This invention relates to deheaters for the blow off of boilers and particularly to a mechanism of this character which is adapted to be connected to sewer pipes, the object being to cool the steam or hot water coming from the boiler before it enters the sewer pipes thereby preventing danger and damage to the sewers which often occurs when live steam or hot water is discharged directly into said sewer pipes.

This object is attained by the mechanism illustrated in the accompanying drawings.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Of the drawings:

Figure 1 represents a vertical longitudinal section of a device for the blow off of boilers, embodying the principles of the present invention.

Figure 2 represents an elevation of the same shown in connection with a cooling tank and a sewer or waste pipe.

Figure 3 represents an elevation of one of the inlet nozzles.

Figure 4 represents a longitudinal section of a longer inlet nozzle.

Figure 5 represents an elevation of the valve tripping cam member.

Figure 6 represents a horizontal section on line 6,6 on Fig. 1, and Figure 7 represents a section on line 7,7 on Fig. 1.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings, 10 is a tank provided with a cold water inlet 11 and a vapor outlet 12.

From a point near the bottom of this tank 10 extends a line of pipe 13 provided with an upwardly extending portion 14, a horizontal portion 15 and a downwardly inclined portion 16, these portions 14, 15 and 16 forming a trap between the tank 10 and a sewer pipe 17.

The lower end of the pipe portion 10 communicates with a branch 18 of the sewer pipe 17, the end 19 of which may be connected to any soil or waste pipe in a well known manner.

In the pipe 17 is a trap 20 of any well known construction. From a point near the top of the tank 10 extends a pipe 21 which is connected to one end of a housing 22 having two upwardly extending branches 23, 24.

The opposite end of the housing 22 is connected to the blow off pipe 25 of a steam boiler.

The housing 22 is provided near its inlet end with a reduced threaded bore to receive a nozzle 26 having a cone shaped bore and a hexagonal end 26a to which a wrench may be applied when installing the nozzle or removing it from the housing 22.

The housing 22 is provided with a hand hole 26 and cover 27 therefor.

By removing the cover 27 access is given to the interior of the housing 22 in order that the nozzle 26 may be removed and another substituted therefor, it being understood that nozzles 26 of different lengths are provided to accommodate the mechanism for varying conditions of operation.

Secured to the top of the branch 24 is a closing plate 28, having in the center thereof an opening 29 to which is threaded an annular valve seat 30 preferably formed of brass.

Superimposed upon the seat 30 and normally closing the opening 30 is a valve member 31 having a downwardly extending stem 32.

The plate 28 is provided with a downwardly extending arm 33 bifurcated at its lower end and having pivoted thereto at 34 a cam member 35 normally contacting with the stem 32.

The cam member has below its pivot a disk extension 36 centered in the bore of housing 22 in the path of any steam or water flowing through said housing.

The flow of liquid in the housing 22 impacting against the disk 36 will cause the cam member 35, to move into the position indicated in dotted lines thereby moving the stem 32 into its dotted position, tilting the valve 31 on its seat and thus uncovering the opening 30.

The movement of the stem 32 from the vertical position is limited by the stop member 37 forming a part of the arm 33.

Extending upwardly from the plate 28 is an annular projection 38 having threaded thereto a cap 39 provided with downwardly extending flanges 40 contacting with the periphery of the valve member 31.

A pipe 41 extends upwardly from the cap 39 to the cover 42 of the chambered member 43 secured to the top of the branch 23 of housing 22.

The chamber 44 of the member 43 has a partition 45 therein having an opening 46 there-
through aligned with the branch 23 of housing 22.

The upper end of the member 43 is cylin-
drical and disposed in this cylindrical upper end
of a reciprocable valve member 47, the lower end
of which is of less diameter than the upper part
thereof and is adapted to close the opening
40 under normal conditions.

A water pipe 49 from a suitable source of sup-
ply communicates with the chamber 44 at a
point above the partition 45. This pipe 49 is
provided with a strainer 48 or of usual construc-
tion.

The upper end of the valve member 47 does
not fit the cylindrical end of member 43 so
closely that water will seep between its
periphery and the cylindrical wall of member
43 and pass through the pipe 41 to close the valve
35 under certain conditions to be hereinafter
described.

In the center of the valve 47 is a cylindrical
member 50 adapted to contact with the lower
end of screw 51 to limit the upward movement
of said valve 47.

The screw 51 is threaded to cap 42 and ad-
justable endwise therein, being held in adjusted
position by the clamp nut 52.

Under ordinary conditions the various ele-
ments of the mechanism are in the position
shown in the drawings and the pres-
sure on the opposite sides of the valve 47 is bal-
nanced so that said valve remains on its seat.

When the boiler is blown off, the impact against
the disk 36 of the steam and water in housing
22 will actuate the cam 35, causing the open-
ing of the valve 47 permitting the water
in the pipe 41 to pass into the housing 32.

When the water passes from the pipe 41 there
will be no pressure above the valve 47 and the
flow of water from the pipe 49 will lift the valve
47 from its seat permitting the water in pipe 49
to pass through the opening 46 into the housing
22 and as this water is cool it will mix with the
steam and hot water from the boiler and reduce
the temperature thereof so that whatever water
passes into the tank 10 will be comparatively
cool.

The water discharged from this tank 10 into
the sewer pipe 17 will be in such condition that
no damage can be done to the pipe and no steam
will be admitted to said pipe 17 to escape through
manholes and cause inconvenience to pedes-
trians in the vicinity of said manholes.

At the completion of the blowing off of the
boiler the cam member 35 will return to its
normal position closing the valve 31.

As soon as this valve 31 is closed, the water
seeping past the valve member 47 will build up
pressure in the pipe 41 and in the upper part
of member 43 sufficient to close the valve 47,
thus preventing any further admission of water
to the housing 22 until it is necessary to blow
off the boiler again.

The action of the mechanism is entirely auto-
matic, requiring no attention of any workman
except such periodical inspection as may be
necessary to determine if the mechanism is al-
ways in working order.

The member 50 is supported near its upper
end by guide fingers 53 forming part of the
valve member 47, the lower end of said member
50 being threaded to a disk 54 between which
and the body of the member 47 is an annular
member 55 of composition, this annular mem-
ber 55 coacting with the valve seat 56 when said
valve is closed.

Owing to the bore of the nozzle 25 being cone-
shaped, any liquid passing through the same
will be discharged therefrom in the form of a jet
adapted to impact against the disk 36. It will
be noted that the pressure on the upper part of
the valve 47 extends over a much greater sur-
face than the pressure of the water from pipe
49 against the under surface of said valve and
due to this fact the pressure in the pipe 41 will
retain the valve 47 closed as long as the valve
31 remains closed.

This means of deheating the discharge from a
boiler during the blow off is simple to construct,
readily cared for, and very effective in operation.

It is believed that the operation and many
advantages of the invention will be understood
readily without further description.

Having thus described my invention, I claim:

1. In a deheater for the blow off of boilers, the
combination of a housing; an inlet nozzle extend-

ing into one end thereof; a water inlet to said
housing; a reciprocable valve for said inlet;
means for creating a pressure above said valve
by the inlet water to retain the valve in closed
position; and mechanism including a pivoted
member in the path of and actuated by the dis-
charge of liquid from said nozzle for reduc-
ing said pressure and permitting the opening of
said valve.

2. In a deheater for the blow off of boilers,
the combination of a housing; an inlet nozzle
extending into one end thereof; a water inlet to
said housing; a reciprocable valve for said inlet;
means for creating a pressure above said valve
by the inlet water to retain the valve in closed
position; and mechanism including a pivoted
member provided with a disk within
said housing and in front of said nozzle to re-
duce said pressure and permit the opening of
said valve when said member is actuated by the
liquid discharged from said nozzle.

3. In a deheater for the blow off of boilers,
the combination of a housing; an inlet nozzle
extending into one end thereof adapted to dischage
liquid through said housing; a water inlet to said
housing; a reciprocable valve for said valve;
means for creating a pressure above said valve
by the inlet water to retain the valve in closed
position; and mechanism including a movable
member within said housing adapted to be actuated
by the discharge from said nozzle for reducing the pressure on said
valve and thereby controlling the operation of
said valve.

4. In a deheater for the blow off of boilers,
the combination of a housing provided with two
upwardly extending branches; an inlet nozzle in
one end of said housing; a chambered
member secured to one of said branches and provided
with a water inlet to said branch; a valve for
closing said inlet and adapted to be opened by
the inflow of water against a lower surface
thereof; a pipe leading from the top of said
chambered member to the other branch; clos-
ing means in the other branch for preventing
the flow of liquid through said pipe; and means ex-
tending into the housing in front of said nozzle
adapted to be actuated by the discharge from
said nozzle for lifting said closing means and
permitting the liquid in said pipe to enter said
housing.

5. In a deheater for the blow off of boilers,
the combination of a housing provided with two
upwardly extending branches; an inlet nozzle in
one end of said housing; a chambered member
secured to one of said branches and provided with a
water inlet to said branch; a valve for closing said
inlet and adapted to be opened by the inflow of water against a lower surface thereof; a pipe leading from the top of said chambered member to the other branch; a closing means in the other branch for preventing flow of liquid through said pipe; and means extending into the housing in front of said nozzle adapted to be actuated by the discharge from said nozzle for lifting said closing means and permitting the liquid in said pipe to enter said housing; said closing means having a depending stem, normally means contacting with a pivoted cam member movable about its pivot by the discharge from said nozzle.

6. In a deheader for the blow off of boilers, the combination of a housing provided with two upwardly extending branches; an inlet nozzle in one end of said housing; a chambered member secured to one of said branches and provided with a water inlet to said branch; a valve for closing said inlet and adapted to be opened by the inflow of water against a lower surface thereof; a pipe leading from the top of said chambered member to the other branch; a closing means in the other branch for preventing flow of liquid through said pipe; and means for lifting said closing means and permitting the liquid in said pipe to enter said housing, said means including a depending stem to said closing means normally contacting with a pivoted cam member movable about its pivot by the discharge from said nozzle against a disk extension to said cam member.

7. In a deheader for the blow off of boilers, the combination of a housing provided with two upwardly extending branches; an inlet nozzle in one end of said housing; a chambered member secured to one branch and having a cylindrical upper end and a partition having an opening therein communicating with said branch; a reciprocating valve reciprocable in said upper end and having a slight space between its periphery and the wall of said member, the lower end of said valve having less exposed surface than the upper end thereof; a water inlet to said chambered member above said partition; a pipe extending from the upper end of said member to the other branch; means for building up a pressure in said pipe; and mechanism in the other branch actuated by the flow of liquid through said housing for releasing said pressure, said releasing mechanism comprising a disk valve having a depending stem adapted to be tilted and a cam member coating with said stem and having a disk extension depending into said housing.

8. In a deheader for the blow off of boilers, the combination of a housing provided with two upwardly extending branches; an inlet nozzle in one end of said housing; a chambered member secured to one branch and having a cylindrical upper end and a partition having an opening therein communicating with said branch; a reciprocating valve reciprocable in said upper end and having a slight space between its periphery and the wall of said member, the lower end of said valve having less exposed surface than the upper end thereof; a water inlet to said chambered member above said partition; a pipe extending from the upper end of said member to the other branch; means for building up a pressure in said pipe; and mechanism in the other branch actuated by the flow of liquid through said housing for releasing said pressure, said releasing mechanism comprising a disk valve having a depending stem adapted to be tilted and a cam member coating with said stem and having a disk extension depending into said housing.

9. In a deheader for the blow off of boilers, the combination of a housing provided with two upwardly extending branches; an inlet nozzle in one end of said housing; a chambered member secured to one branch and having a cylindrical upper end and a partition having an opening therein communicating with said branch; a reciprocating valve reciprocable in said upper end and having a slight space between its periphery and the wall of said member, the lower end of said valve having less exposed surface than the upper end thereof; a water inlet to said chambered member above said partition; a pipe extending from the upper end of said member to the other branch; means for building up a pressure in said pipe; and mechanism in the other branch actuated by the flow of liquid through said housing for releasing said pressure, said releasing mechanism comprising a disk valve having a depending stem adapted to be tilted and a cam member coating with said stem and having a disk extension depending into said housing.

10. In a deheader for the blow off of boilers, the combination of a housing provided with two upwardly extending branches; an inlet nozzle in one end of said housing; a chambered member secured to one branch and having a cylindrical upper end and a partition having an opening therein communicating with said branch; a reciprocating valve reciprocable in said upper end and having a slight space between its periphery and the wall of said member, the lower end of said valve having less exposed surface than the upper end thereof; a water inlet to said chambered member above said partition; a pipe extending from the upper end of said member to the other branch; means for building up a pressure in said pipe; and mechanism in the other branch actuated by the flow of liquid through said housing for releasing said pressure, said releasing mechanism comprising a disk valve having a depending stem adapted to be tilted and a cam member coating with said stem and having a disk extension depending into said housing.

11. In a deheader for the blow off of boilers, the combination of a housing; an inlet nozzle therein; a water inlet therein, a reciprocable valve therefor normally closed by the pressure of the inlet water; and automatic mechanism including a pivoted member within said housing actuated by the discharge from said nozzle for releasing the pressure on said valve thereby permitting the opening of said water inlet valve and adapted to close the same when said discharge ceases.

12. In a deheader for the blow off of boilers, the combination of a housing; an inlet nozzle therein; a water inlet therein, a reciprocable valve therefor normally closed by the pressure of the inlet water; and automatic mechanism including a pivoted member within said housing actuated by the discharge from said nozzle for releasing the pressure on said valve and permitting the opening of said water inlet and adapted to close said valve when said discharge ceases, said mechanism including in part a valve tripping pivoted member disposed within said housing and having a disk portion in front of said nozzle.

13. In a deheader for the blow off of boilers, the combination of a housing; an inlet nozzle therein; a water inlet therein, a reciprocable valve therefor normally closed by the pressure of the inlet water; and automatic mechanism including a pivoted member within said housing and adapted to be moved by the impact of the jet thereof.

14. In a deheader for the blow off of boilers, the combination of a housing; an inlet nozzle extending into one end thereof having a cone-shaped bore; a water inlet to said housing; a reciprocable valve for said inlet; mechanism for creating a pressure by the inlet water above said valve to retain the valve in closed position; and mechanism including a movable mem-
ber within said housing and adapted to be actuated by the discharge of liquid from said nozzle for reducing said pressure and permitting the opening of said valve by the inlet water.

15. In a deheader for the blow off of boilers, the combination of a housing; means for ejecting a jet of liquid into one end thereof; a water inlet to said housing; a reciprocable valve for said inlet; means for creating a pressure above said valve by the inlet water to retain the valve in closed position; and mechanism including a pivoted cam member within said housing and provided with a disk in the path of said jet adapted to be actuated by the discharge from said nozzle to reduce said pressure and permit the opening of said valve by the inlet water.

16. In a deheader for the blow off of boilers, the combination of a housing; means for ejecting a jet of liquid into one end of said housing; a water inlet to said housing; a reciprocable valve therefor; and mechanism including a movable member within the housing and adapted to be actuated by the impact of said jet for controlling the operation of said valve by building up a pressure on said valve by the inlet water and subsequently releasing said pressure.

EDWARD P. BROCK.