C. S. FRENCH.

SAND DRIER.

APPLICATION FILED AUG. 3, 1908.

933,898. Patented Sept. 14, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

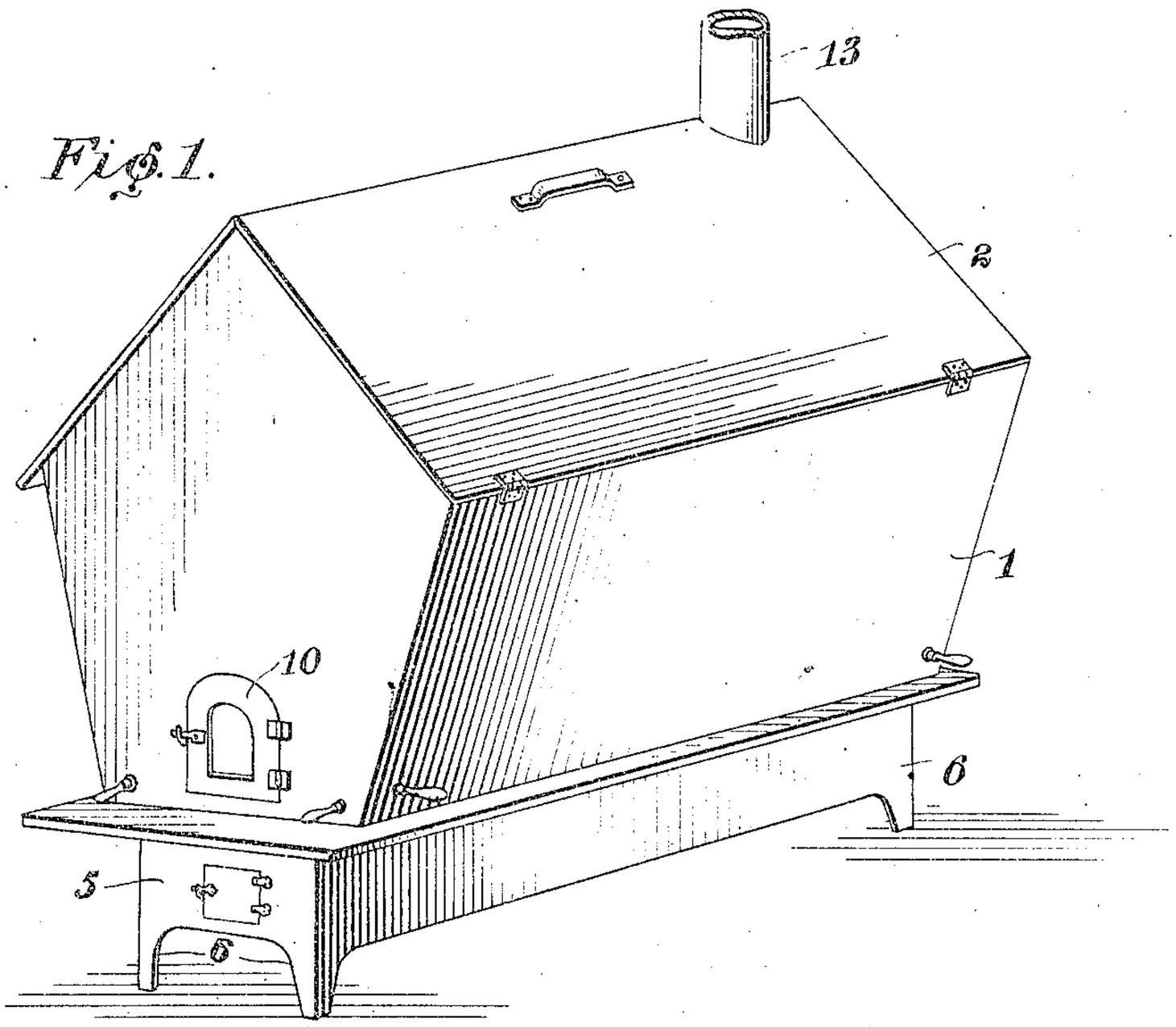
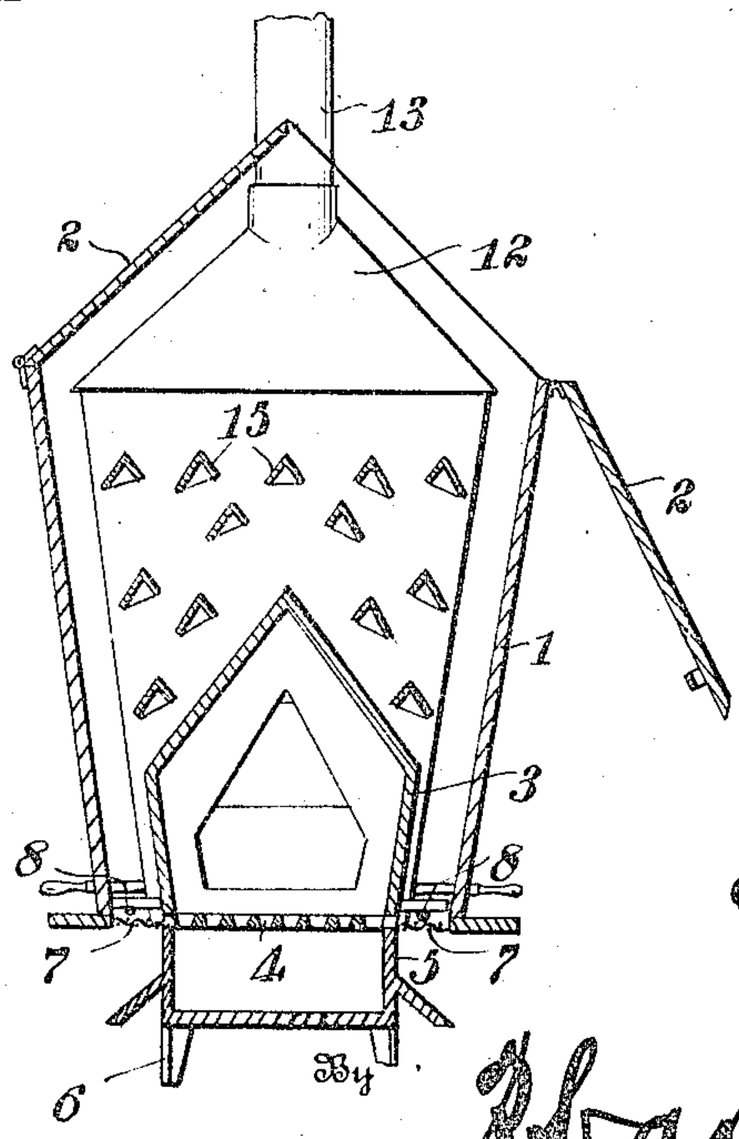


Fig. 2.



Witnesses

J. A. Bishop

W. A. Woodson

Inventor

C. S. French,

By

R. H. & A. Macy, Attorneys

C. S. FRENCH.

SAND DRIER.

APPLICATION FILED AUG. 3, 1908.

933,898.

Patented Sept. 14, 1909.

2 SHEETS—SHEET 2.

Fig. 3.

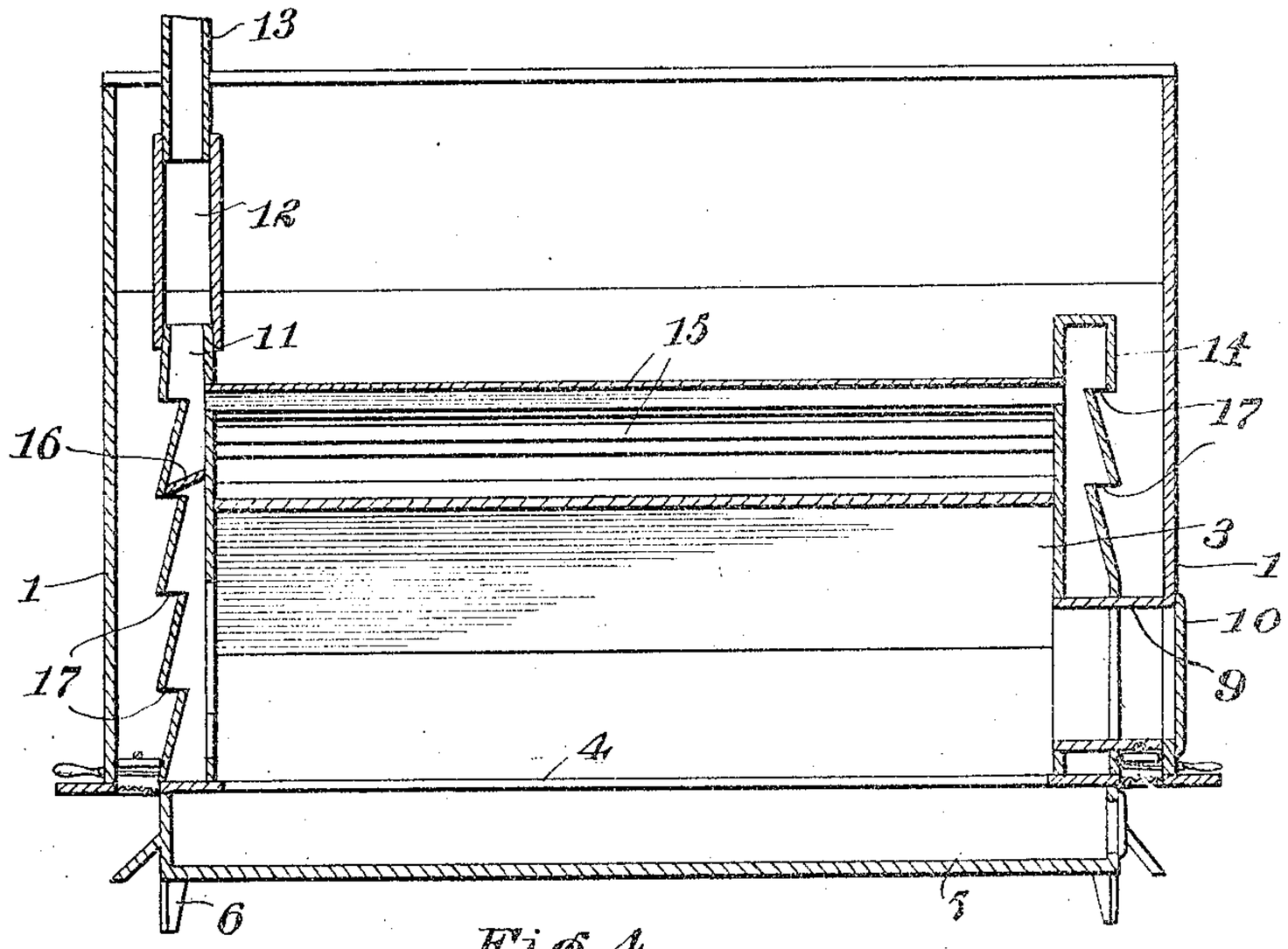
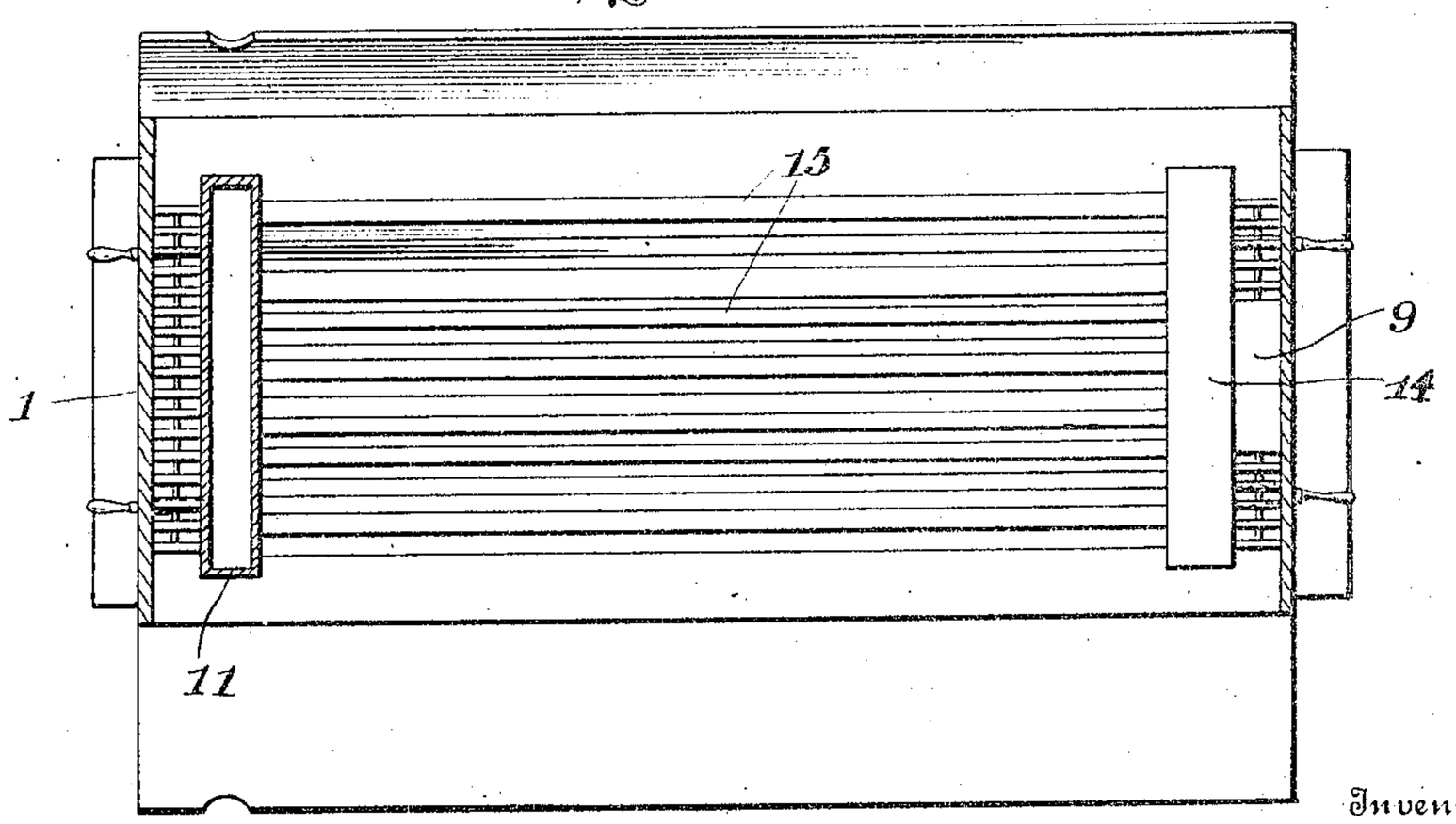


Fig. 4.



Witnesses

J. A. Bishop.

W. P. Hodson

Inventor

C. S. French.

By Thos. A. Macey. Attorneys

UNITED STATES PATENT OFFICE.

CHARLES S. FRENCH, OF JARED, WEST VIRGINIA.

SAND-DRIER.

933,898. Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed August 3, 1908. Serial No. 446,648.

To all whom it may concern:

Be it known that I, CHARLES S. FRENCH, citizen of the United States, residing at Jared, in the county of McDowell and State of West Virginia, have invented certain new and useful Improvements in Sand-Driers, of which the following is a specification.

This invention relates to improvements in sand driers of that type which are formed with a plurality of flues over which the sand or like material is passed.

The object of the invention is the provision of a durable and inexpensive sand drier which will operate in a quick and effective manner to expel the moisture from sand or like material passed through the same.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a perspective view of a sand drier embodying the invention. Fig. 2 is a transverse sectional view through the same. Fig. 3 is a longitudinal vertical sectional view. Fig. 4 is a horizontal sectional view through the upper portion of the drier.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates the jacket or outer casing, the sides of the outer casing being flared upwardly and the top of the casing being inclined downwardly in opposite directions from the central portion thereof and closed by the hinged doors 2. Arranged within the lower portion of the outer casing is a fire box 3, the top of the fire box being formed of walls which incline downwardly so that any sand or like material will be deflected to one side of the fire box and will not lodge thereon. The usual grate bars 4 are located at the bottom of the fire box and an ash pan 5 is disposed under the grate bars, legs 6 being shown as provided for supporting the ash pan and holding it in a slightly elevated position. The bottom of the jacket 1 is somewhat larger than the fire box 3 and a screen 7 is stretched across the space between the two members. The sand passing through the drier accumulates upon this screen 7 and a shaker 8 is employed for causing the sand to pass through the screen as soon as it has been thoroughly dried. These shakers may be operated in any suitable manner, and in the present instance are shown as provided with handles 8ª which project upon the exterior of the casing for that purpose. One end of the fire box 3 communicates with the exterior of the outer casing 1 through the passage 9 which is normally closed by a door 10 and through which fuel is thrust into the fire box. The opposite end of the fire box communicates with a vertical flue 11 the upper end of which is connected by a sleeve 12 to a smoke pipe 13, the lower portion of the sleeve which engages the flue being rectangular in shape while the upper portion which engages the smoke pipe is circular in shape. A second vertical flue 14 extends upwardly from the opposite end of the smoke box and the two vertical flues are connected by the horizontal flues 15, the lower sides of the horizontal flues being open while the tops of the flues are inclined downwardly in opposite directions so that any sand or like material will not lodge thereon but will be deflected to one side. It may also be mentioned that the lower horizontal flues are preferably arranged under the spaces between the upper horizontal flues so that the sand in its descent will be deflected from one flue to another flue and will come in contact with a large amount of heated surface. The top of the vertical flue 14 is closed while the vertical flue 11 is provided at an intermediate point in its length with a transverse partition 16. With this construction it will be obvious that the products of combustion from the fire box will first enter the lower portion of the vertical flue 11 below the transverse partition 16 and will then pass through the lower horizontal flues 15 to the opposite vertical flue 14. From the vertical flue 14 the products of combustion will pass through the upper horizontal flues to the upper portion of the vertical flue 11 above the transverse partition 16 and thence through the smoke pipe 13. The outer faces of the vertical flues 11 and 14 are formed with the downwardly facing openings 17 which serve to lead any steam or vapor given off by the heated sand into the vertical flues from whence it is discharged through the smoke pipe.

In the operation of the invention the sand or other material to be dried is inserted into the jacket or outer casing at the top thereof

and falls over the various horizontal flues 15 and the fire box, the said members being formed with inclined surfaces which deflect the sand and prevent it from lodging thereon. After passing over the flues and fire box which are heated so as to expel the moisture the sand accumulates upon the screen 7 at the sides of the fire box. As soon as this sand has become thoroughly dried it is caused to pass through the screen by means of the shaker 8.

Attention is directed to the fact that the steam and vapors issuing from the sand find ready entrance into the system of flues and are discharged through the smoke pipe, the steam and vapor entering the flues either through the downwardly facing openings of the vertical flues or the open bottoms of the horizontal flues.

Having thus described the invention, what is claimed as new is:

1. In a drier, the combination of an outer casing, a fire box arranged within the outer casing, and a vertical flue communicating with the fire box and formed in one of its sides with downwardly facing openings designed to receive vapors from the interior of the outer casing.

2. In a drier, the combination of an outer casing, vertical flues arranged within the outer casing and formed with downwardly facing openings, horizontal flues connecting the vertical flues, and a fire box for passing heated air through the flues.

3. In a drier, the combination of an outer casing, vertical flues arranged within the outer casing and formed with downwardly facing openings, horizontal flues connecting the vertical flues, each of the horizontal flues being formed with an open bottom and an inclined top, and a fire box for passing heated air through the flues.

4. In a drier, the combination of an outer casing, a fire box arranged within the outer casing, vertical flues extending upwardly from the ends of the fire box, the lower end of one of the vertical flues communicating with the fire box and being provided at an intermediate point in its length with a transverse partition, and horizontal flues connecting the vertical flues, a portion of the horizontal flues communicating with the before mentioned vertical flue below the transverse partition while the opposite horizontal flues communicate therewith above the transverse partition.

5. In a drier, the combination of an outer casing, a fire box arranged within the outer casing, a screen at the bottom of the outer casing, a system of flues arranged within the outer casing and heated by the products of combustion from the fire box, and a shaker for causing the sand or like material to pass through the screen.

6. In a drier, the combination of an outer casing having the bottom thereof open, a fire box arranged within the lower portion of the outer casing and formed with an inclined top, a screen at the bottom of the outer casing, the said screen being stretched across the space between the outer casing and the fire box, vertical flues at the ends of the fire box, the said vertical flues being formed with downwardly facing openings, a smoke pipe communicating with one of the vertical flues, a transverse partition at an intermediate point in the length of the said flue and horizontal flues connecting the vertical flues.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES S. FRENCH. [L. S.]

Witnesses:
C. C. HALE,
N. A. MICHELSON.