(No Model.) 3 Sheets—Sheet 1.

M. ABRAMS & F. L. McGAHAN.

SEDIMENT TRAP FOR BOILERS.

No. 456,711. Patented July 28, 1891.

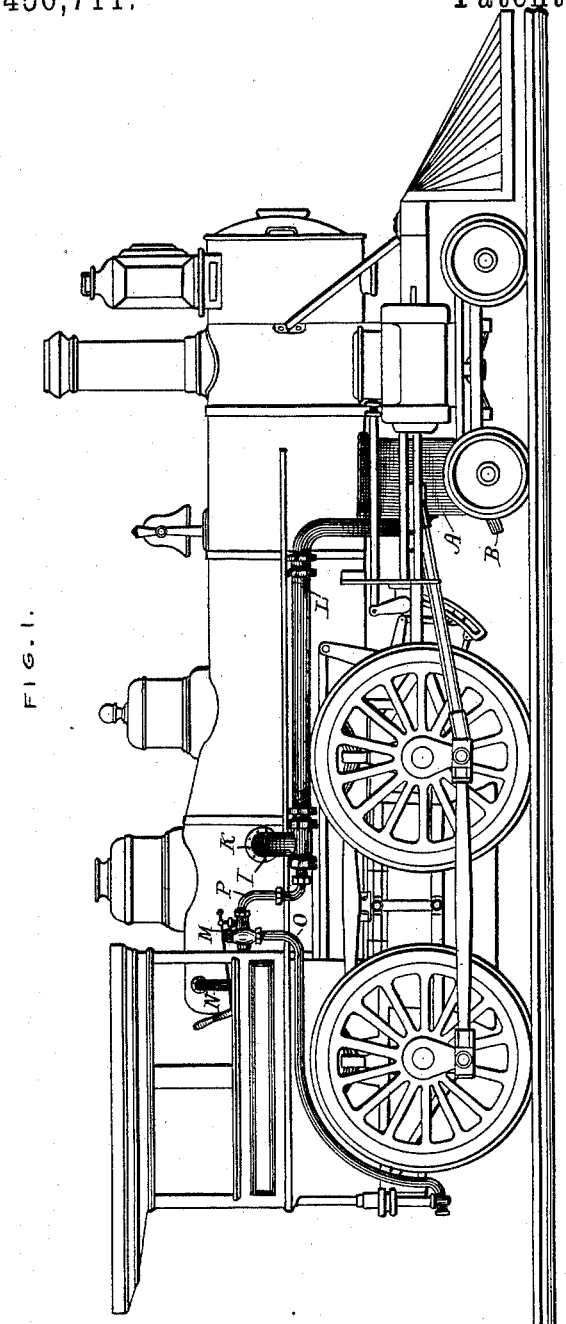

FIG. 1.

FIG. 5.

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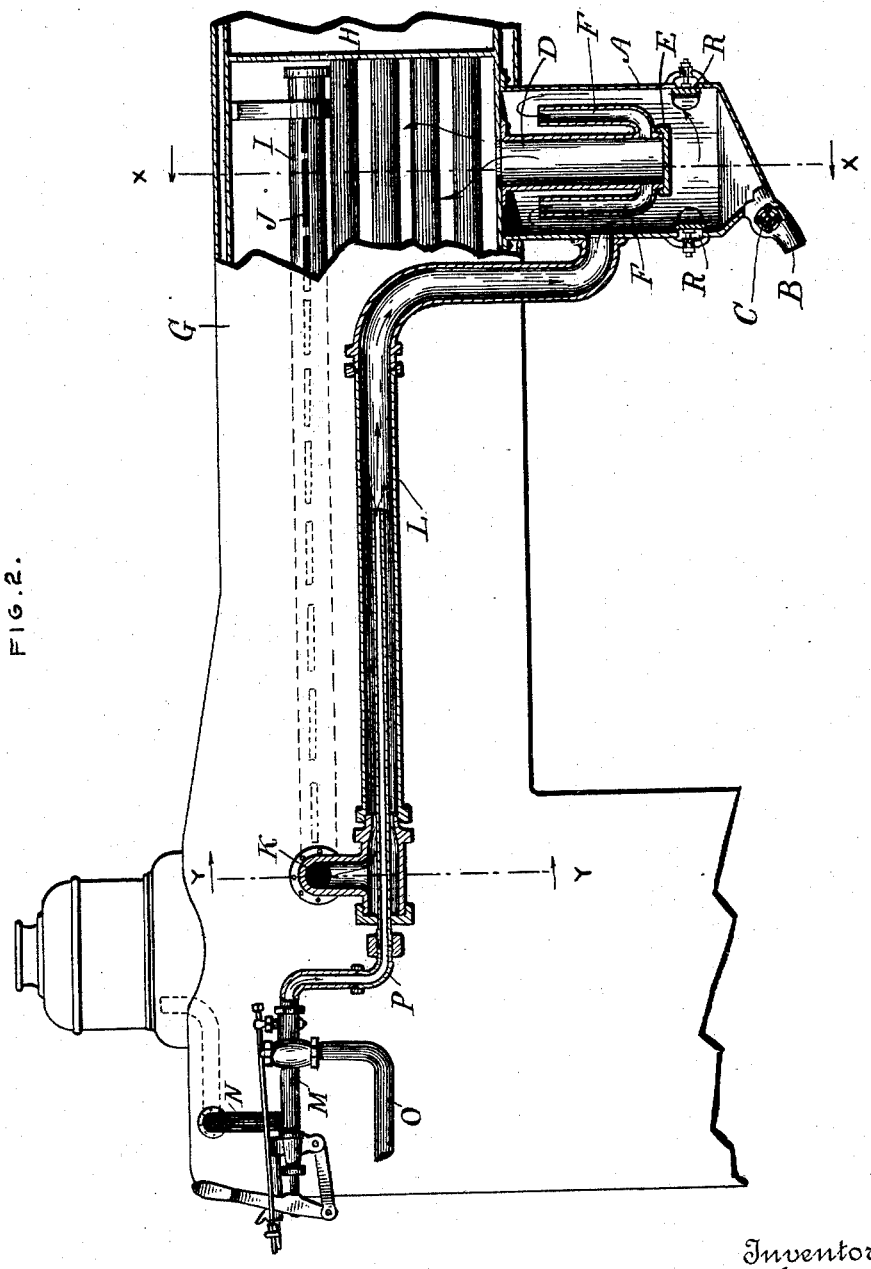

FIG. 2.

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FIG. 4.

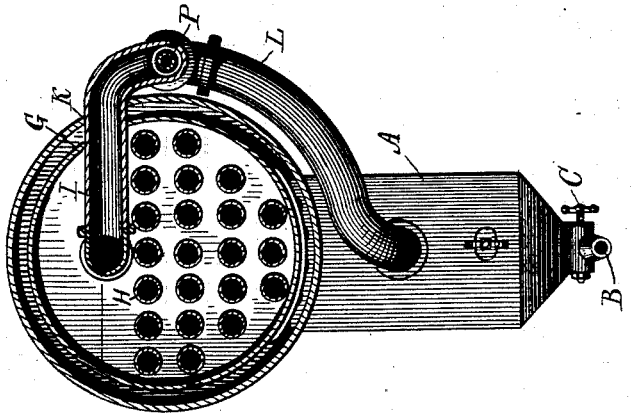
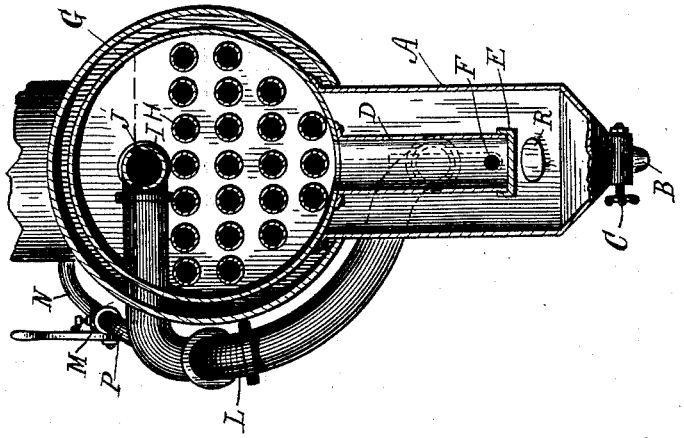


FIG. 3.



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UNITED STATES PATENT OFFICE.

MILTON ABRAMS AND FRED. L. McGAHAN, OF INDIANAPOLIS, INDIANA.

SEDIMENT-TRAP FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 456,711, dated July 28, 1891.

Application filed May 9, 1891. Serial No. 392,215. (No model.)

To all whom it may concern:

Be it known that we, MILTON ABRAMS and FRED. L. McGAHAN, citizens of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Improvement in Sediment-Traps for Locomotive-Boilers, of which the following is a specification.

Our invention relates to an improved device for separating impurities in feed-water for locomotive and other tubular steam-boilers.

The object of our improvement is to provide means whereby the salts and other mineral substances held in solution in the feed-water of a locomotive-boiler, and which before precipitation first rise to the surface of the water, may be removed from the boiler and deposited in a suitable receptacle remote from the highly-heated portion of the boiler, thereby preventing the deposit of sediment and the formation of scale within the boiler, all as hereinafter fully set forth.

The accompanying drawings illustrate our invention.

Figure 1 represents a side elevation of a locomotive having our device applied thereto. Fig. 2 represents a side elevation of the boiler, shown partly in section, and our device in position thereon and shown in section. Fig. 3 represents a section at *x*, Fig. 2, looking from the front of the boiler backward. Fig. 4 represents a section at *y*, Fig. 2, looking forward. Fig. 5 represents a side elevation of the skimming-pipe.

In the drawings, A designates the sediment-chamber, formed, preferably, of boiler-iron and riveted to the under side of the boiler just back of the "saddle-casting." The sediment-chamber is provided at its lower end with a waste-pipe B, which is closed by a blow-off valve C. The interior of chamber A communicates with the interior of the boiler through a central pipe D, which is closed at its lower end by a removable cap E, and is provided with vertical branches F F, which are open at their upper ends.

Arranged centrally within the boiler G and above the flues H is the skimming-pipe I, which is provided along its sides with a series of slotted openings J. The rear end of the skimming-pipe I passes out through the side of the boiler at K, and is connected with the interior of the sediment-chamber A by means of a pipe L, which enters the sediment-chamber below the open upper ends of the branches F of the pipe D. The rear end of pipe L is closed.

M is an ordinary steam-injector, which is supplied with steam from the dome of the boiler through the pipe N.

O is the feed-water pipe connected with the injector.

The injector and feed-water pipe are connected with and discharge into pipe L by means of pipe P, of considerably smaller diameter than pipe L and extending about two-thirds of its length, the arrangement being such that the current entering pipe L through pipe P operates to form a partial vacuum at the point of connection between the skimming-pipe and pipe L.

Suitable hand-holes R R are provided in chamber A, so as to permit access to its interior and to the lower end of pipe D.

The operation of our device is as follows: The boiler having been filled with water to the line of the openings J in pipe I and steam having been raised, lime and other matter held in solution or suspension, being heated, rise to the surface of the water in the boiler. The injector having been put in operation, the feed-water is forced with a strong current through pipe P into pipe L and passes from thence into the sediment-chamber A and through the branches F F and pipe D into the boiler at its under side. The current thus formed produces a partial vacuum in pipe I, and the scum rising on the surface of the water in the boiler is thereby drawn through slots J into said pipe and out through pipe L and discharged along with the feed-water into chamber A, where the sediment, being chilled and saturated by the feed-water, sinks to the bottom of chamber A, from whence it may be discharged through the pipe B or removed through the hand-holes R.

We claim as our invention—

1. The combination of the steam-boiler, the sediment-chamber secured to the under side of the boiler and arranged to discharge up-

ward through the bottom of the boiler, the perforated pipe mounted within the boiler above the flues and extending out through the sides of the boiler, the pipe connecting said perforated pipe and sediment-chamber, the feed-water pipe extending within said connecting-pipe, and means for forcing a current of feed-water for the boiler through said feed-water and connecting pipes, all combined and arranged to co-operate substantially as and for the purpose set forth.

2. The combination of the steam-boiler, the sediment-chamber secured to the under side of said boiler, the pipe D, arranged within the sediment-chamber, closed at its lower end, having the vertical branches F F and arranged to establish communication between the sediment-chamber and the interior of the boiler, the perforated pipe mounted within the boiler above the flues and extending out through the side of the boiler, the pipe connecting said perforated pipe and sediment-chamber, the feed-water pipe extending within said connecting-pipe, and means for forcing a current of feed-water for the boiler through said feed-water pipe and said connecting-pipe, all combined and arranged to co-operate substantially as and for the purpose set forth.

MILTON ABRAMS.
FRED. L. MCGAHAN.

Witnesses:
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V. M. HOOD.