

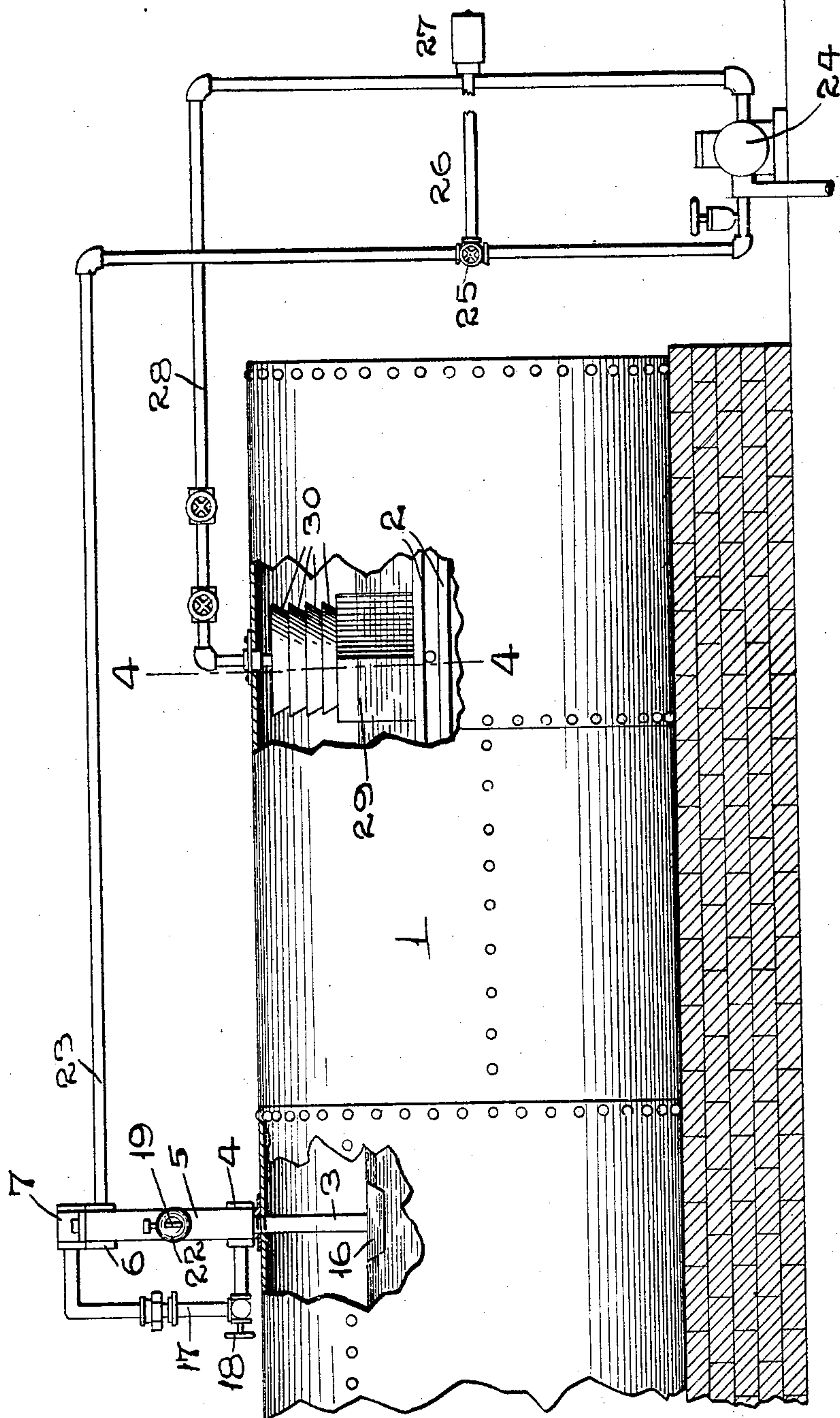
D. M. MAXON.
 AUTOMATIC WATER REGULATOR AND SURFACE BLOW-OFF.
 APPLICATION FILED MAY 8, 1906.

969,294.

Patented Sept. 6, 1910.

2 SHEETS—SHEET 1.

FIG. 1.



ATTEST.

A. J. Fletcher.
M. P. Smith.

INVENTOR

DANIEL M. MAXON.

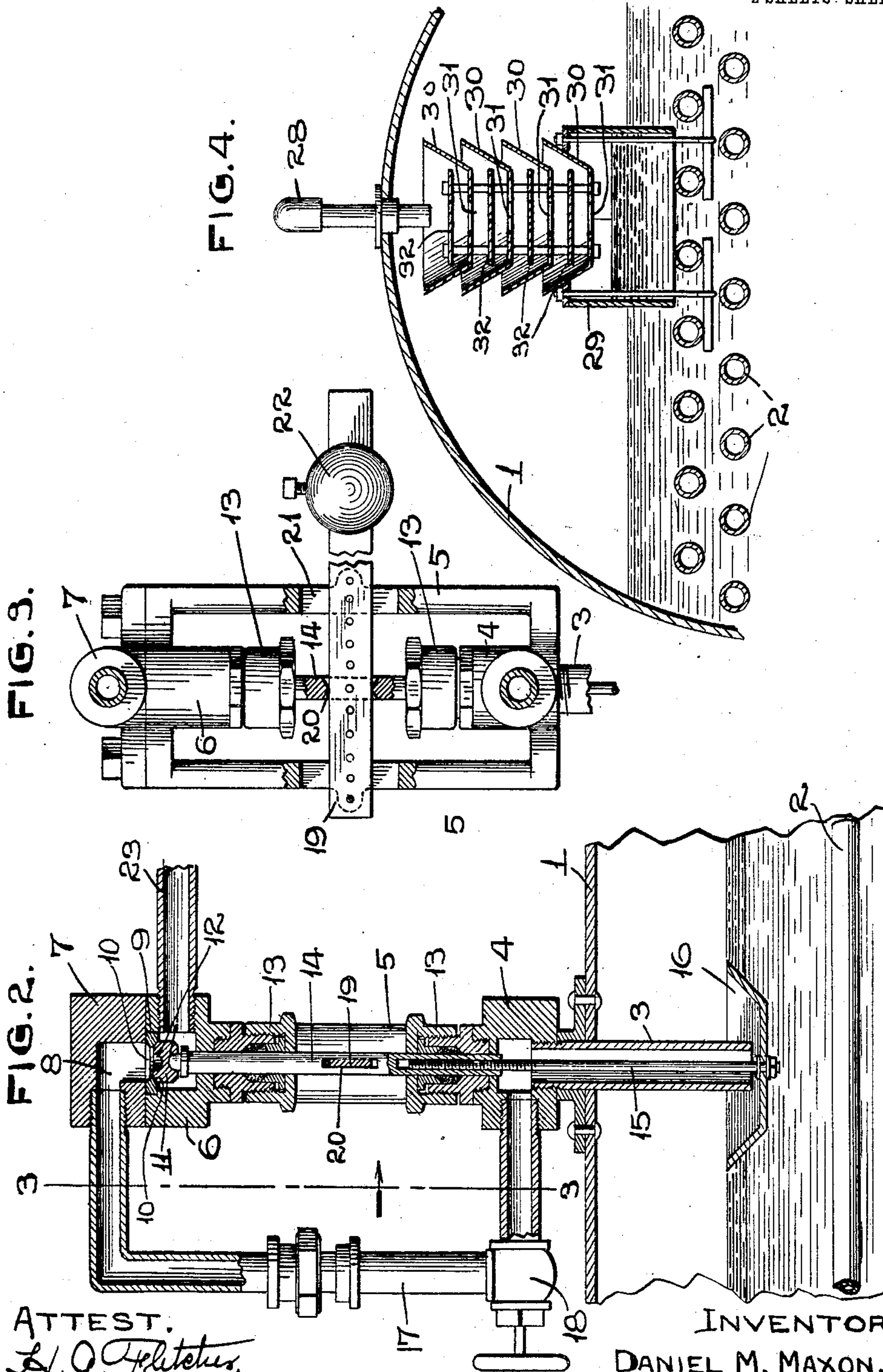
BY *Nigdon & Longan.*
 ATT'Y'S.

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2 SHEETS—SHEET 2.



ATTEST.
L. G. Fletcher.
W. P. Smith.

INVENTOR.
 DANIEL M. MAXON.
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UNITED STATES PATENT OFFICE.

DANIEL M. MAXON, OF ST. LOUIS, MISSOURI.

AUTOMATIC WATER REGULATOR AND SURFACE BLOW-OFF.

969,294.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application filed May 8, 1906. Serial No. 315,824.

To all whom it may concern:

Be it known that I, DANIEL M. MAXON, a citizen of the United States, and resident of St. Louis, Missouri, have invented certain new and useful Improvements in Automatic Water Regulators and Surface Blow-Offs, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an automatic water regulator, and surface blow off, and the object of my invention is to construct a simple apparatus which automatically regulates the water which is pumped into a steam boiler, and which purifies said water by removing the sediment which accumulates on the surface of the water when the same has become heated.

My invention further consists in certain novel features of construction and arrangement of parts, which will be hereinafter more fully set forth, pointed out in my claim, and illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of a portion of a boiler equipped with my improved apparatus with parts of said boiler broken away to more clearly illustrate portions of the apparatus; Fig. 2 is a vertical section taken through the blow off portion of the apparatus; Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2; Fig. 4 is an enlarged detail section taken on the line 4—4 of Fig. 1.

Referring by numerals to the accompanying drawings: 1 designates a horizontal boiler of the usual type, and provided with the ordinary boiler tubes 2. Fixed in the top of the boiler is a vertically arranged tube 3, the upper end of which is screw seated in a hollow block 4. Formed integral with and projecting upwardly from the sides of this block 4 is a pair of vertically disposed bars 5, and formed integral with the upper ends of said bars is a hollow block 6, arranged immediately over the hollow block 4. Removably positioned on top of the hollow block 6 is a cap 7 through which is formed a passageway 8. Removably positioned in the upper end of the block 6 is a ring 9, and on the opposite sides thereof around the openings therethrough are formed the beveled valve seats 10. This ar-

range ment provides for the reversal of the ring 9 when one of the valve seats becomes worn from use.

11 designates a valve in the form of a disk with its top and bottom edges beveled to correspond with the beveled seats 10, and said disk is normally positioned against the under side of the ring 9, and closes the opening therethrough. Formed in the top and bottom surfaces of this valve 11 are recesses 12.

Arranged on top of the block 4 and on the under side of the block 6 are stuffing boxes 13, and arranged for vertical movement therethrough is a rod 14, the upper end of which fits in the recess 12 in the under side of the valve 11. The lower end of this rod 14 terminates on the interior of the hollow block 4, and screw seated in the lower end of said rod is the upper end of a small rod 15. Fixed to the lower end of the rod 15 immediately below the lower end of the tube 3 is a float 16, in the form of an open topped pan, which is intended to normally rest on top of the water in the boiler. Leading from the hollow block 4 outwardly and upwardly into the cap 7 is a tube 17 in which is located a suitable valve 18. A weight lever 19 is fulcrumed to one of the bars 5, and extends from thence through the slot 20, formed through the rod 14, and said lever also extends through the slot 21 formed in the opposite bar 5; and adjustably located on the free end of said lever is a weight 22. The fulcrum point of this weight lever can be adjusted as desired, and the weight 22 can be adjusted on the lever so as to regulate the depth of the pan 16 in the water within the boiler. Leading outwardly from the hollow cap 6 from a point below the ring 9 is a pipe 23 which leads to the pump 24, which supplies the water to the boiler; and located in this pipe, in front of the pump is a two-way valve 25, from which leads outwardly a pipe 26, on the end of which is located a suitable whistle 27. Leading from the pump 24 upwardly and into the boiler, through the top thereof, is a pipe 28, which is the pipe which delivers the supply of water from the pump to the boiler.

Located immediately beneath the discharge end of this supply pipe 28, and resting upon and fixed to the top row of boiler

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tubes 2 is a rectangular box 29, the upper
and lower ends of which are open. The
lower end of this box is normally below the
water line of the boiler, and the upper end
5 thereof is above the water line of the boiler.
Supported on top of this box 29 is a series
of open topped pans 30, the same being ar-
ranged at equal distances apart, and with
the top pan immediately beneath the dis-
10 charge end of the pipe 28.

Formed through the center of the bottom
of each pan is an aperture 31, and horizon-
tally disposed in each pan, immediately
above said aperture, and held in any suit-
15 able manner, is a disk 32, there being a
slight space between the periphery of each
disk and the side wall of the pan in which
it is located.

The operation of my improved apparatus
20 is as follows: The pump 24 being operated
forces water through the pipe 28, and said
water discharges from the end of said pipe
28 onto the upper one of the disk 32. The
water flows over said disk and discharges
25 from the edge thereof into the upper one of
the pans 30, and discharges through the
aperture 31 in the bottom thereof into the
next lowermost disk 32; and this flow is con-
tinued throughout the series of alternately
30 arranged pans and disks until the water
finally discharges from the lowermost pan
into the box 29. The incoming water thus
traverses a tortuous passage through the
pans, and, in so doing, spreads over a con-
35 siderable area in an approximate thin sheet,
and thus becomes heated before discharging
into the body of water already within the
boiler.

The steam within the boiler maintains the
40 pans and plates at a very high temperature.
The open topped pan 16 normally floats on
top of the water within the boiler, and if for
any reason the water supply should decrease
or be shut off so as to cause the amount of
45 water in the boiler to drop below normal,
the pan will move downwardly with the de-
crease of water in the boiler, and, as a result,
the rods 15 and 14 are pulled downwardly,
thus unseating the valve 11 from the under
50 side of the ring 9. Steam now passes up-
wardly through the tube 3 into the hollow
head 4, and thence through the hollow pipe
17 into the cap 7; from thence past the open
valve 11, through the pipe 23, and from
55 thence out through the pipe 23, and from
thence out through the pipe 26, and through
the whistle 27, which is necessarily sounded
by the escaping steam. The valve 25 is nor-
mally set so as to allow the steam to pass
60 from the pipe 23 to the pipe 26. Should, for
any reason, the supply of water to the boiler
increase so as to rise above normal, said wa-
ter will finally overflow the upper edge of
the pan 16, and, as soon as a sufficient
65 amount of water has entered said pan, the

same will sink beneath the surface of the
water, thus drawing the rods 15 and 14
downwardly and unseating the valve 12. As
soon as the pan is entirely submerged, water
is forced outwardly through the pipe 3 and
70 various other connections, as just specified,
and the air in advance of this water is forced
outward through the pipes 23 and 26, and as
said air passes through the whistle 27, an
alarm is given; and the operator by now 75
turning the valve 25, directs the discharge of
water to the pump 24, by which pump it is
delivered back to the boiler through the pipe
28. The speed of the pump is now regulated
so as to supply the proper amount of water 80
to the boiler, and as the water level in the
boiler is brought back to normal, the pan 16
will again float on top of said water and
close the valve 11.

It is a well known fact that in steam boil- 85
ers a large portion of the sediment, or im-
purities, in the water rise to the top thereof
when the water boils in the generation of
steam, and my improved apparatus can be
utilized as a surface blow off by purposely 90
increasing the supply of water to a boiler
until the pan 16 sinks, and thus the surface
water within the boiler containing the sedi-
ment and impurities will automatically be
blown off and removed from the boiler, 95
through the pipe 26. When this blowing off
operation takes place, the water within the
pan 16 is forced out through the pipe 3,
owing to the fact that the lower end of said
pipe extends almost to the bottom of said 100
pan 16. Therefore, when the water is again
brought to its normal elevation, the pan will
float on the top of the water.

In order to purify the water discharging
into the boiler, a quantity of oil is located in 10
the box 29, and a small quantity of oil is
allowed to discharge with the water through
the pipe 28, and the oil in the box 29 gradu-
ally absorbs the sediment and impurities of
the water discharging into the boiler, and in 1
a short time the amount of oil in the box
becomes of such volume and of such weight
as that a portion of the oil, carrying the
impurities, is forced out of the bottom of
the box, which amount will of course corre- 1
spond with the amount of oil being deliv-
ered to the box with the water. The oil
discharging from the lower end of the box,
with the impurities held in suspension being
of less specific gravity than the water, will
rise to the surface thereof to be removed
when the apparatus acts as a surface blow-
off.

The proper quantity of oil to be located in
the box 29 can be supplied through the inlet
pipe 28 whenever desired.

The weight 22 can be regulated on the le-
ver 29 so as to correspondingly regulate the
action of the rods 14 and 15, and the pan 16.
The ring 19 and valve 11 are made reversi-

ble in order that they may be inverted should either one or both become worn from use.

5 An apparatus of my improved construction is simple, inexpensive, easily installed on boilers already in use, purifies the water delivered to a boiler, and automatically removes the surface water from a boiler which contains a large percentage of impurities.

10 I claim:—

15 The improved automatic water-level indicator and surface blow-off for steam-boilers, comprising a float in the form of an open pan adapted to rest upon the water in a steam boiler and rise and fall therein with the fluctuations of water-level; a blow-off valve mounted exterior of the boiler; a rod extending from said valve to said pan, so that said valve and said pan will move in unison as the water-level rises or falls; two stuffing-boxes through which the rod oper-

ates; a weighted-lever applied to said rod at a point intermediate of said two stuffing-boxes; an adjustable-weight on said lever; a blow-off pipe through which water from a point near the bottom of the interior of said pan passes out of said boiler whenever the water-level rises sufficiently to overflow said pan, and through which pipe steam passes when the water-level abnormally falls; a pipe into which the discharged water and steam pass from said blow-off pipe to one side of said valve; and another pipe into which said steam and water are discharged after passing by said blow-off valve.

35 In testimony whereof, I have signed my name to this specification, in presence of two subscribing witnesses.

DANIEL M. MAXON.

Witnesses:

M. P. SMITH,
EDWARD E. LONGAN.