

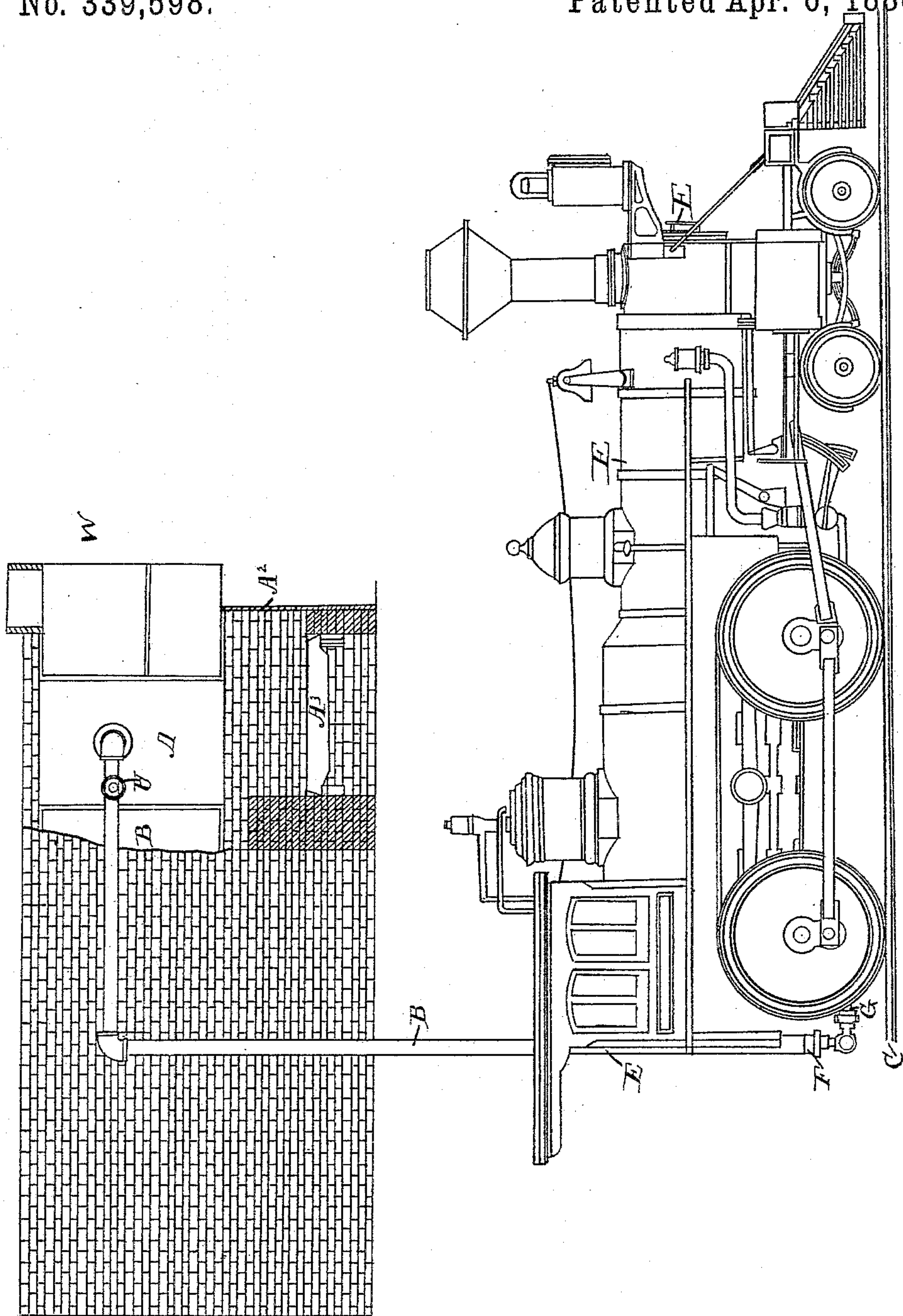
(No Model.)

W. TITCOMB.

PREVENTING BOILER EXPLOSIONS.

No. 339,598.

Patented Apr. 6, 1886.



Witnesses:

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# UNITED STATES PATENT OFFICE.

WINSLOW TITCOMB, OF WATERVILLE, MAINE.

## PREVENTING BOILER EXPLOSIONS.

SPECIFICATION forming part of Letters Patent No. 339,598, dated April 6, 1886.

Application filed December 18, 1885. Serial No. 186,068. (No model.)

*To all whom it may concern:*

Be it known that I, WINSLOW TITCOMB, a citizen of the United States, residing at Waterville, in the county of Kennebec and State of Maine, have invented certain new and useful Improvements in Preventing Boiler Explosions; and I do 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 drawing, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention consists in the method hereinafter described of preventing boiler explosions by reducing the liability of steam-boilers to crack and leak after filling the same; and it consists in filling them with hot water and steam under pressure, substantially as hereinafter described.

One of the principle causes of the deterioration of steam-boilers, and particularly of locomotive-boilers, is believed to be the cracking of the inner walls of the fire-box or water-legs of the boiler, and the loosening of the stay bolts and tubes in the boiler, caused by filling the boiler after cleaning or blowing off with cold water, and then making a very hot fire to heat the water quickly. The cause of the cracking and opening above referred to is the unequal exposure of the boiler and its tubes to the heat, the surfaces directly exposed to the flames being more rapidly expanded than other parts not so exposed. The operation of raising steam is hastened by the use of highly combustible fuel—such as oil, tar-barrels and similar material; but the more the fire is forced the greater is the liability to crack the inner walls of the fire-box.

When a locomotive-boiler has been blown out and refilled with cold water several hours must be spent in raising steam, the locomotive of course being useless in the meantime. To remedy the evil above described, when the boiler is empty, or immediately after cleaning out the boiler in the usual manner, instead of filling the same with cold water, I fill the boiler with steam and hot water under pressure by any convenient means. The steam so forced into the boiler instantaneously fills and

heats uniformly every part of the same, including the tubes and the walls of the fire-box, and if now a fire be started in the fire-box the engine will soon be in a condition to run, and may run at once if the steam and water be forced in at a sufficiently high pressure and temperature. I thus avoid the loss of time commonly consumed in getting steam, and the great expense and delay, and sometimes danger, caused by the cracking, leaking, and bursting of locomotive-boilers when filled and heated in the usual way, besides effecting a considerable saving of fuel.

The accompanying drawing illustrates my invention, and represent a locomotive-engine standing on the track, a stationary boiler set in brick-work (a part of the brick-work being cut away to show the boiler and fire-grate,) and a pipe leading from the stationary boiler to the blow-off cock of the locomotive.

In carrying my invention into practice I may use for filling the boiler of the locomotive-engine a stationary boiler, A, of the usual construction, and set in brick-work A', above a furnace, A<sup>2</sup>, the grate-bars of which are shown at A. The boiler A is preferably located in the round-house where the engine is cleaned, or where it is kept when not in use, and from this boiler A a pipe, B, is carried to a point over track C, onto which the locomotive may be run to be filled. The pipe B is provided with the stop-valves D, of usual construction. The end of the pipe B farthest from the boiler A is secured by a union joint or coupling, F, of ordinary construction, to a short pipe attached to the blow-off cock. The boiler A should be of sufficient capacity to fill one or more locomotive-boilers, and should be constantly filled with steam at a high pressure, say, a pressure of sixty pounds or upward to the square inch. When the pipe B is connected with the feed-pipe, as above explained, the valve D is opened and steam and hot water from the boiler are driven through said pipe into the locomotive-boiler until the same are supplied. The pipe B leaves the boiler A below the water-line W.

One locomotive-boiler may be filled from another by connecting the blow-off cocks, and in ordinary cases this is the method which would be adopted in preference to using a stationary



boiler. When this method is employed the injector of the filling-boiler is kept running while the operation of filling is going on, so that the supply of steam and hot water in the  
5 said boiler does not become exhausted.

A nest or series of stationary boilers located near each other may be filled one from another substantially as the locomotive-boiler is filled from a stationary boiler in the foregoing description, requiring the raising the water from  
10 a low temperature to the boiling-point in one of the boilers only, thus exposing only one of the boilers to the danger of cracking and opening above referred to.

15 It is evident that by the use of my invention a great saving of fuel and time is effected over the ordinary mode of making steam from cold water, as now practiced.

I am aware that heretofore portable hot-water receptacles on street-railroad cars have  
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been supplied with hot water from stationary boilers, and that said cars have also been provided with means for keeping said water heated to the initial point to produce a motive power.

I claim as my invention—

The method or process herein described of decreasing the liability of steam-boilers to crack, leak, and explode by filling them with hot water surcharged with steam under pressure before starting the fire, substantially as described, and for the purpose specified. 30

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

WINSLOW TITCOMB.

Witnesses:

H. D. BATES,  
S. W. BATES.