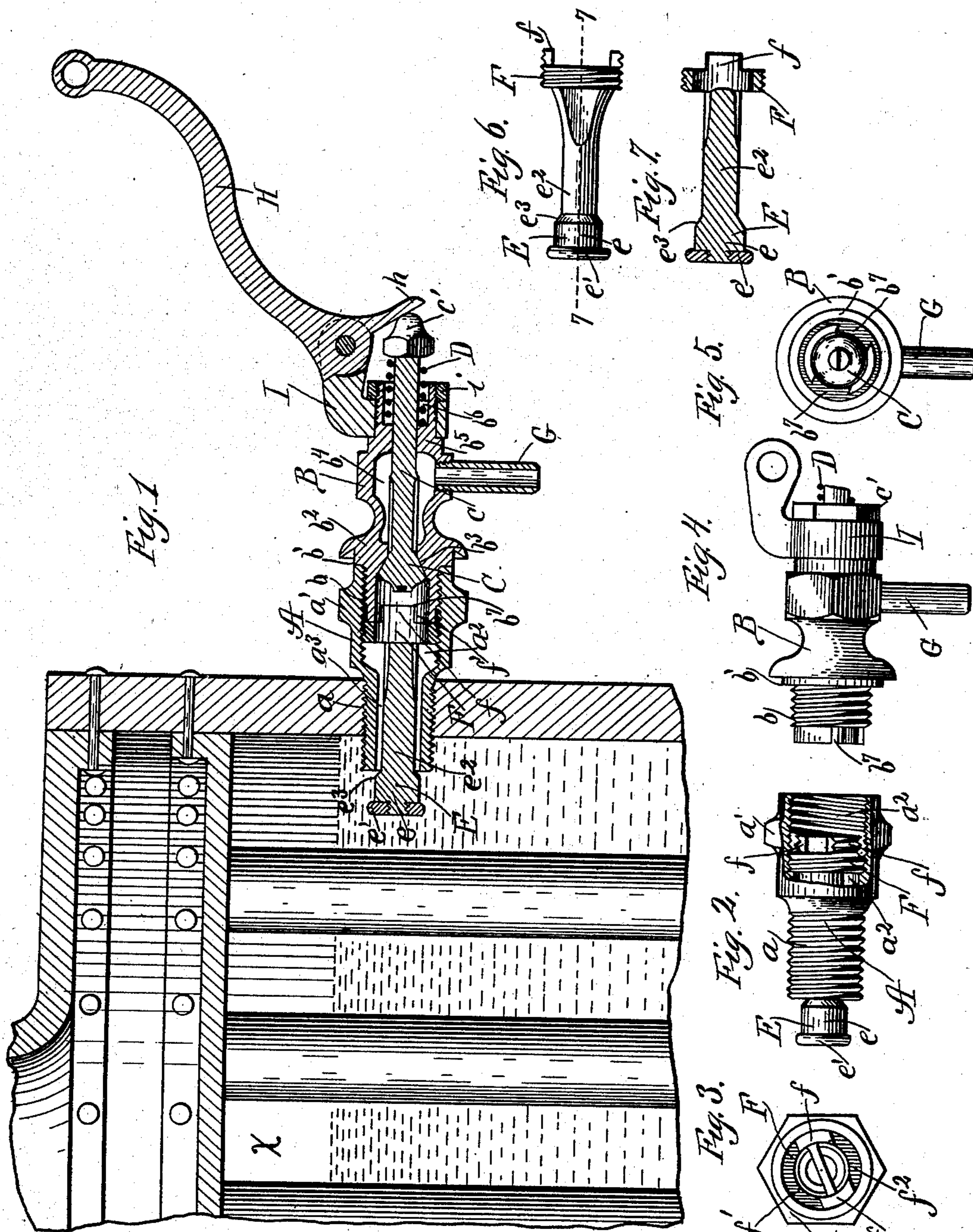


(No Model.)

T. A. DELANEY.
GAGE COCK.

No. 509,879.

Patented Dec. 5, 1893.



Witnesses:

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UNITED STATES PATENT OFFICE.

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GAGE-COCK.

SPECIFICATION forming part of Letters Patent No. 509,879, dated December 5, 1893.

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To all whom it may concern:

Be it known that I, THOMAS A. DELANEY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gage-Cocks, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

10 Figure 1 represents a detail section of a vertical boiler with my improved gage cock applied thereto and also in section; Fig. 2, a side elevation of the gage-cock plug detached and partly broken away; Fig. 3, a front end elevation of the same; Fig. 4, a side elevation of the valve chamber detached; Fig. 5, an inner end elevation of the same; Fig. 6, a side elevation of the stop valve detached; and Fig. 7, a section of the same taken on the line 7-7.
20 In gage-cocks, as usually made, the case is entire and it is impossible to remove the valve for grinding or any other repairs without removing the entire device from the boiler. It is evident that this cannot be done without
25 stopping the operation of the boiler and letting off steam, so that, whenever it is necessary to grind the valve or make other repairs to the main parts of the device, the boiler must be shut down and stand idle until repairs are completed and the gage-cock returned to its place. Obviously this is objectionable because it suspends for a time the work of the boiler; it is the object of my present invention to remedy this defect by a construction of the device, which permits a removal of the valve section only, and, at the same time, stopping the discharge passage, so that the valve may be removed and ground or any other like repairs made, whatever may
30 be the condition of the boiler, and without stopping or in any way interfering with its work.

I will now describe in detail the construction and operation of a gage-cock embodying
45 my invention, and will then define in claims the particular improvements which I believe to be new and wish to secure by Letters Patent.

In the drawings X represents a boiler of any type of construction; the one shown is
50 upright, but this is immaterial. In gage-cocks as heretofore made, the body has been in one

piece, but in my improvement it is composed of two distinct and separate parts, which, however, are adapted to be connected together. For the purpose of distinction these
55 two parts may be called the plug and the valve case, the former being the part which is attached directly to the boiler, and the latter the outer section which contains the valve and is connected to the outer end of the plug. 60

In the drawings, A represents the plug section of the device, which is, of course, hollow, and is provided with an exterior thread at one end, by means of which it is connected to the boiler in the usual way and as seen in
65 Fig. 1, in which a indicates this threaded end. Just outside of this threaded section the plug is enlarged somewhat, as seen at a' , so as to provide an enlarged chamber, a^2 , inside this portion of the plug, the main passage, a^3 , into
70 the boiler being considerably less in diameter. This enlarged section, a' , is threaded internally, as also seen in Fig. 1.

The outer section, B, of the device may be called the valve case, for the valve is mounted
75 and seated in this part. This case section is provided with an externally threaded inner end, b , which is adapted to fit the internal thread of the chamber, a' , of the plug, so that the two may be connected by turning this end
80 of the outer part into the said threaded chamber. Just back of this threaded end, b , is a shoulder, b' , which is intended to fit down closely upon the outer end of the plug when the case section is turned home; and about
85 in the same plane with this shoulder is the diaphragm, b^2 , which is perforated and constructed to provide a seat for the main valve, C. As shown in the drawings, this seat is conical, as seen at b^3 in Fig. 1, to suit the
90 conical shape of the valve, C. The particular shape of the valve and its seat is, however, a matter of judgment and may be changed if desired. This outer section of the body contains a central chamber, b^4 , and the central
95 aperture in the diaphragm opens into this chamber, and so provides communication between the latter and the plug, which communication is controlled by the valve, C, as usual. As here shown, the main valve, C, is
100 designed to open inward, for this purpose the stem, c , of the valve being extended outward

through the chamber, b^4 , and the outer end or head, b^5 , of the case, B. The valve is controlled as usual by means of a spring coil, D, surrounding the outer end of the valve-stem and held in place by a nut, c' , turned on the stem, being seated at its inner end in a recess, b^6 , in the head of the section, B, as seen in Fig. 1. Obviously the spring acts to hold the valve to its seat and yields to permit the latter to be unseated by forcing the stem inward in any usual way.

Now, as thus far described, the device will be operated only as any ordinary gage-cock. But in addition to these devices, I provide a kind of supplementary valve or stop valve, E, which is adapted to close the passage through the plug under certain conditions, and, thereby, permit the detachment of the case section, B, at any time and under any condition of the boiler. The head, e , of this valve is adapted to nicely fit the smaller passage, a^3 , of the plug. At the outer end of this head there is a slight flange or collar, e' , which is adapted to be seated on the end of the plug when the valve is drawn into the latter, and thus close the passage. The stem, e^2 , of this valve extends outward within the plug and is provided at its opposite end with a ring, F, of a size to correspond with the chamber, a^2 , and threaded externally to adapt it to engage with the internal thread of said chamber. Where the valve head is joined to the stem the head is beveled down, as seen at e^3 , and so the stem is somewhat smaller than the head. This provides for a passage in the plug around this valve stem, and this passage will be opened when the head is moved into the boiler sufficiently far to project entirely out from the plug, as seen in Fig. 1. From the description above of the threaded ring on the end of this supplemental valve stem, it is evident that the valve is adjusted lengthwise of the plug by turning this ring, and I provide for doing this by means of the valve case, B, as it is turned in and out of its connection with the plug. To effect this, these two parts must be detachably connected, and this I accomplish by providing two lugs, f , on the outer edge of the ring, which, of course, are threaded the same as the latter, and two recesses, b^7 , in the edge of the inner tubular end of the valve case, the recesses being made to correspond with the said lugs so as to receive the same, and thereby connect the stop valve with the main valve case. When these two parts are thus connected, it is obvious that the valve must be turned with the case, but in order to accomplish this result the threading on the two must exactly correspond so that the thread on one will be simply a continuation of that on the other; otherwise it is obvious that they cannot be turned in unison. It is also evident that the means for connecting these two parts must be constructed so that the connection can be made only when they are in such a relative position that the threads on the two will properly connect

as suggested above. In order to insure this result I make the space between the lugs on the ring less on one side of the latter than on the other, as shown in Fig. 3 of the drawings, in which it will be seen that the space, f' , between the lugs on one side is considerably longer than the space, f^2 , on the other side. The recesses in the tubular end of the valve case are similarly arranged, so that the latter can be connected to the former only when they are brought together with the lugs and recesses relatively arranged in this particular. The exterior of the lugs on the ring is threaded in continuance of the thread on the ring, but the portions at the tubular end of the valve case, standing between the recesses therein, may be left plain, as seen in Fig. 4; the thread on the end of the valve case, however, being made to correspond with that on the ring, it, of course, conforms to that on the ring lugs, and so there is practically a continuation of the thread, with two blank spaces, however, on each side at the point of junction.

In connecting up the two parts they may be joined, as described above, and then turned together into the plug, or the ring may first be engaged with the plug and set in a slight distance and the case then engaged therewith, when the two are turned in together until the case is seated on the end of the plug. The parts are so constructed and arranged relatively to each other that, when thus adjusted, the supplementary or stop valve will be projected into the boiler from the inner end of the plug, so as to provide a passage for water or steam into the latter, as seen in Fig. 1. The valve case is provided with a discharge pipe or nozzle, G, opening into the chamber in the valve case, and thus providing an outlet therefrom. I also provide the usual lever handle, H, which is pivotally mounted on a ring bracket, I, applied to the outer end of the valve case. The lever is constructed with a tappet or toe piece, h , and the parts are mounted so that this toe is brought in contact with the outer end of the main valve stem. The ring bracket is secured in place on the end of the valve case by an annular nut, i . These are ordinary devices, and the lever acts in the usual way to drive the valve stem inward, thereby unseating the valve and so opening a passage from the boiler to the atmosphere, thereby making the usual test. Now, if the main valve requires grinding, or any other repairs are necessary to parts about the valve case, the latter is simply turned out from its threaded connection with the plug, while the plug itself remains inserted in the boiler; but this turning back of the case also turns the stop valve ring in the same direction, setting it back in its threaded seat along with the case. Obviously this draws the stop valve back into the plug, and the parts are so arranged that, just as the collar on the said valve head is brought down to its seat, the thread on the main valve case is disconnected from the plug,

and, of course, the valve case may be drawn straight out from the latter, leaving the ring in position. The plug is, therefore, securely stopped by the stop valve, which will be securely held in this adjustment until the valve case is again inserted and connected with the ring. The main valve case being now entirely detached from the plug, any repairs necessary to the valve or any other parts may be made, while, at the same time, the plug remains inserted in the boiler, but being securely stopped, the working of the boiler need not be arrested a single moment. When repairs are completed and it is desired to return the valve case to its place, the proper connection between the case and stop valve to permit them to be turned together is insured by the means described above, which permit the connection to be made only when the parts are brought into precisely the same relative position in which they were, when disconnected.

There may be some changes in devices and in special construction thereof. It is evident that an elastic device, such as a spring, might be used with this stop valve instead of the threaded connection, but any such means is objectionable because of the danger of inaction by the interference of matter collected about the spring. I have found that some means, for positively moving the stop valve as required, is almost an absolute necessity to the successful working of this invention, though I do not wish to be understood as strictly limiting my invention to such a construction.

Having thus described my invention, what I believe to be new, and wish to secure by Letters Patent, is—

1. In a gage-cock, a hollow plug having a stem smaller than the latter adapted to be inserted in the boiler and forming the outlet therefrom, in combination with a separate main valve case adapted to be connected to and disconnected from the plug, a supple-

mental or stop-valve arranged in the plug and connected with the valve case, whereby the stop-valve is moved to open and close the plug passage by the movement of the valve case in connecting to and disconnecting from the plug, substantially as described.

2. In a gage-cock, a hollow outlet plug, A, adapted to be inserted in the boiler and provided with an internally threaded enlarged chamber a^2 at its outer end, in combination with the main valve case, B, separate from the plug and provided with a tubular inner end, b , externally threaded to fit the internal thread of the plug and having recesses or notches, b^6 , sunk in its edges, and a supplemental or stop-valve, E, adapted to close the passage in the plug and provided with a ring, F, externally threaded to correspond with the thread on the end of the valve case, and fitting the threaded chamber a^2 and having lugs, f , adapted to fit the said recesses in the end of the valve case, substantially as described.

3. In a gage-cock, the separate outlet plug, A, provided with an enlarged internally threaded chamber, a^2 , in combination with a separate valve case, B, provided with externally threaded tubular end, b , having edge notches, b^7 , therein arranged at unequal distances apart, the supplemental valve, E, having an enlarged head, e , adapted to close the plug passage, and a ring, F, on the stem of said valve adapted to fit the threaded chamber in the plug and threaded to correspond with the external thread on the end of the valve case, and provided with lugs, f , arranged at unequal distances from each other, whereby they are adapted to enter the corresponding recesses in the end of the valve case, substantially as described.

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Witnesses:

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