

W. F. KIESEL, JR.
 SUPERHEATER FOR STEAM GENERATORS.
 APPLICATION FILED JAN. 9, 1911.

1,061,180.

Patented May 6, 1913.

2 SHEETS—SHEET 1.

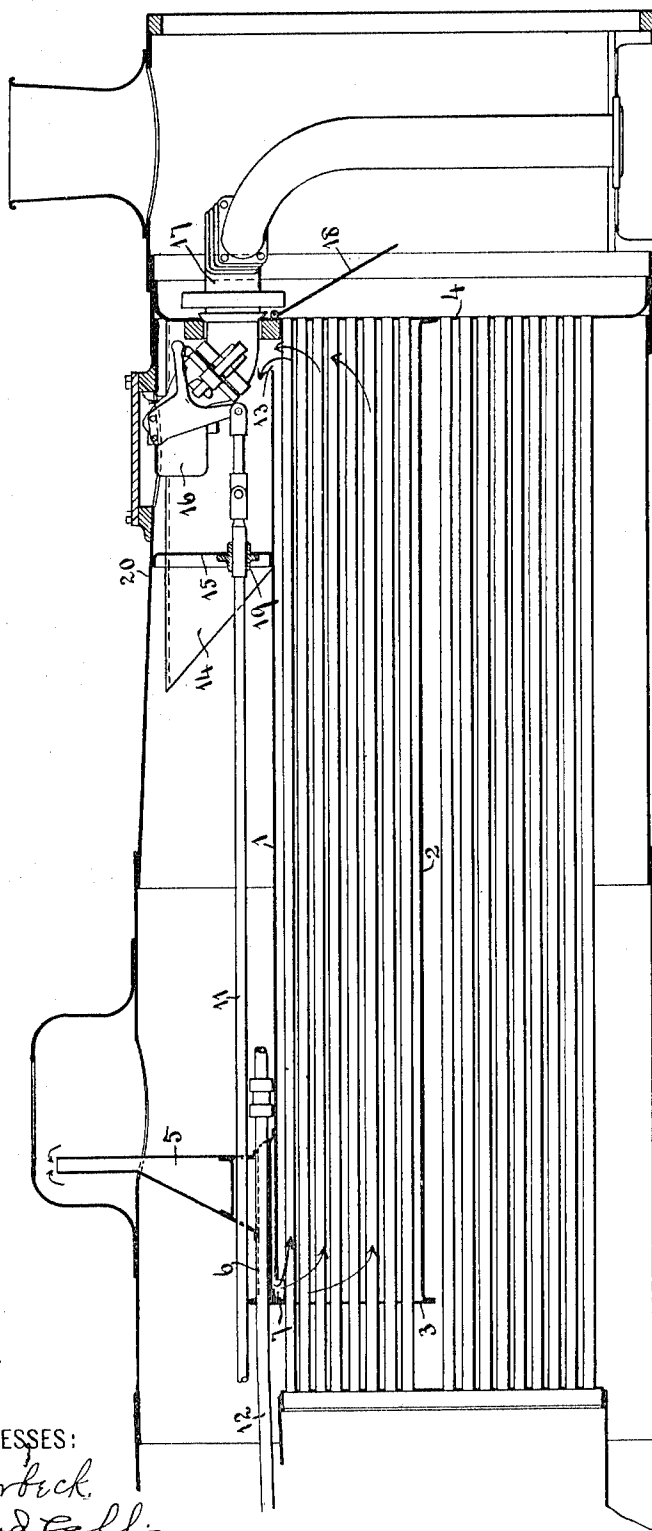


Fig. 1.

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E. F. Hall.

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Fig. 2.

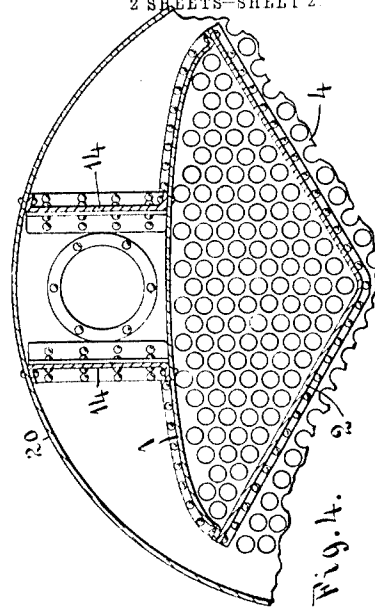


Fig. 4.

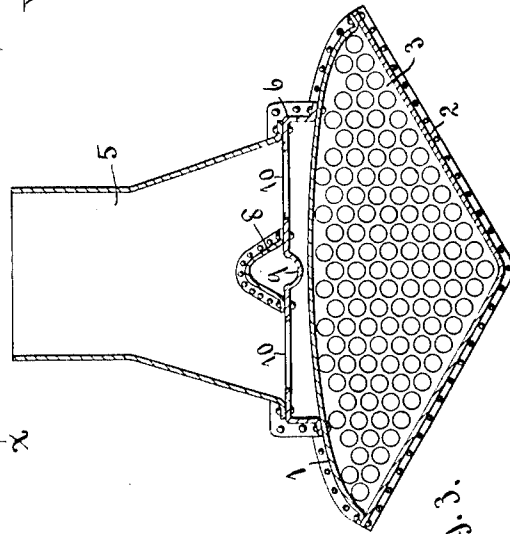


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM F. KIESEL, JR., OF ALTOONA, PENNSYLVANIA.

SUPERHEATER FOR STEAM-GENERATORS.

1.061,180.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed January 9, 1911. Serial No. 601,566.

To all whom it may concern:

Be it known that I, WILLIAM F. KIESEL, Jr., a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Superheaters for Steam-Generators, of which the following is a specification.

This invention relates to improvements in superheaters adapted to be applied more particularly to locomotive boilers; and the object of my improvements is to provide a simple arrangement of the superheater parts which will create practically no increase in the weight of the boiler, or any necessary attention at round houses for maintenance or repair.

I attain my object by constructing the superheater and applying it to the boiler in the manner illustrated in the accompanying drawings, in which—

Figure 1 shows a longitudinal vertical section through a locomotive boiler, forward of the firebox, with my superheater applied thereto; Fig. 2, a plan view of the superheater, detached from the boiler; Fig. 3, a transverse section on the line $x-x$ in Fig. 2, looking to the left; and Fig. 4, a similar section on the line $y-y$ in Fig. 2, looking to the right, and showing also a portion of the front flue sheet and boiler shell.

Like numerals designate like parts in the several views.

The superheater consists of a shell, composed of a crown piece 1, slightly convexed, and a bottom piece 2, of V-shape, the edges of which are riveted to the edges of the crown piece. The shell so formed is of a size sufficient to inclose about one-fourth of the tubes, and extends from the front flue sheet of the boiler to within about one foot of the fire box flue sheet, where the flues pass through the end wall 3 of the shell, the flues at this point being expanded so as to produce practically a water-tight fit. At the forward end the shell is riveted to the front flue sheet 4, of the boiler. Saturated steam passes from the steam space of the boiler into the superheater through a vertical conduit 5, which rests upon a raised piece 6, riveted to the top piece 1 at the rear end of the shell, and forming a chamber into which an aperture 7, cut through the end of the top piece, opens. A passageway through the conduit is formed by an arch piece 8, and a longitudinal depression 9 in

the piece 6; through which passageway the throttle rod 11 and the injector pipe 12 pass. On each side of the arch 8 apertures 10 are formed through which the steam passes from the conduit 5 into the chamber formed by the piece 6. By this arrangement the conduit 5 is so positioned as to extend upward into the present standard dome of the boiler, so that the steam is taken into the superheater from the boiler at a point where it will have least moisture. It will be understood, of course, that this conduit may be so positioned as to take the steam from a point within the shell of the boiler, if it be desired to dispense with the dome; and that the conduit may be made of any desirable shape or dimensions. For the boiler herein shown, the opening into the top of the conduit is three inches by twenty-one inches.

At the front of the boiler a steam space is formed by means of two longitudinal stay sheets 14 and a cross sheet 15, riveted to the barrel 20 of the boiler, to the front flue sheet, and to the top piece 1 of the superheater. A passageway through the top piece 1 at 13 adjacent the front flue sheet leads into this chamber. Within the chamber is located the throttle valve 16 from which the connection 17 leads to the cylinder branch pipes. This chamber takes the place of the dome in ordinary saturated steam boilers. A damper 18 is hinged above the tubes in the smoke box, and is so shaped as to cover the ends of the tubes which pass through the superheater when in closed position; any suitable means being provided for opening and closing this damper, which is not new in the art. The throttle rod 11 passes through the cross sheet 15, by way of a steam packed sleeve 19 riveted to the sheet; and all seams and joints of the superheater shell, and its connections with the boiler shell, are riveted and calked so as to be practically watertight.

The operation when using this superheater will be as follows: When the boiler is first fired up the damper 18 will be closed over the superheater tubes, and will remain closed until the locomotive is ready to be attached to a train, to prevent the overheating of the tubes in the superheater. The damper will then be opened and remain open until the locomotive is detached from a train, or is put into the round house. When the locomotive is in service, steam will

be generated as usual, the saturated steam passing by way of the conduit 5 into the superheater, and thence forward along the tubes, which are heated by the passage there-
5 through of the gases of combustion from the firebox, until the forward end of the boiler is reached, when the thoroughly dried and superheated stem will rise through the pas-
sageway 13 into the throttle valve cham-
10 ber, whence it will be delivered to the cyl-inders by the opening of the throttle valve.

Among the advantages of my invention it may be stated that the triangular cross sec-
15 tion of the shell of the superheater renders it adaptable to boilers of the type now in common use without materially changing their construction. The widely separated
entrance openings 10 distribute the wet steam
20 over the comparatively flat V-shaped bot- tom of the superheater and as it travels for- ward over the bottom plate it forms a steam
film which acts as an insulator to prevent
transference of heat from the tubes of the
25 superheater to the water in the boiler. It will be noted that the side walls 14 of the
throttle chamber serve to brace and strengthen the front flue sheet and also sup-
port the crown sheet of the superheater from
the shell of the boiler.

30 The throttle valve, branch pipe, smoke box, stack, etc., are similar in arrangement to the same parts in the boilers of saturated steam locomotives, and the operation of the locomotive by the engineer is in no wise
35 different, with the exception of the adjust- ment of the damper for covering the tubes which pass through the superheater.

What I claim as my invention and desire to secure by Letters Patent is—

1. In a boiler of the locomotive type, the
40 combination with the boiler shell and fire tubes, of a superheater chamber through which a plurality of the upper fire tubes pass, the upper wall of said superheater
chamber being arched and its lower wall
45 being V-shaped in cross section and having an inlet opening at its rear end and a de-
livery opening near its forward end, a rear
flue sheet for the superheater adjacent the
fire box, a common flue sheet for the for-
50 ward end of the superheater and boiler, and spaced longitudinally extending bracing
plates secured to the top of the superheater,
the boiler shell and the forward flue sheet.

2. In a boiler of the locomotive type, a
55 superheater chamber inclosing portions of the upper fire tubes of the boiler, a duct for transferring steam from the boiler to the
rear end of the superheater, and a throttle
chamber above the forward end of the
60 superheater, the said throttle chamber hav-
ing side walls connected respectively to the shell of the boiler, the front flue sheet of the
boiler and the top sheet of the superheater
and serving to brace the flue sheet and sup-
65 port the superheater casing, substantially
as and for the purpose set forth.

In testimony whereof I have affixed my
signature, in presence of two witnesses.

WILLIAM F. KIESEL, JR.

Witnesses:

J. FOSTER MECK,
J. C. STORM.