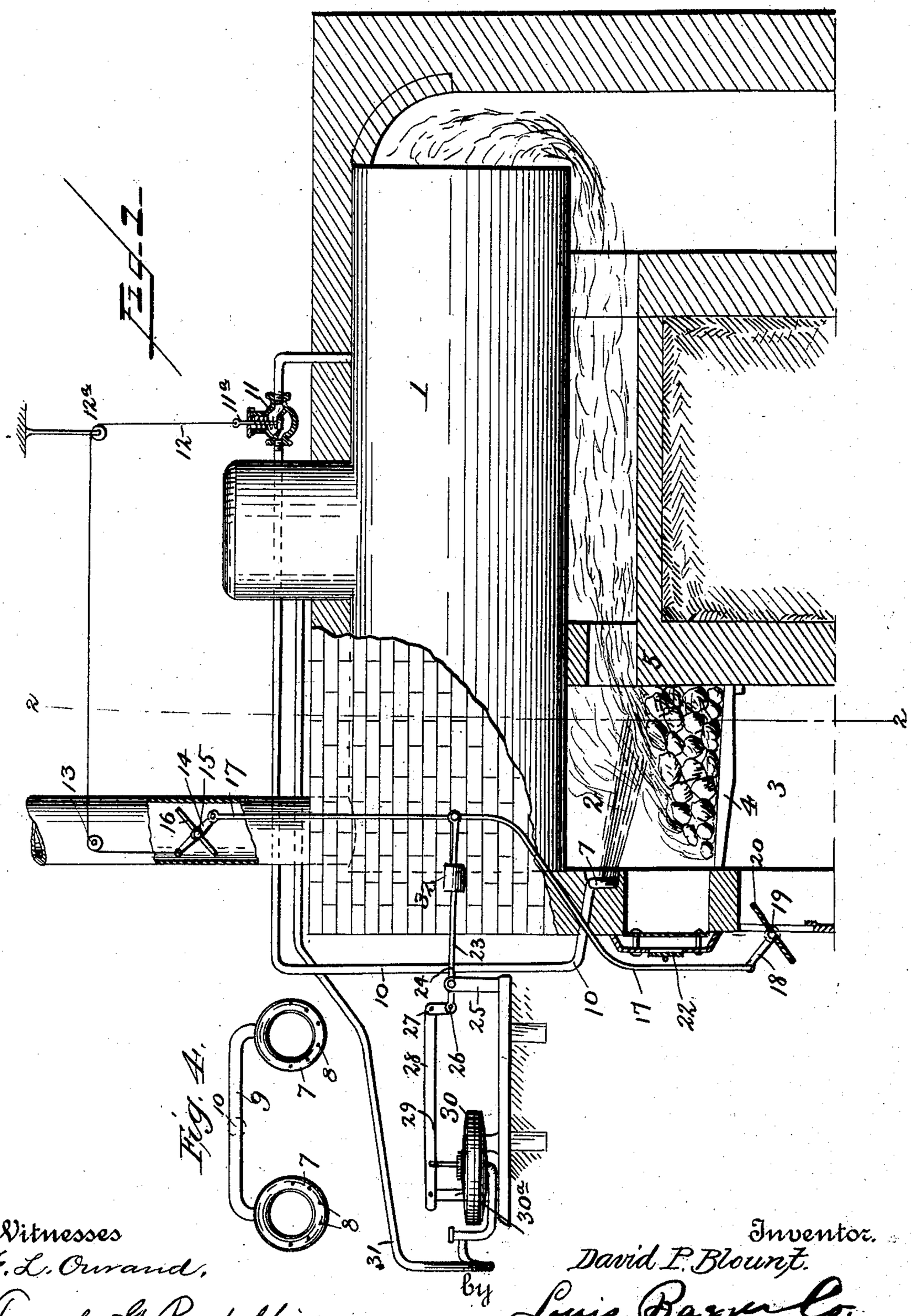
No. 693,221. Patented Feb. 11, 1902.

D. P. BLOUNT.

AUTOMATIC STEAM PRESSURE REGULATOR.

(Application filed July 19, 1901.)

(No Model.) 2 Sheets—Sheet 1.



Witnesses
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Fig. 2.

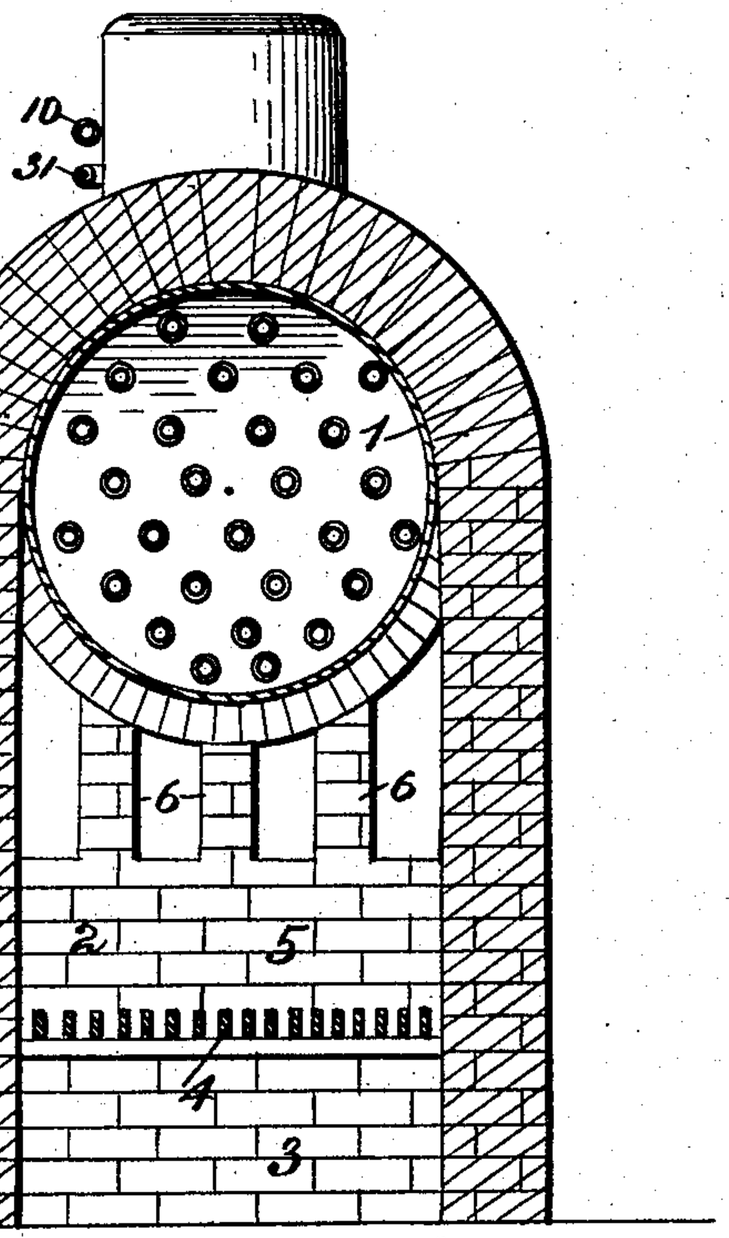
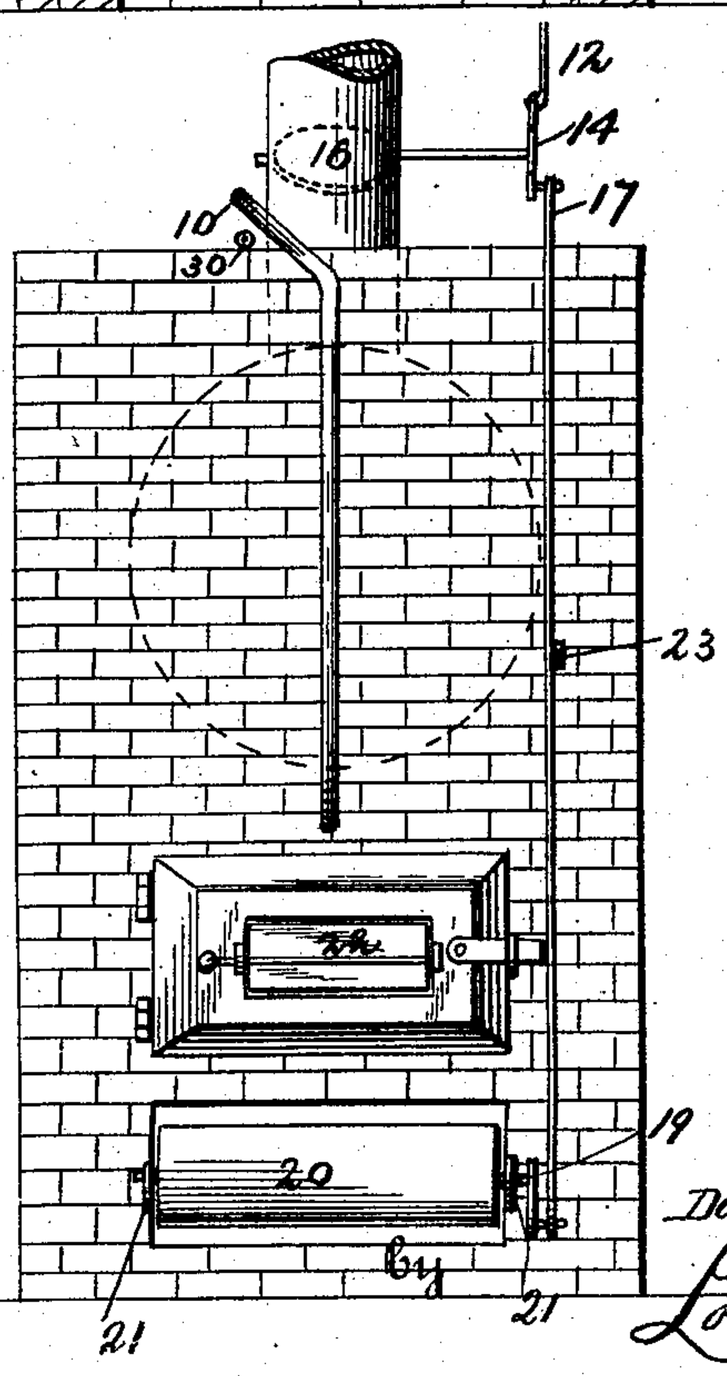


Fig. 3.



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UNITED STATES PATENT OFFICE.

DAVID P. BLOUNT, OF NORFOLK, VIRGINIA.

AUTOMATIC STEAM-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 693,221, dated February 11, 1902.

Application filed July 19, 1901. Serial No. 68,957. (No model.)

To all whom it may concern:

Be it known that I, DAVID P. BLOUNT, a citizen of the United States, residing at Norfolk, in the county of Norfolk and State of Virginia, have invented new and useful Improvements in Automatic Steam-Pressure Regulators, of which the following is a specification.

My invention relates to an automatic steam-pressure regulator or governor; and the object of the same is to construct a device which will keep the steam-pressure almost constant without waste of fuel and steam.

With this end in view I have connected a pressure-regulator to simultaneously operate a furnace-spray, a smoke-stack damper, and an ash-pit damper, thereby regulating the draft and shutting off the spray when not required. This is accomplished by the simple and novel construction described in this specification and claimed, and illustrated in the accompanying drawings, forming a part thereof, in which—

Figure 1 is a side elevation, partially in section, of a steam-boiler and furnace with my device attached thereto. Fig. 2 is a transverse section on the line 2 2, Fig. 1. Fig. 3 is a front elevation of the furnace with the pressure-regulator and connecting mechanism removed. Fig. 4 is a detail of the sprays.

Like numerals of reference designate like parts in the different views of the drawings.

The numeral 1 designates a stationary steam-boiler walled in, as is usual, and having a furnace 2 and an ash-pit 3, separated by grate-bars 4. A bridge-wall 5 at the back of the furnace 2 supports several partitions 6, which split up the flame.

A pair of sprays 7 are located in the front wall of the furnace 2. These sprays consist of hollow circular rings having perforations 8 in their front faces. A pipe 9 connects the sprays 7 and is itself connected to a steam-pipe 10, which passes back and is joined to the top of the boiler 1. A spring-actuated valve 11 is located in the pipe 10 and has a vertical stem 11^a. The stem 11^a is connected to a flexible wire 12 or cord, which passes up over a pulley 12^a, then across and over a pulley 13, mounted on the smoke-stack, and then down, and is connected to one end of crank-bar 14, keyed on a horizontal shaft 15, carrying a damper 16, mounted in the smoke-stack. The other end of the bar 14 is pivoted to a connecting-rod 17, which extends downwardly and is pivoted at its lower end to a crank-arm 18, keyed on a shaft 19, carrying a damper 20. The shaft 19 rests in brackets 21 and is detachable. The damper 20 regulates the admission of air into the ash-pit, and therefore the furnace 1. A damper 22 is also mounted in the furnace-door, but forms no part of the present device.

To operate the dampers 20 16 and the sprays 7 by means of the variation in the steam-pressure, it is only necessary to attach the long arm 23 of a lever 24 to the connecting-rod 17. The lever 24 is fulcrumed in a standard 25 and has its short arm 26 connected by a link 27 to the long arm 28 of a second lever 29, which is also connected to a pressure-regulator 30 of any of the known and approved forms. The regulator 30 is mounted in a cylinder 30^a, which is connected to a steam-pipe 31, joined to the boiler 1. The long arm 23 of the lever 24 is weighted by a sliding block 32. This weight insures the immediate operation of the device when the pressure drops suddenly.

From the connections above described it will be evident that a rise in pressure of the steam will operate the regulator 30 to raise the lever 29, which motion will be increased by the lever 24 and transmitted to the connecting-rod 17, which will be pulled down, thereby operating and closing the dampers 20 and 16. The wire 12 will be slackened, permitting the valve 11 to seat and cut off the steam to the sprays. When the steam-pressure goes down in response to the diminished draft, the damper and valve will be operated in the reverse direction through the medium of the levers and the pressure-regulator 30.

By using an apparatus operating but one damper some of the advantages of my device could be obtained; but I have found that in order to obtain prompt and efficient regulation and to save fuel it is necessary to operate both dampers, one in the smoke-stack and another in the ash-pit, as shown. This can be accounted for by the fact that if but the ash-pit damper 20 were closed and the smoke-stack left open the little air coming in through cracks would keep the coal burning and the

flame therefrom would pass up and through the boiler. This heat is sufficient to prevent the rapid reduction of steam-pressure desired. If but the smoke-stack damper 16 was closed by the regulator, the air coming in through the ash-pit damper would keep the coal burning, keep up steam, and cause disagreeable smoking of the furnace. To be sure, the spray would help to keep down the fire, but it is found to be undesirable to spray the fire very heavily, as it becomes very sluggish and fails to respond to the opening of the dampers.

I do not wish to be limited as to details of construction, as these may be modified in many particulars without departing from the spirit of my invention.

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

The combination with a boiler and furnace, of a spray mounted in said furnace and connected to the boiler by a pipe provided with a spring constructed to normally hold said valve closed, a damper mounted in the smoke-stack on a shaft provided with a crank-arm, a flexible member connecting said crank-arm and said valve, a damper mounted in the front of the ash-pit on a shaft bearing a crank-arm, a connecting-rod connecting said crank-arms, a lever having its long arm connected to said connecting-rod, a pressure-regulator connected to said boiler, and means for connecting said pressure-regulator to said lever, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

DAVID P. BLOUNT.

Witnesses:

GUY E. PADGETT,

FRANK G. RADELFINGER.