the 20th day of January, 1866.

WM. L. WINANS. [L. S.]
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