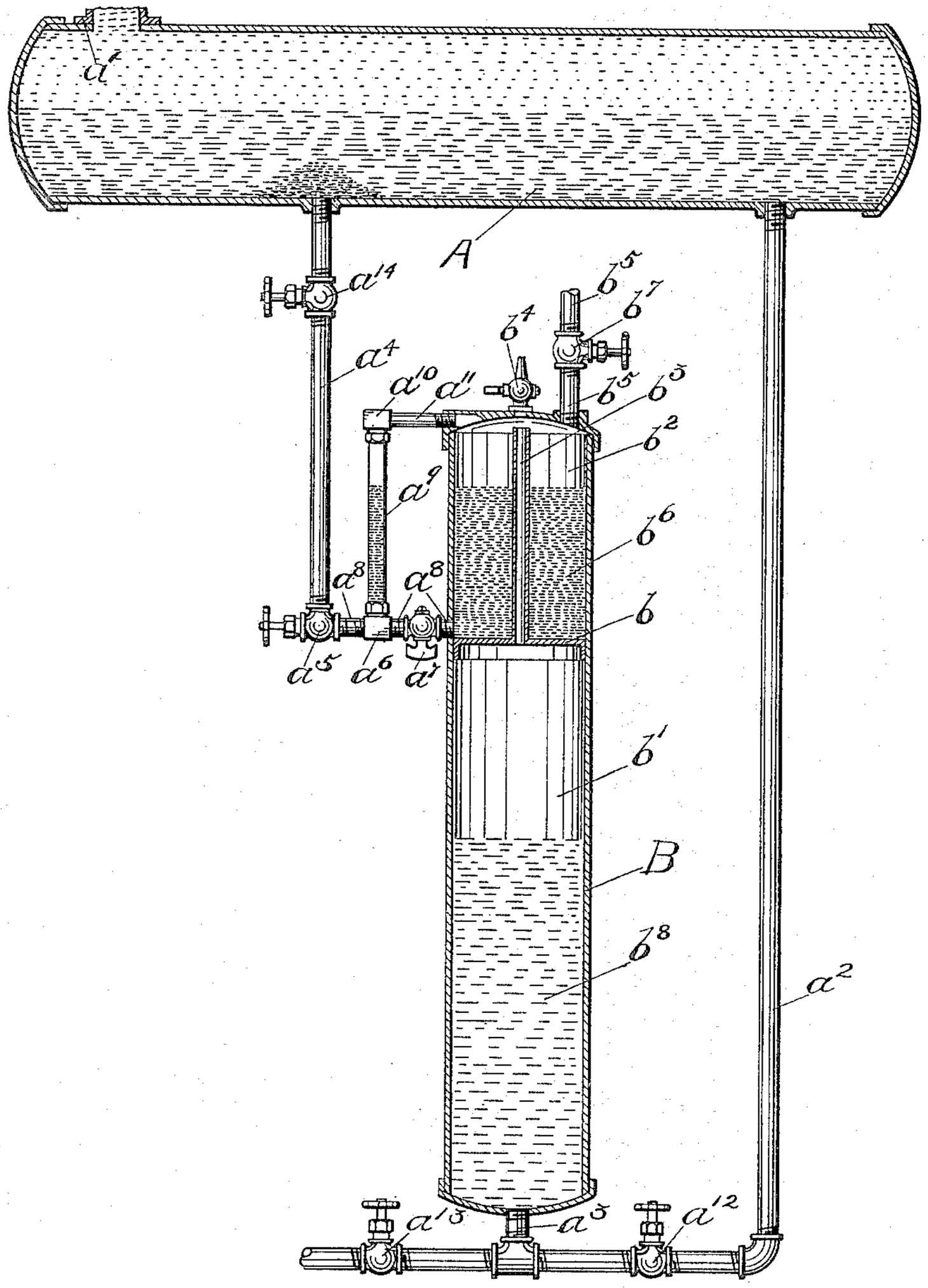
No. 640,306. Patented Jan. 2, 1900.

L. E. JONES.

BOILER COMPOUND FEEDER.

(Application filed May 25, 1899.)

(No Model.)



WITNESSES:

F. J. Smee

M. F. Allen

INVENTOR

BY L. E. Jones

Foree Bain

ATTORNEY.

UNITED STATES PATENT OFFICE.

LABAN E. JONES, OF CHICAGO, ILLINOIS.

BOILER-COMPOUND FEEDER.

SPECIFICATION forming part of Letters Patent No. 640,306, dated January 2, 1900.

Application filed May 25, 1899. Serial No. 718,152. (No model.)

To all whom it may concern:

Be it known that I, LABAN ELSWORTH JONES, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Boiler-Compound Feeders; and I do hereby declare the following to be a full, clear, and exact description, such as will enable persons who are skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in a system of feeding boiler compound or the like into boilers and to the construction of boiler-compound feeders, and it especially has reference to that class of feeders whereby boiler purger, compound, or the like may be fed into a boiler without any exterior apparatus or power being applied for that purpose.

The object of my invention is to provide a new and desirable device whereby a given quantity of material contained within a receptacle of my feeder may be fed into a boiler or other chamber under pressure by the indirect effect of gravity, notwithstanding said material may be located below the chamber into which it is to be fed.

Another object of my invention is to provide an automatic feeder whereby the material contained therein may be fed into the chamber under pressure without any mechanically-moving parts in the construction of or in connection with the said feeder.

Another object of my invention is to provide a timing device whereby the time necessary to feed an amount of material contained therein may be readily ascertained, and, finally, to improve generally the construction and arrangement of automatic feeding devices, whereby the cost of production is small and whereby the results may be accomplished with certainty and regularity.

In the accompanying drawings the figure is an elevation of my feeder, partly in section, connected with a drum forming part of a boiler interior and under pressure.

In the drawing, A is a drum containing water or steam connected to a boiler by pipe a'. This drum could be a pipe or any part of a boiler system containing a liquid or steam. A tank B contains a rigid diaphragm b, which divides the said tank into two chambers b' and b^2. The diaphragm is perforated, preferably, near its center, from which perforation pipe b^3 rises near to the top of chamber b^2, affording a communication between the said chambers b' and b^2. A pipe a^2 leads from the bottom of the drum A and is connected to the bottom of the tank B by nipple a^3. Another pipe a^4 leads from the bottom of the said drum and is connected to the bottom of chamber b^2 through needle-valve a^5, fitting a^6, valve a^7, and nipple a^8. A glass tube a^9 is secured between fittings a^6 and a^{10} and communicates with the top of chamber b^2 through pipe a^{11}. A petcock b^4 is secured into the top of chamber b^2. A pipe b^5, through which the material b^6 to be fed into the boiler is poured into chamber b^2, connects with the same, as shown, and is closed by a valve b^7. Valves a^{12} and a^{13} are located in pipe a^2 and valve a^{14} in pipe a^4, as shown. Water b^8 is contained in chamber b'.

The operation of my device is as follows: To fill the chamber b^2 with a material b^6, such as a boiler-purger, to be fed into the boiler, close valves a^{12} and a^{14} and open valve or pet cock b^4 and a^{13}. The water contained in chamber b' will flow out through pipe a^2 and valve a^{13} and chamber b' will be filled with air drawn in through pet cock b^4. Now open valve b^7, which may communicate with a reservoir containing boiler-purger or the like, and chamber b^2 may be filled with the said purger b^6, after which valves b^7, b^4, and a^{13} should be closed. To feed the compound or purger into the boiler, close needle-valve a^5 and open valves a^{12} and a^{14}. Water from pipe a^2 will enter chamber b' and compress the air contained therein until it assumes the pressure of that of the system. Now open needle-valve a^5, and the pressure upon the top of the compound b^6 within chamber b^2 will cause the compound to be forced out at the bottom of the chamber b^2, through pipe a^8, valves a^7, a^5, and a^{14}, into the drum A. It will be seen that as the water b^8 rises within chamber b' it has the effect to increase the air-pressure. This effect is communicated through tube b^3 to the chamber b^2, and the material contained within the said chamber will be thereby forced out and up through the series of pipes and valves into drum A.

The feeding process may be regulated by

means of needle-valve a^5, which may be set to a desired point and remain so set, as valve a^{14} may be closed when desirable without the necessity of changing needle-valve a^5.

It is of course supposed that the desirability of feeding the compound into a boiler in small continuous quantities through long periods of time is understood and appreciated. By the arrangement shown I am enabled to ascertain just how fast I am feeding the compound into the boiler and how long a time will be required to feed the supply contained at any time within the chamber b^2. This is accomplished in the following manner: I design the tube a^9 to have an interior sectional area of, say, one thirty-six-hundredth part of that of chamber b^2, or one sixtieth the diameter. Suppose now that the material in glass tube a^9 is as shown in the drawing. I close valve a^7 and adjust needle-valve a^5 until all the material within glass a^9 will be fed into drum A, or until it disappears from the glass. Suppose this requires just sixty seconds of time. I thus know that the quantity within chamber b^2 will be fed at the same rate within sixty hours. I therefore open valve a^7 and feed from the bottom of the chamber b^2, leaving the needle-valve a^5 undisturbed. The quantity of material within chamber b^2 may be observed from time to time, as it will always remain at a level within glass tube a^9, corresponding with that in chamber b^2.

Supposing now I desire to use my device to feed into a pipe or boiler containing steam only, I would use exactly the same device, operated in exactly the same manner. As the steam contained in leg A^2 would condense, the water therein would seek a level in exactly the same manner as hereinbefore explained.

My feeder will operate equally as well when placed above or at the side of the chamber into which the compound is to be fed as when placed below, as shown.

It is evident that my device may be employed to feed material other than boiler compound, and that it may also be used to feed into other chambers than boilers. I therefore do not wish to limit myself to the use nor to the construction specifically described.

Having described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A boiler-compound feeder, consisting of a chamber for containing water, a chamber for containing material to be fed into the boiler, and an intervening column of compressed air, the two chambers being connected to the boiler, substantially as set forth.

2. A boiler-compound feeder, consisting of a pipe leading from said boiler, a chamber connected to the said pipe, another pipe leading from said boiler and connected to another chamber, a pipe connecting the two said chambers together, and suitable valves whereby one of the said chambers may be filled with air and compressed by the admission of water therein, for feeding the compound contained within the other chamber into the boiler, substantially as set forth.

3. A boiler-compound feeder, consisting of a tank, a rigid diaphragm dividing said tank into two chambers, a pipe extending from near the top of one of the chambers through said diaphragm, and a pipe connecting each chamber to the boiler, substantially as set forth.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 23d day of May, 1899.

LABAN E. JONES.

Witnesses:
M. F. ALLEN,
F. J. GURLEE.