

(No Model.)

2 Sheets—Sheet 1.

H. A. R. DIETRICH.
BOILER.

No. 492,664.

Patented Feb. 28, 1893.

Fig. 2

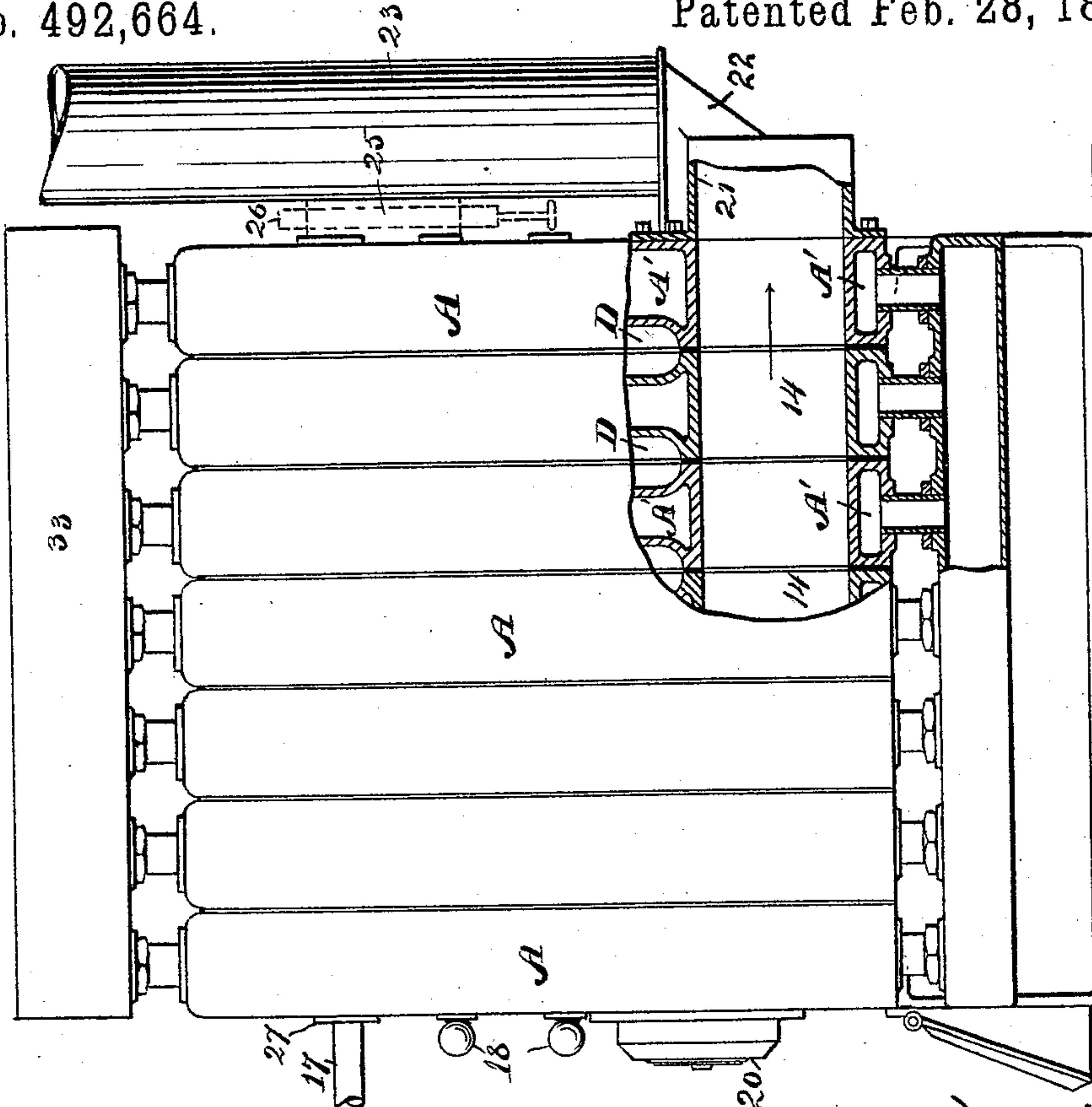
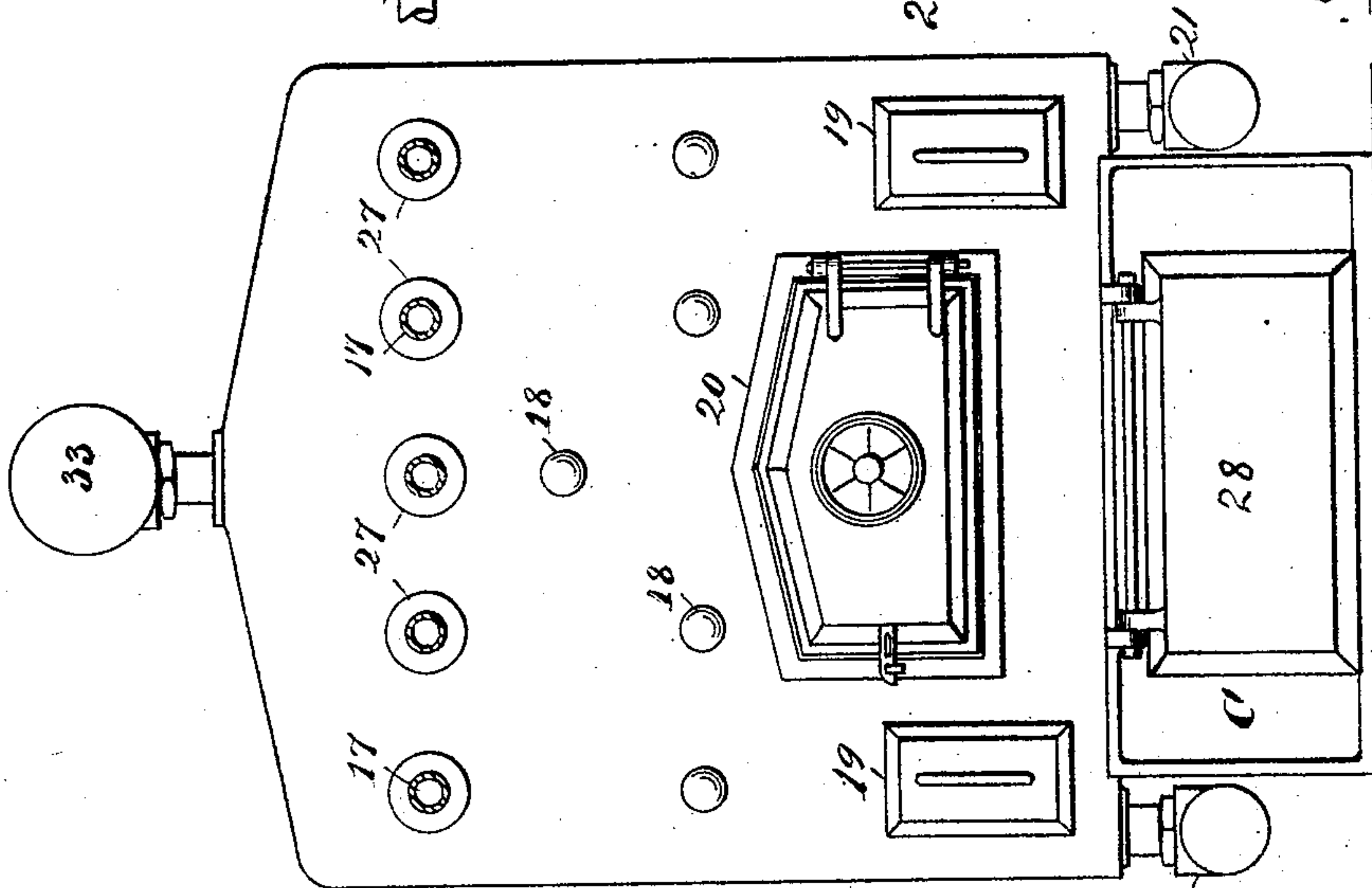


Fig. 1



WITNESSES:

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ATTORNEYS.

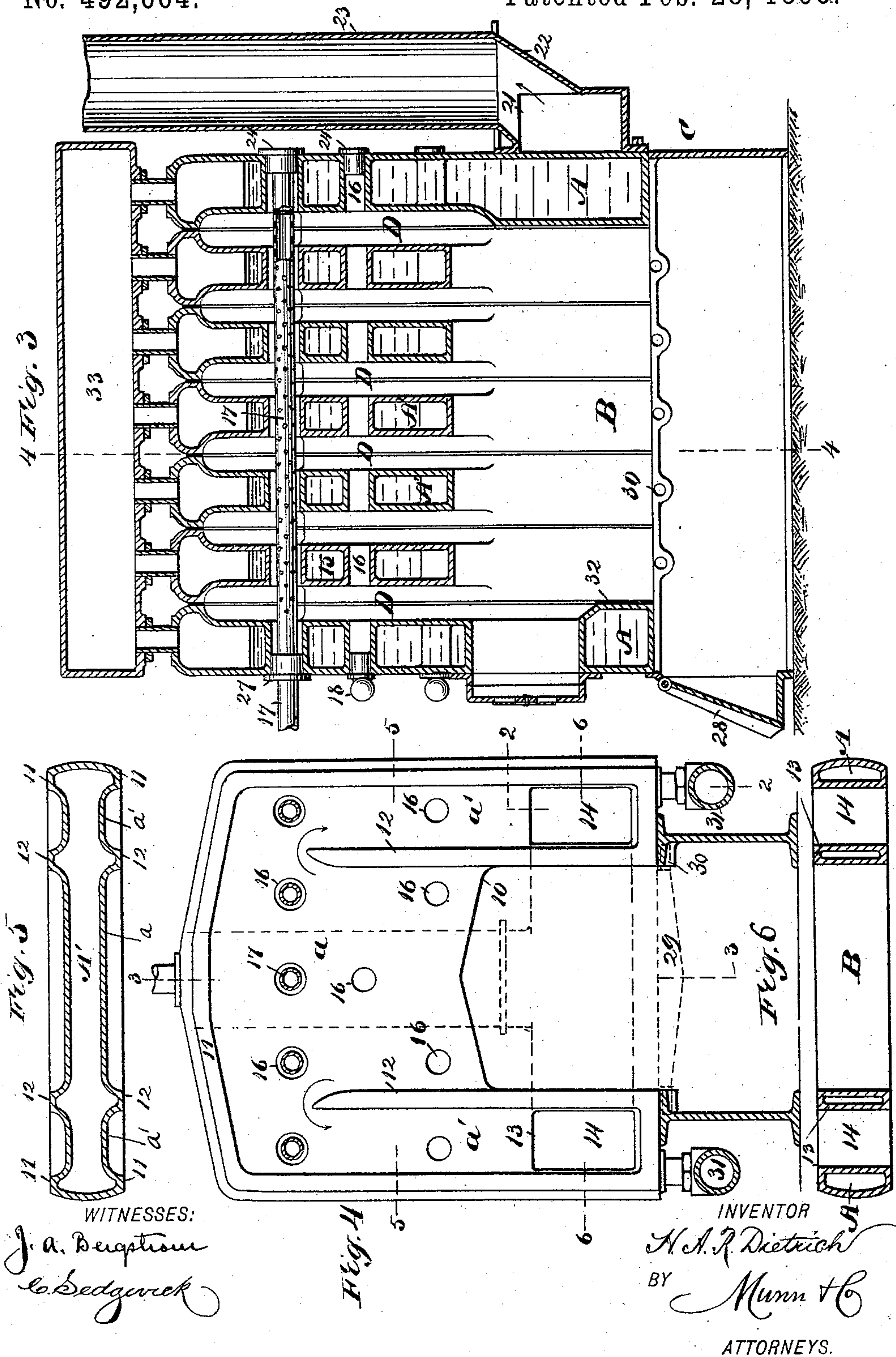
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UNITED STATES PATENT OFFICE.

HARRY A. R. DIETRICH, OF SOUTH BETHLEHEM, PENNSYLVANIA.

BOILER.

SPECIFICATION forming part of Letters Patent No. 492,664, dated February 28, 1893.

Application filed September 9, 1892. Serial No. 445,434. (No model.)

To all whom it may concern:

Be it known that I, HARRY A. R. DIETRICH, of South Bethlehem, in the county of Northampton and State of Pennsylvania, have invented a new and useful Improvement in Boilers, of which the following is a full, clear, and exact description.

My invention is an improvement upon the boiler of J. H. Mills, covered by patent dated March 31, 1891, No. 449,379.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a front elevation of the boiler. Fig. 2 is a side view thereof, a portion of it being in section and the section being indicated by the line 2—2 of Fig. 4. Fig. 3 is a central, longitudinal vertical section, taken practically on the line 3—3 of Fig. 4. Fig. 4 is a transverse vertical section taken between two of the sections of the boiler, practically on the line 4—4 of Fig. 3. Fig. 5 is a transverse sectional view, taken through one of the sections of the boiler, essentially on the line 5—5 of Fig. 4; and Fig. 6 is a similar view to Fig. 5, but taken on the line 6—6 of Fig. 4, the said view showing the position of the smoke flues in the section.

The body of the boiler is constructed of a series of sections A, and any desired number of these sections may be employed. The sections differ from one another only in the fact that one face of the front section is shaped and constructed to constitute a front of the boiler, and the inner face of the rear section is properly shaped to constitute the rear face of the boiler. The intermediate sections have both of their side faces constructed alike. These sections may be given any desired exterior contour, preferably, however, they are made to approach in shape a rectangular figure, and viewed from their side a recess or opening 10 is produced in their central portions, the side walls of the openings being some distance from the outer sides of the sections, and the opening extends through the

bottom of the section, and the top wall of the opening is preferably given an arched shape, as shown in Fig. 4.

Along the top and bottom and side edges of each face of each intermediate section a rib 11, is formed, and the rib after approaching the side walls of the openings 10 of a section, are carried vertically upward to a point preferably above the center of the section, as shown in both Figs. 4 and 5, and designated as 12. Thus a depressed central surface *a*, is located upon each side face of each intermediate section between the upwardly-extending inner ribs 12, and the depressed surface continues above these ribs, extending to the upper rib and upper portion of the upper side ribs; and side depressed surfaces *a'* are likewise produced, located between the outer side ribs and the inner ribs 12. The ribs are not solid and neither are the sections, as each section is hollow, forming an interior chamber A', and the ribs are, properly speaking, offsets from these chambers, as shown best in Fig. 5, and provide for extensions thereof.

The portions of the sections at each side of the central openings 10, may be denominated as legs, and the openings 10, are utilized to form a fire box B, when the sections are placed together. In each leg of each central section, at the lower portion of said legs, a tubular partition 13, is formed, open at each end and creating what may be denominated flues 14, and circular partitions or sleeves 15, are produced in the bodies of the sections, extending through from side to side and forming a series of openings 16. These sleeves or partitions are located in the sections in two or more sets or rows, and some of the openings 16, are ordinarily employed to receive tubes 17, closed at their inner ends but apertured throughout their length, as shown in Figs. 3 and 4, and these tubes are adapted to be used to improve combustion at these points by introducing air, the tubes being of much less diameter than the diameter of the openings in which they are located. The outer face of the front section of the boiler is not ribbed as are the faces of the inner sections, but the inner face of the front section is made to correspond to those of the intermediate or inner sections. The outer front section is provided with a like number of openings 16 as have

the intermediate sections, and these openings extend through the front section from side to side; all the openings at the outer face of the front section, except those through which the forced or natural draft pipes 17, are passed, are closed by plugs 18, as shown in Figs. 1 and 3. The smoke flues 14 in this section are also closed at the front by removable covers 19, and the fire pot opening is also closed by a suitable door 20.

The inner face of the rear section of the boiler is shaped in like manner as the side faces of the intermediate sections; but the outer face of this section is straight and not recessed, but this section is provided with all of the openings 16 that the other sections contain. The rear section, however, has not produced therein the opening 10 for the fire pot, as the inner face of this section at its lower portion is adapted to constitute the rear wall of the fire pot; therefore, the interior chamber A of the lower section extends from side to side at its lower end, as illustrated in Fig. 3; but the rear section contains the smoke flues 14, located in like manner as in the other sections; and upon the outer face of the outer section around the smoke flue, a collar 21, is formed, and these collars are connected, by pipes 22 surrounding them, with one or more offtake flues 23.

The openings 16 of the rear section are ordinarily closed by plugs 24; but when a quick draft is desired the lower openings 16, are connected directly with the offtake flue or flues, as shown at 25, in Fig. 2, and a damper 26, is employed capable of establishing communication between the exterior of the boiler and the offtake flues, or of cutting off such communication. The pipes 17 employed to create an improved combustion are fitted with bushings 27, located in either of the openings contained in the front section.

In erecting the boiler a box-like base C, is constructed which is adapted to serve as an ash box, and the base at its front end is provided with an ash door 28. In the upper portion of this base the grate bars 29, are located suitable sockets 30, being produced in the base to receive the said bars, as shown in Figs. 3 and 4. The base is not as wide as the sections of the boiler, and the sections of the boiler are mounted upon this base and bolted or otherwise secured thereto, and when so mounted the boiler sections extend beyond each side of the base, as shown in Figs. 1 and 4; and mud drums 31, are located at the side of the base, the said mud drums being connected with each of the boiler sections by suitable tubes.

The boiler sections are placed in an upright position and are made to bear one close against the other, and between the abutting sections a cement or packing 32, of a suitable nature is placed. The tubes 17, adapted to improve combustion are not carried through the openings in the rear section, but are stopped a little short of said section, and it

will be observed by reference to Figs. 2 and 3, that when the sections of the boiler are properly brought together a series of interior chambers D, are formed, and these chambers are placed in communication with each other through the medium of the opening 16 in the sections.

Upon the upper portion of the boiler when it is used as a steam boiler the steam dome 33, is placed, and this steam dome is in tubular connection with each water chamber or compartment A of each section.

The chambers D, formed in the complete boiler are adapted to receive products of combustion, as they are in direct communication with the fire box B, and at the top connect through the openings 16.

In the operation of the boiler, when used for steam purposes, the water line is, as shown in Fig. 3, above the upper set of openings 16, and it will be observed that the water chambers A of the sections all contain water, the level of the water being the same in each, and that the products of combustion, when leaving the fire-box, pass upward through the fire chambers or compartments D, impinging upon the recessed portions α of the sections, thus they pass over the vertical inner ribs 12 and enter the recessed portions α' of the sections or the side fire chambers of the completed boiler; and after passing downward in these chambers the products of combustion enter the smoke flues 14 and pass off through the offtake flue 23.

Whenever it is desired to have a forced draft, for example, air is forced into the perforated pipes 17, and the air mingles with the products of combustion in the fire chambers and in the openings 16 and tends to greatly augment the intensity of the heat.

This boiler is not only simple in its construction and durable and effective but is also adapted to be placed in a chamber and the heat from its outside shell used for warming and ventilating purposes.

This boiler is capable of being transported, each part complete in itself, and the boiler is also capable of being set up by any one of ordinary intelligence.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a boiler, the combination, with a series of sections capable of being connected and disconnected, each section complete in itself, the sections being hollowed to form water chambers and provided with depressions in their side faces, which depressions form, when arranged oppositely, vertical combustion chambers, D, that communicate directly with the fire-pot; ribs located around the margins of the sides of the sections and extending upward near their centers, said sections being further provided with a section of a fire pot located between the inner ribs, sections of smoke flues located between the inner and outer ribs, and a series of aligned

tubes extending transversely through from face to face, placing the depressed portions of the side faces in communication, one set of said tubes being adapted to receive apertured pipes through which air may be introduced or forced, substantially as set forth.

2. In a boiler, the combination, with the vertical, hollow, water-holding sections having depressions a and a' , which, when arranged oppositely, form vertical combustion chambers D, that communicate with the fire-

pot, said sections having a series of horizontal, transverse and aligned tubes, of the perforated air-inlet tube 17, inserted in said aligned tubes and made of considerably smaller diameter, and the bushings 27, applied as shown and described.

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Witnesses:

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GEO. F. KELLER.