(No Model.)

2 Sheets—Sheet 1.

J. NICKLE & A. NELSON.

STEAM BOILER FILTER.

No. 335,948. Patented Feb. 9, 1886.

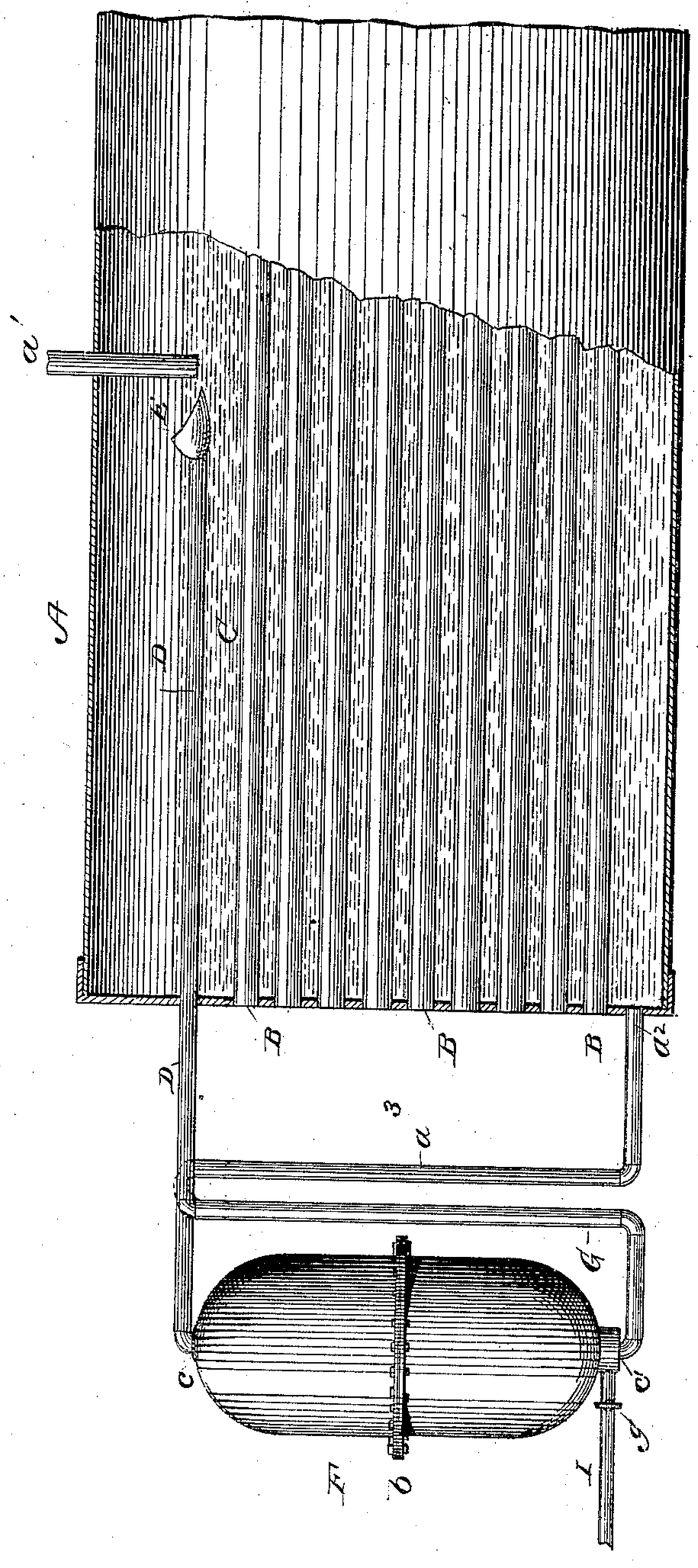

Fig. 1.

WITNESSES

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Fig. 2.

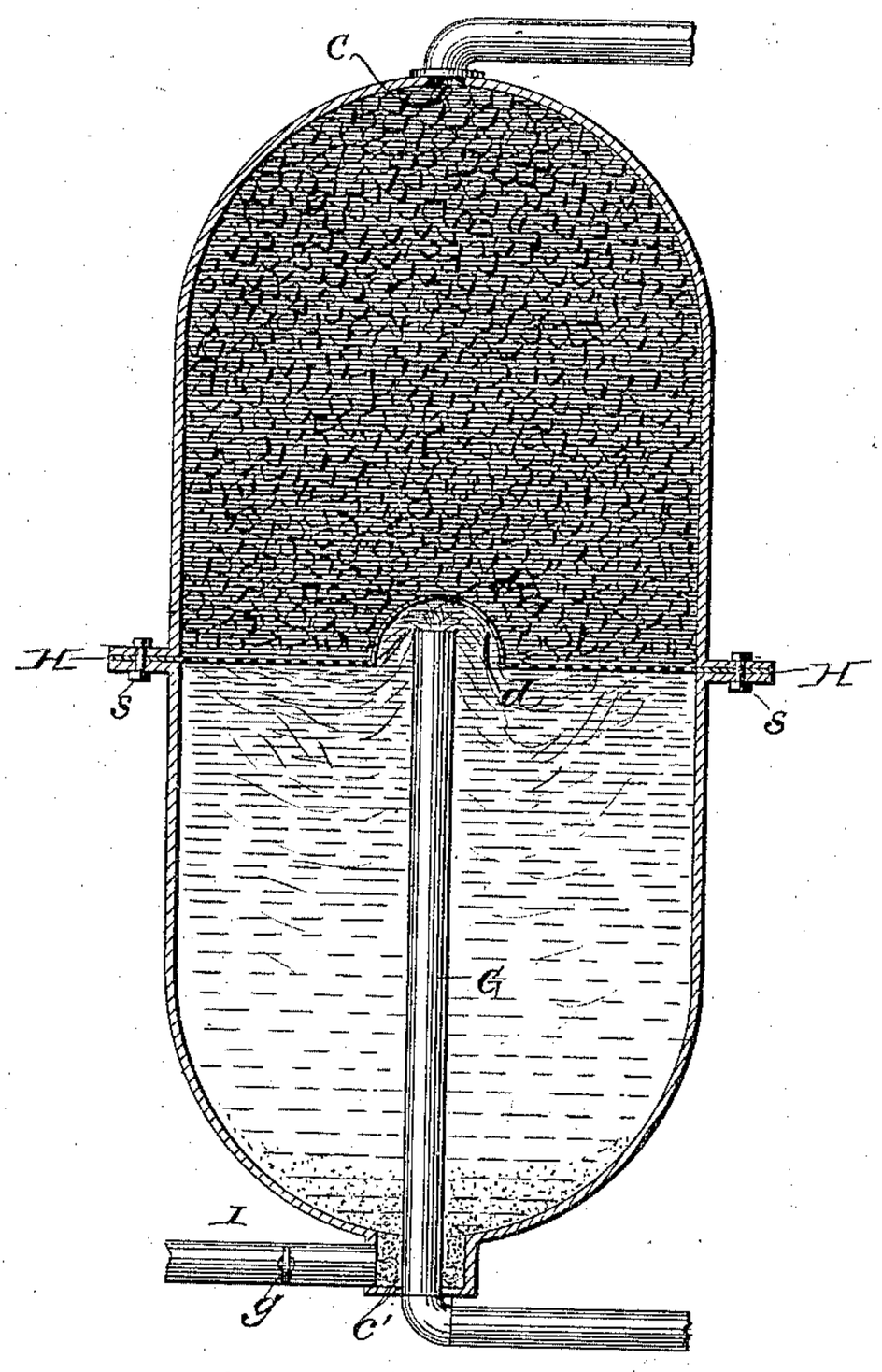
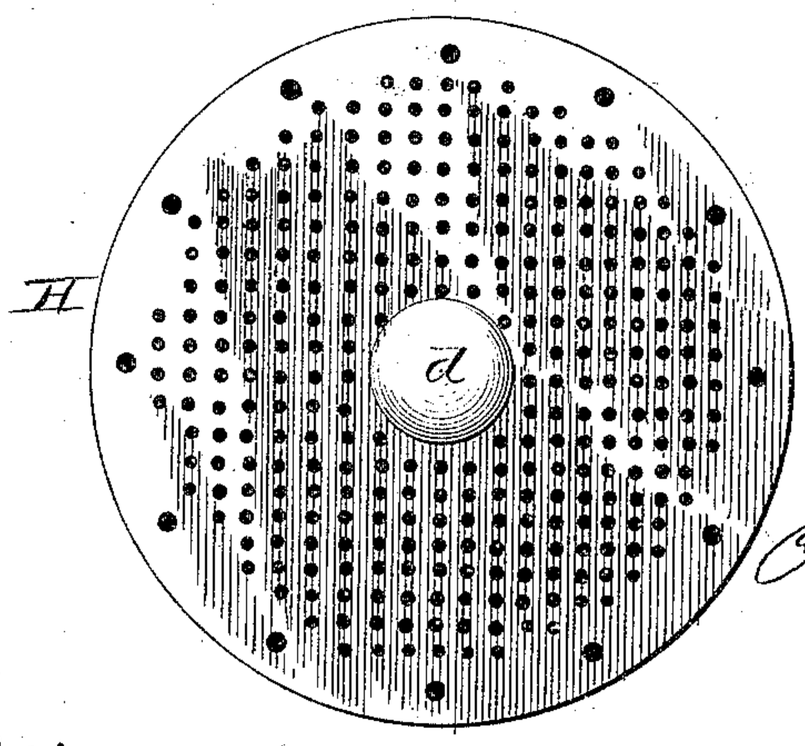


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN NICKLE AND ALLEN NELSON, OF GRAND FORKS, DAKOTA TERRITORY.

STEAM-BOILER FILTER.

SPECIFICATION forming part of Letters Patent No. 335,948, dated February 9, 1886.

Application filed November 7, 1885. Serial No. 182,142. (No model.)

To all whom it may concern:

Be it known that we, JOHN NICKLE and ALLEN NELSON, citizens of the United States, residing at Grand Forks, in the county of Grand Forks and Territory of Dakota, have invented certain new and useful Improvements in Steam-Boiler Filters; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to a device adapted to be attached to steam-boilers, and is designed to filter or purify the water previous to its entrance in the boiler-tubes, and thereby prevent an accumulation of lime or other deposits in said tubes.

The object of the invention is to provide a device of the character mentioned, which shall be simple in its construction, readily and easily applied, and one that may be manufactured and supplied at a slight cost.

With these and other objects in view the invention consists in the combination, with a boiler, of a filter or cleaner connected with the skimmer and with the boiler.

The invention further consists in the improved construction and combinations of parts hereinafter fully described, and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a boiler, partly in section, showing our improved filter applied. Fig. 2 is a detail sectional view of the filter, and Fig. 3 is a detail view of the plate which divides the filter into two parts or sections, said plate being removed.

Corresponding parts in the several figures are denoted by the same letters of reference.

Referring to the drawings, A represents the boiler, B the tubes thereof, and C the water-chamber, located at the upper end of the boiler above the tubes, and extending the entire length of the boiler.

D represents a pipe which is located in the chamber C, and upon the inner end of which is arranged a skimmer, E, of any well-known suitable construction.

Communicating with the boiler-chamber C is a pipe, a', by which the water is fed to the chamber, the lower or outlet end of said pipe being preferably located below the water-line, as shown.

At the front end of the boiler and in the lower end thereof is a pipe, a^2, which connects with the filter, as will be more fully described, and which supplies the water to the tubes.

F represents the filter, which is arranged outside of the boiler at the front end thereof, and below the water-line, as shown. The filter F preferably consists of two sections formed with flanges b, which flanges are bolted together to join the sections. In the upper and lower ends of the filter are formed openings c c'. The opening c, which is located in the upper end of the filter, is connected with the pipe a^2 in the lower end of the boiler by a pipe, a^3, which extends downwardly, while the lower opening in the end of the filter is connected with the pipe D, having the skimmer at its inner end, by a pipe, G, which extends up into the filter beyond the lower end of the upper section.

H represents a plate, which is secured in place between the flanges of the sections composing the filter by the bolts which secure said sections together. This plate is provided at its center with a raised portion, d, which is located directly over the upper end of the pipe G, said raised portion being imperforate, while the remainder of the plate is foraminous.

I represents a pipe communicating with the lower section of the filter, and designed for use to blow out the sediment from said lower section, said pipe being provided with a stop-cock, g.

The operation is as follows: Water is fed to the chamber C, and passes through the skimmer and through the pipe G to the lower end of the filter, and, as said filter is located below the water-level in the chamber C, the water passes up through pipe G. The imperforate raised portion of the dividing-plate prevents mud or like material from passing into the upper section, which is filled with a filtering material. The sediment settles in the lower section of the filter, while the water passes up through the openings in the dividing-plate through the upper section, and through pipe a^3 to the lower end of the boiler. It will thus be seen that the water is thoroughly filtered and the

sediment removed therefrom previous to its entrance in the boiler-tubes.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a boiler, of a filter divided into sections by a perforated plate having an imperforate central portion and pipes connecting the filter and the boiler, substantially as set forth.

2. The combination, with a boiler, of a filter divided into two sections by a perforated plate having an imperforate raised central portion, a pipe having its end located adjacent to said plate and leading to the upper end of the boiler, and a pipe leading from the lower end of the boiler to the upper end of the filter, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN NICKLE.
ALLEN NELSON.

Witnesses:
J. Z. SMITH,
J. W. LYNSON.