

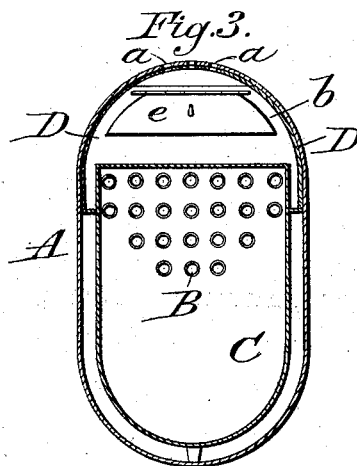
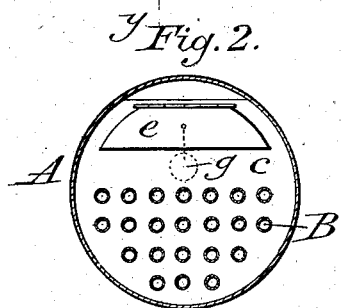
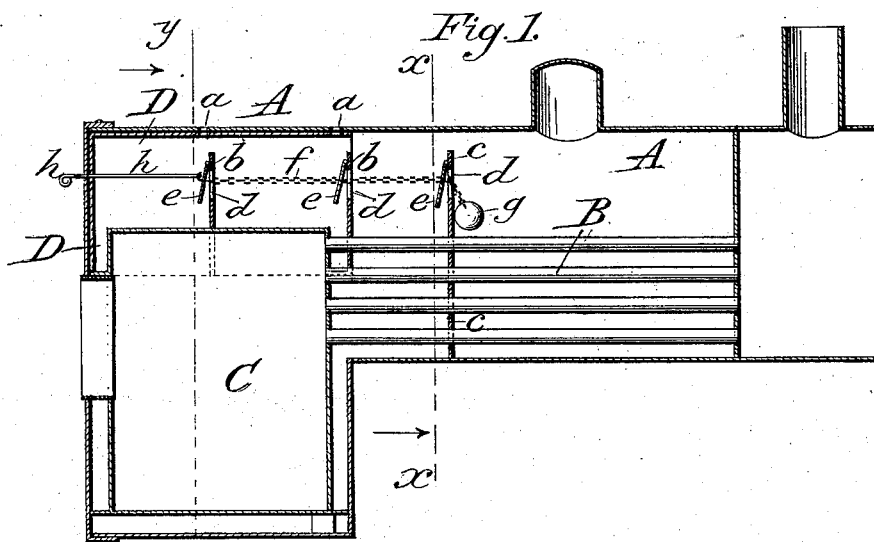
(No Model.)

J. E. KRUMM.

CROWN SHEET PROTECTOR FOR STEAM BOILERS.

No. 261,730.

Patented July 25, 1882.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN E. KRUMM, OF TURBOTVILLE, PENNSYLVANIA.

CROWN-SHEET PROTECTOR FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 261,730, dated July 25, 1882.

Application filed November 23, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. KRUMM, a citizen of the United States, residing at Turbotville, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Crown-Sheet Protectors for Steam-Boilers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in devices for protecting the crown-sheet of fire-boxes in steam-boilers; and it consists in the combination of a water-tank placed above and around the crown-sheet, having suitable partitions provided with valves and a partition in the cylindrical part of the boiler provided with a valve, with an ordinary form of steam-boiler, the object being to protect the crown-sheet from excessive heat of the fire by keeping the water over and around the same when the boiler is in an inclined position, as will be hereinafter more fully described.

In the annexed drawings, Figure 1 is a vertical longitudinal section of a locomotive steam-boiler with my improvement applied thereto. Fig. 2 is a transverse section of the same on line *x x* of Fig. 1, and Fig. 3 a similar section on line *y y*.

A represents the boiler, provided with the usual tubes, B, and fire-box C.

D is a water tank, cap, or box resting on top of the fire-box C—that is, immediately on the crown-sheet—and it extends the whole width of the boiler and down the sides of the fire-box, as shown, a greater or less distance, as found convenient. This tank D may be nearly closed at the top, or entirely so, as shown in the drawings, and has perforations *a a* in its top for the escape of steam. One or more vertical partitions, *b*, extend entirely across said tank D and divide it into two or more compartments, as shown. The front end of the tank is attached to the flue-sheet, as shown in Fig. 1.

c is a transverse vertical partition or plate extending entirely across the boiler in its cylindrical portion at about one-fourth the distance (more or less) from the fire-box. The tubes B pass through holes in this plate. The partitions *b*, front wall of tank, as well as

plate *c*, extend to within a short distance of the top of the boiler and about two inches above the water-line, and have openings *d* near their tops, provided with flap-valves *e*, arranged so as to open and let the water pass through when the front or flue end of the boiler is raised higher than the fire-box end, and close and hold the water back in the compartments in the tank when the front end becomes lower than the fire-box end. These valves *e* are connected by a chain or rod, *f*. To the valve in the partition *c* is suspended a weight, *g*. When the boiler A is on a perfect level the valves *e* will not be quite closed, water being in the compartments of the tank and around the tubes B, the steam formed therefrom passing out through the apertures *a a* in the top of the tank. A valve-rod, *h*, extends from the partition *b* nearest the rear end of the boiler through the same, by the use of which the operator can open and hold open the valves *e* at will. The valves all work automatically, and the rod *h*, chain *f*, and weight *g* may be dispensed with, if desired; but the instant the front end drops lower than the rear end the weight and the valves with it will move forward, and all will be closed, assisted by the pressure of the water. Said weight *g* is to be of such heft as experience may show to be proper, and is not calculated to control the action of the valves, which, like that of the weight itself, is automatic, but to render their action more positive.

My invention is more especially designed for locomotive-boilers; but it may be applied to other forms of boilers, if desired.

As before stated, when the locomotive is going downgrade the valves close and confine the water in the tank around the crown-sheet, and also in the compartment formed by the plate *c* and the fire-box, thus protecting the crown-sheet and the portion of tubes nearest the fire from excessive heat.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A device for protecting the crown-sheet of a boiler, consisting of a water tank or box, D, having partitions *b*, said partitions having openings *d* and valves *e*, connected by a chain

or rod, *f*, weight *g*, valve-rod *h*, and apertures
a a for escape of steam, placed on top of the
fire-box and extending a suitable distance
down the sides of the same, substantially as
5 shown and described.

2. In a steam-boiler, the fire-box C and tubes
B, in combination with a water-tank, D, hav-
ing apertures *a a* in its top, partitions *b*, ex-
tending slightly above the water-line, and hav-
10 ing openings *d* and valves *e*, connected by chain

f, valve-rod *h*, and partition *c*, having opening
d and valve *e*, provided with a weight, *g*, and
chain *f*, substantially as shown, and for the
purposes described.

In testimony whereof I affix my signature in 15
presence of two witnesses.

JOHN E. KRUMM.

Witnesses:

D. W. DENNIS,

WM. F. DERR.