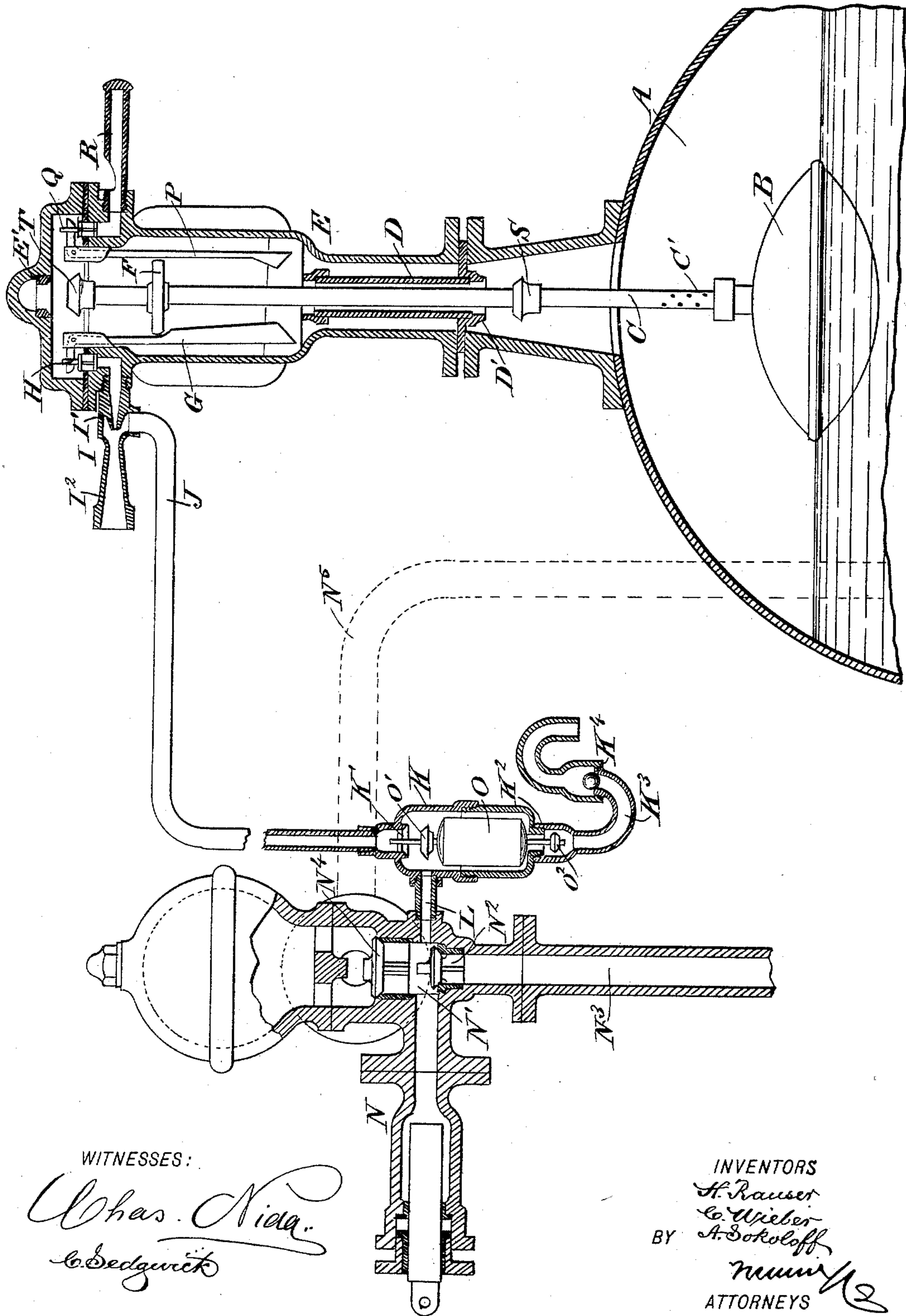


(No Model.)

H. RAUSER, C. WIEBER & A. SOKOLOFF.
BOILER FEEDER

No. 468,209.

Patented Feb. 2, 1892.



WITNESSES:

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HEINRICH RAUSER, CHARLES WIEBER, AND ALEXIS SOKOLOFF, OF MOSCOW,
RUSSIA.

BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 468,209, dated February 2, 1892.

Application filed April 1, 1891. Serial No. 387,282. (No model.)

To all whom it may concern:

Be it known that we, HEINRICH RAUSER and CHARLES WIEBER, subjects of the Emperor of Germany, and ALEXIS SOKOLOFF, a subject of the Czar of Russia, all of Moscow, Russia, have invented a new and Improved Boiler-Feeder, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved boiler-feeder which is simple and durable in construction and very effective and automatic in operation.

The invention consists of an ejector controlled by a float in the boiler and adapted to control the feed-pump.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure is a sectional side elevation of the improvement as applied.

In the boiler A is arranged a float B, provided with an upwardly-extending hollow stem C, passing through a pipe D, held in a casing E, secured on the shell of the boiler, as plainly illustrated in the drawing. Near the upper end of the stem C is arranged a disk F, adapted to engage with its periphery one arm of a bell-crank lever G, fulcrumed in the casing E and carrying on its other arm a valve H, leading to an ejector I, of any approved construction, provided with the usual nozzle I' and the cone-shaped mouth I². Into the ejector I leads a pipe J below the nozzle I', the said pipe J being connected with a casing K, from which leads a pipe L to the valve-chamber N' of the feed-pump N. In the valve-chamber N' is held a suction-valve N². Over the suction-pipe N³ and directly above the suction-valve N² is arranged a discharge-valve N⁴, connected with a discharge-pipe N⁵, leading to the interior of the boiler A. The pump N is continually in operation; but as soon as the valve H is closed and the ejector I is not working the suction-valve N² remains seated, as the valve-chamber N' is connected with the outer air by the pipe L, the casing K, and the pipe J, connected with the mouth

I² of the ejector. In the casing K is arranged a float O, provided on its upper end with a valve O', adapted to be seated on a valve-seat K', formed in the upper end of the casing K at the entrance of the pipe J to the said casing. On the lower end of the float O is also secured a valve O², adapted to be seated on a seat K², formed in the lower end of the casing K and connected with an S-shaped outlet-pipe K³, containing a ball-valve K⁴. When the water in the boiler A sinks below the normal level, the float B slides downward with the falling of the level of the water, thereby moving the disk F on its stem C into contact with an incline on the bell-crank lever G, so that the latter is actuated and the valve H is raised off its seat. Steam from the boiler can now pass through the pipe D, the upper part of the casing E, past the valve H, into the ejector I, so that air is drawn through the pipe J into the ejector and a vacuum is consequently formed in the valve-chamber N' of the feed-pump. As the latter is continually in operation, water will rise in the suction-pipe N³, pass into the pump past the valve N², part of the water passing into the casing K, in which the float O is caused to rise by the incoming water until finally the valve O' seats itself on the seat K', thereby closing the pipe J, the valve O² seating itself on the seat K², so as to close the outlet or discharge pipe K³. The pump N now operates in the usual manner, forcing the water past the outlet-valve N⁴ into the outlet-pipe N⁵, so that the water is pumped into the boiler A. When the water has risen in the boiler A to the normal level, the float B has risen upward with the water and the disk F is again brought back to its former normal position above the incline on the bell-crank lever G. The valve H is thus again seated on its seat and the ejector I stops working. As soon as the ejector stops working the pressure in the pipe J on the valve O' causes the float O to move downward, the said valve O' having a larger area than the valve O². As soon as the valves O' and O² are unseated the water in the casing K flows through the outlet-pipe K³, whereby the air entering the pipe J again passes to the valve-chamber N', so that the valve N² remains seated on the

further working of the pump and no water is forced into the boiler A. It is understood that as soon as water in the boiler reaches the normal level the valve H closes and further
 5 escape of steam through the ejector cannot take place. The atmospheric air now enters the pipe J through the mouth I² of the ejector I and passes to the valve O'. The further working of the pump does not raise the water
 10 in the suction-pipe N³, as on the return stroke of the piston air and water are drawn into the cylinder, the former through the mouth I² and pipe J and the latter from the casing K, as the vacuum above the valve O' ceases
 15 as soon as the steam is shut off from ejector by the seating of valve H, as above mentioned. The float O consequently sinks and the pump only sucks in air through ejector I, pipe J, casing K, and pipe L until the ejector is again
 20 actuated and produces a vacuum above the valve O'.

In case the valve H or other parts described are out of order and the pump should not force the necessary amount of water into the
 25 boiler, as above described, then the water in the boiler will sink to a dangerous level. In order to warn the operator of the danger, the following device is provided: A second bell-crank lever P is pivoted in the upper end of
 30 the casing E and is provided on its vertical arm with an incline arranged a suitable distance below the incline of the bell-crank lever G, arranged opposite the lever P. The horizontal arm of the bell-crank lever P carries
 35 a valve Q, connected with a whistle R, so that when the water sinks to a dangerous level in the boiler the float B moves downward, and the disk F, acting on the bell-crank lever P, causes the valve Q to be unseated and steam
 40 is free to pass from the boiler to the whistle R to sound the same, thus giving the signal.

To prevent too much water from being pumped into the boiler A by the feed-pump N, the following device is provided: On the
 45 stem C is arranged a valve S, adapted to be seated on a valve-seat D', formed on the lower end of the pipe D, establishing communication between the interior of the boiler A and casing E, as previously described. Now when
 50 the water rises to its maximum level in the boiler A the valve S seats itself on the seat D' of the pipe D, so that steam cannot pass to the casing E and to the ejector I, so that the operation of the pump N ceases, as previously explained.
 55

In order to permit the float B to fall with the receding water in the boiler A, a valve T is provided formed on the extreme upper end of the hollow stem C and adapted to be seated
 60 on a valve-seat E', arranged in the cap of the casing E. When the valve S is seated on its seat, the valve T is likewise seated on its seat E'. Now as soon as the water recedes in the boiler A the steam passing through the apertures C' in the hollow stem C to the valve T presses on the latter, so that the pressure on the valve S is equalized and the float B is free

to sink with the falling water. It will thus be seen that the boiler-feeder is completely automatic in operation, prevents a dangerous
 70 filling of the boiler, and also gives a signal in case the water should sink to a dangerous level.

Having thus described our invention, we claim as new and desire to secure by Letters
 75 Patent—

1. A boiler-feeder comprising an ejector connected with the boiler, a float held in the boiler and controlling the said ejector, and a feed-pump having its valve-chamber in com-
 80 munication with the said ejector, substantially as shown and described.

2. In a boiler-feeder, the combination, with a boiler and a feed-pump for the same, of an ejector connected with the said boiler and in
 85 communication with the valve-chamber of the said pump, substantially as shown and described.

3. In a boiler-feeder, the combination, with a boiler and a feed-pump for the same, of an
 90 ejector connected with the said boiler and in communication with the valve-chamber of the said pump, and a float arranged in the said boiler and controlling a valve connecting the said ejector with the boiler, substantially as
 95 shown and described.

4. In a boiler-feeder, the combination, with an ejector and a valve for connecting the ejector with the boiler, of a continually-work-
 100 ing feed-pump having its valve-chamber in communication with the said ejector, and a float for controlling the said ejector-valve, substantially as shown and described.

5. In a boiler-feeder, the combination, with an ejector, substantially as described, adapted
 105 to be connected with a boiler, of a pipe leading to the said ejector, a casing connected with the said pipe, and a feed-pump having its valve-chamber connected with the said casing, substantially as shown and described.
 110

6. In a boiler-feeder, the combination, with an ejector adapted to be connected with the boiler, of a pipe leading to the said ejector, a casing connected with the said pipe, a feed-
 115 pump having its valve-chamber connected with the said casing, and a float held in the said casing and provided with two valves, of which one is adapted to close the said pipe and the other the outlet of the said casing, substantially as shown and described.
 120

7. In a boiler-feeder, the combination, with a float provided with a stem and held in the boiler, of a disk secured on the float-stem, a bell-crank lever adapted to be actuated by
 125 the said disk, a valve carried by the said bell-crank lever, and an ejector, substantially as described, connected with the said valve and provided with a pipe in communication with the valve-chamber of the feed-pump, substantially as shown and described.
 130

8. In a boiler-feeder, the combination, with a float provided with a stem and held in the boiler, of a disk secured on the said float-
 stem, a bell-crank lever adapted to be actu-

ated by the said disk, a valve carried by the
said bell-crank lever, an ejector connected
with the said valve, and a feed-pump having
its valve-chamber connected with the said
5 ejector, substantially as shown and described.

9. In a boiler-feeder, the combination, with
a casing connected with the interior of the
boiler, of a float held in the boiler and pro-
vided with a stem passing into the said cas-
10 ing, a bell-crank lever pivoted in the said
casing and adapted to be actuated by a disk

on the said float-stem, a valve held on the
said bell-crank lever, and an ejector connect-
ed with the said valve and adapted to control
the feed-pump, substantially as shown and 15
described.

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Witnesses:

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