

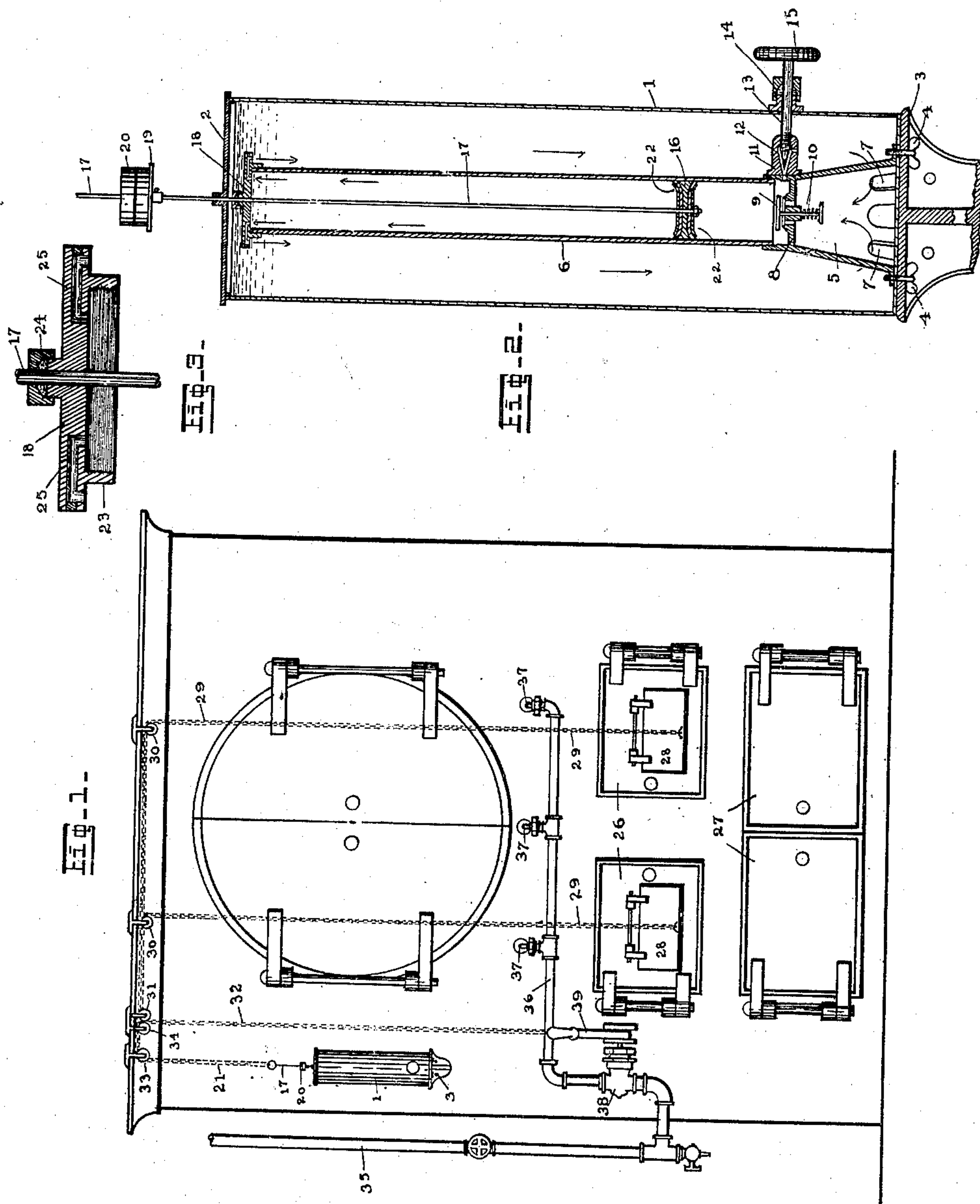
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PATENTED APR. 12, 1904.

E. HONESS.
REGULATOR.

APPLICATION FILED AUG. 1, 1902.

NO MODEL.



WITNESSES
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EDWIN HONESS, OF CLEVELAND, OHIO.

REGULATOR.

SPECIFICATION forming part of Letters Patent No. 757,113, dated April 12, 1904.

Application filed August 1, 1902. Serial No. 117,912. (No model.)

To all whom it may concern:

Be it known that I, EDWIN HONESS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Regulators, of which the following is a specification.

This invention relates to regulators or controllers that are used in connection with boiler-furnaces to determine automatically the length of time that a blast is to be permitted to blow into the furnace after fresh fuel has been added thereto.

The object of my invention is to cheapen the manufacture and simplify the construction of these devices and to render them more satisfactory in operation and more sensitive in adjustment. This object I attain in the structure illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a boiler-casing, showing the way in which my improved regulator is applied and used. Fig. 2 is a central longitudinal section through the center of the regulator, and Fig. 3 is an enlarged sectional view through the cap for the cylinder.

It is well known that the addition of a fresh quantity of fuel to the ordinary boiler-furnace results in the production of great quantities of smoke, and it is also known that if the furnace is properly constructed this smoke can be greatly reduced and, in fact, practically eliminated by a proper supply and admixture of air in the furnace at the time when the more volatile gases and more easily detached particles of carbon are driven off. In order to introduce the requisite amount of air, it is necessary to resort to a forced draft, which is obtained by blowing a blast of air or a blast of steam which induces a blast of air into the furnace; but this blast must be carefully regulated, else it will continue after all necessity for it has ceased, with the result that the furnace is cooled and the boiler injured by undue and unnecessary expansion and contraction of its tubes. My invention is intended to regulate this blast by shutting it off automatically, and, as shown in the drawings, in which similar reference characters designate corresponding parts throughout the different

views, it consists of an outer casing 1, that is almost filled with water, and a flanged cover 2.

The device is supported upon a bracket 3, that is secured to the front of the boiler, and is held in place by bolts or screws 4, that pass through the bracket and casing.

Arranged centrally within the casing and supported upon a base-piece 5 is an open-ended cylinder 6, said cylinder being threaded at its lower end, so that it may be screwed into the upper end of the base-piece 5. This base-piece is provided with lugs at its lower part, into which screw the bolts or screws 4, said bolts thus holding the base-piece in proper position within the casing and also holding the casing on the bracket. The base-piece is provided in its lower part with openings 7 for the free passage of water. Near its upper end there is a transverse partition or diaphragm 8, said partition having a central opening. This opening is normally closed by a valve 9, said valve being held down by a spring 10.

Suitably mounted upon the upper part of the base-piece is a box 11, that contains a conically-shaped chamber 12 for the end of the valve-stem 13. This chamber communicates at its inner end with the interior of the base between the partition 8 and the lower end of the cylinder 6 and at its lower part with the interior of the casing 1. The inner end of the valve-stem is conical in shape to fit the chamber 12 and is threaded just above the conical portion, so that it may be screwed into the box 11 to close or open the valve. This stem projects outwardly through the casing 1 and is surrounded by a packing-gland 14 to prevent leakage of the water. On its outer end it is provided with a hand wheel or disk 15, so that it may be turned.

Longitudinally movable within the cylinder 6 is a piston 16, to the center of which is secured the piston-rod 17. This rod extends upwardly through the cap 18, that closes the upper end of the cylinder, and through the cover 2, outside of which it is provided with a disk 19, upon which rests a series of weights 20. At its upper end the piston-rod is attached to the end of a chain 21, the purpose of which will be hereinafter stated.

The piston 16 is provided on each of its

sides with packing-disks 22, which may be of leather or any other suitable material. These disks prevent the escape of the water past the piston when it is moving in either direction.

5 The cap 18 is provided with an annular flange 23, that screws down outside the upper end of the cylinder 6. A packing-gland 24, which surrounds the piston-rod, prevents the escape of the water from the upper end of
10 the cylinder except as it flows through the ducts 25, which are formed in the cap. These ducts are so turned at their outer ends that as the water is forced out of the upper end of the cylinder it is discharged downwardly into
15 the main body of water in the casing 1. In this manner the water is prevented from squirting out of the regulator when the piston is moved quickly upward, and as the ducts are comparatively small they serve to
20 prevent the too sudden operation of the parts which lift the piston. While the ducts may be formed in any suitable manner, I prefer to drill the horizontal ducts and then connect the inner end with the interior of the cylinder.
25 The portion outside the cylinder is likewise connected by drilling upwardly to the said horizontal parts, when the extreme end of the latter part can be plugged.

Fig. 1 shows the front end of a boiler to
30 which my invention is applied, in which 26 represents the fuel-doors and 27 the ash-pit doors. The fuel-doors each carry damper-doors 28, that are pivoted to swing up and down to regulate the quantity of air that is admitted through
35 the fuel-doors. Connected with the damper-doors are the lower ends of chains 29, that pass up and over sheaves 30 and are then carried across and over another sheave, 31, when they are joined to a vertical chain 32. The
40 chain 21 is also passed over sheaves 33 and 34 and is joined to the chain 32.

35 is a pipe leading from the boiler or some other suitable supply of steam or compressed air, said pipe being connected with a horizontal
45 pipe 36, that extends across the front of the boiler. Connected with the latter pipe at intervals are branch pipes 37, that lead into the boiler-furnace, where they are provided with spraying-nozzles. (Not shown.)

50 38 is a valve for controlling the supply of steam through the pipes, said valve having a lever 39 connected with its stem, so that when the lever is depressed the valve will be opened to admit the steam to the boiler. The chain
55 32 is connected with this lever.

The operation of the device is as follows: When it is desired to add fresh fuel to the furnace, the doors 26 are opened and the lever 39 depressed. This admits steam to the furnace and also lifts the damper-doors 28 and
60 the piston 16. As the piston rises the water above it escapes through the ducts 25 outside the cylinder, and an equal quantity flows through the openings 7 and valve 9 below the
65 piston. As stated, the rapidity of the up-

ward movement is determined by the size of the ducts. When the lever 39 is given its desired stroke and is released, the weight of the various parts that have been lifted, including the weights 20, causes the piston to settle down
70 again. As the valve 9 is now closed, this movement can take place only as the water is permitted to escape past the valve-stem 13, and owing to the construction of this valve it can be so adjusted that the flow of water can
75 be perfectly controlled. As the piston settles the valve 38 and the damper-doors 28 are closed, thus shutting off the supply of steam and air.

In order to prevent the admission of air into
80 the upper end of the cylinder as the piston descends, the outer casing is filled with water until the cylinder and its cap 18 are entirely covered.

While it is my expectation that this invention
85 will be employed mainly in connection with furnaces, it is evident that it is adapted for use in other relations, and I desire that the claims be construed broadly to cover the device when used in any manner and for any purpose.
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Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a regulator of the class described, an
95 outer vessel for liquid, a cylinder in said vessel, said cylinder being covered by the liquid, a piston in the cylinder, means for causing the piston to move back and forth in the cylinder, a valve on one side of the piston to admit the
100 liquid to the cylinder as the piston moves in one direction, and ducts on the other side of the piston through which the liquid escapes from the cylinder, said ducts extending at
105 an angle with the direction of motion of the piston.

2. In a regulator of the class described, an outer vessel for liquid, a cylinder in said vessel, a cap for the cylinder, a piston in the cylinder, means for causing the piston to move
110 back and forth in the cylinder, a valve below the piston to admit the liquid to the cylinder as the piston moves upwardly, and ducts formed in said cap for permitting the liquid to escape as the piston is thus moved, said ducts
115 opening downwardly at their outer ends, for the purpose specified.

3. In a regulator of the class described, an outer vessel for liquid, a cylinder in said vessel, a cap for the cylinder, a piston in the cylinder, means for causing the piston to move
120 back and forth in the cylinder, a valve below the piston to admit the liquid to the cylinder as the piston moves upwardly, ducts formed in said cap for permitting the liquid to escape as the piston is thus moved, said ducts opening under the liquid and in a downward direction at their outer ends, and a stuffing-box on the cap and surrounding the piston-rod, for the purpose specified.
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4. In a regulator, an outer vessel for liquid,
a cylinder in said vessel, a cap for the cylinder,
a piston, means for causing the piston to move
back and forth in the cylinder, means carried
5 by the piston to prevent the escape of the liquid
past the same as it moves in either direction,
ducts through the cap to permit the discharge
of the liquid above the piston as the latter
moves upwardly, said ducts opening down-
10 wardly as specified, a base-piece having an an-
nular flange into which the cylinder is secured,
a valve for admitting liquid to the cylinder
from the base-piece as the piston moves up-

wardly, a second valve secured to the flange
of the base-piece below the end of the cylin- 15
der, the stem of the valve having a conical
end to close the opening through the valve and
extending outwardly through the outer casing,
for the purpose specified.

In testimony whereof I affix my signature in 20
the presence of two witnesses.

EDWIN HONESS.

Witnesses:

S. E. FOUTS,

A. HILL.