C. S. DEAN.

Fire-Stop for Steam-Boiler Flues.

No. 215,583. Patented May 20, 1879.

Fig. 1.

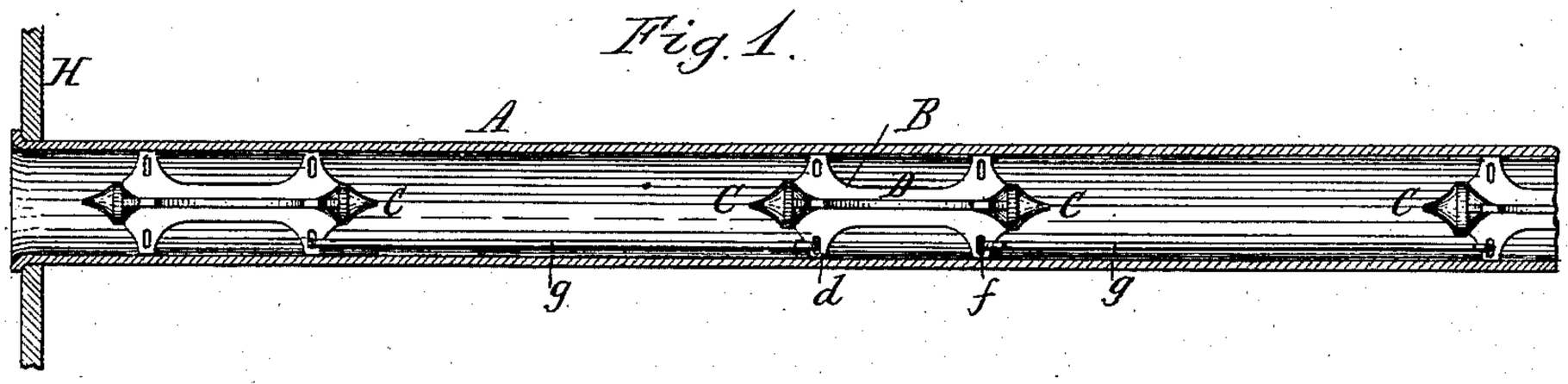


Fig. 2.

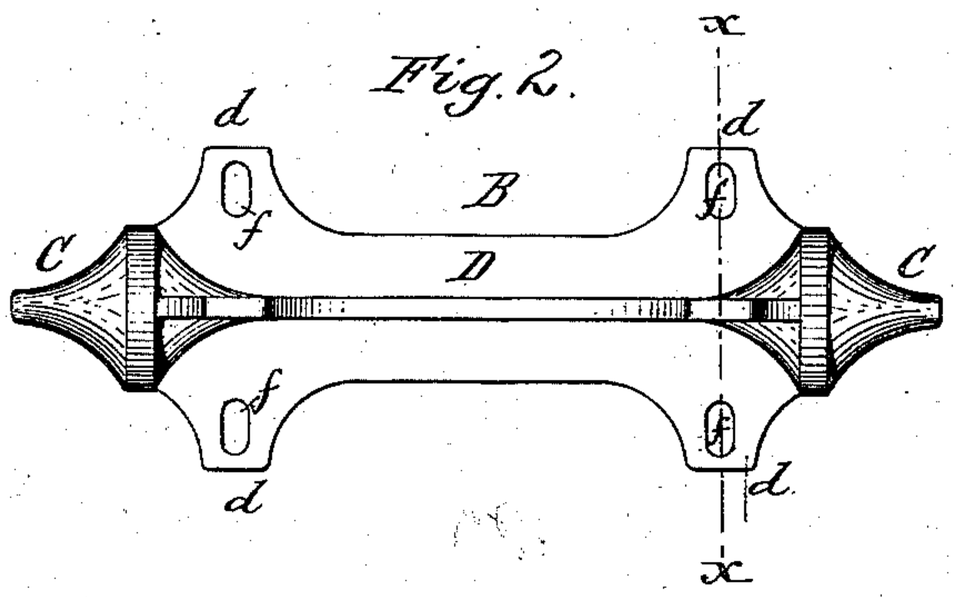


Fig. 3

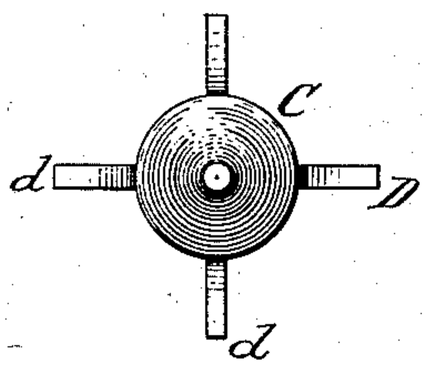
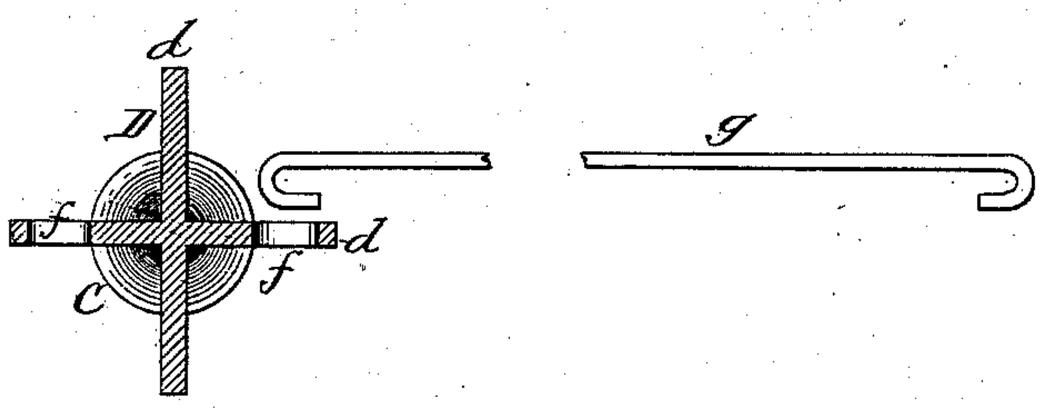


Fig. 4



Witnesses.

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UNITED STATES PATENT OFFICE.

CYRUS S. DEAN, OF CROWLAND, ONTARIO, CANADA, ASSIGNOR TO CHARLES H. VIBBARD AND NICHOLAS LANSING ZABRISKIE, OF AURORA, N. Y.

IMPROVEMENT IN FIRE-STOPS FOR STEAM-BOILER FLUES.

Specification forming part of Letters Patent No. **215,583,** dated May 20, 1879; application filed March 31, 1879.

To all whom it may concern:

Be it known that I, CYRUS S. DEAN, of Crowland, in the county of Welland, Province of Ontario, Canada, have invented a new and useful Improvement in Fire-Stops for Steam-Boiler Flues, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to that class of fire-stops for boiler flues or tubes which are made of less diameter than the flues and arranged within the flues in a series with intermediate spaces, whereby the flame and products of combustion are held or retarded in their passage through the flues and deflected against the inner walls of the flues, thereby enabling the flues to absorb and utilize a greater quantity of heat than is possible when the flues are unobstructed from end to end.

For a more particular description of these stops, reference is here made to Letters Patent of the United States No. 172,302, granted to me for such stops January 18, 1876.

My present invention has for its object to simplify the construction of said stops and enable the stops to be readily placed in the flues, and to be withdrawn therefrom when necessary.

My invention consists, to that end, of a flue-stop composed of two deflectors connected by longitudinal ribs; also, in providing the ribs of the stops with elongated openings adapted to receive the hooked end of the rod or bar by which the stops are connected.

In the accompanying drawings, Figure 1 is a sectional elevation of a boiler-flue provided with my improved stops. Fig. 2 is a side elevation on an enlarged scale of one of my improved stops. Fig. 3 is an end view thereof. Fig. 4 is a cross-section in line *x x*, Fig. 2, showing the connecting-bar in the proper position to hook into the elongated opening of the stop.

Like letters of reference refer to like parts in the several figures.

A represents the flue, and B represents my improved fire-stops arranged therein. The stops B are each composed of two conical deflectors, C C, connected by longitudinal ribs or plates D, which intersect each other and leave an open space between the deflectors. By this construction the stops are rendered light and strong, and the flame is permitted to freely play between the deflectors.

In the drawings, two plates, D D, are shown intersecting each other at right angles; but any desired number may be employed. The plates D are provided with projections *d*, fitting within the tubes or flues, so that when the stops are inserted therein the deflectors C will be held centrally within the flues. One or more of the plates D are provided with elongated openings *f*, arranged at right angles to the axis of the stops.

g represents the bars or rods by which the stops are connected and held at the proper distance apart. The ends of the bars *g* are bent over or formed in the shape of a hook, the bent portion being of such length as to pass easily through the elongated openings *f*, when the latter are arranged with their longest dimension in the line of the bent end of the bar.

The stops are placed in the flues one at a time, and connected by the hooked bars *g*, as shown in Fig. 1.

The deflectors C of the different stops are preferably made gradually increasing in diameter from the fire-box flue-sheet H toward the smoke-box, as clearly shown in Fig. 1, in order to compensate for the tendency of the heated gases to taper down or contract in the center of the flue as they approach the smoke-box.

When it is required to clean the flue, the stops B are readily withdrawn therefrom and disconnected.

My improved fire-stops are readily and cheaply constructed of cast-iron, and effect an important saving in fuel when the boiler is provided with a strong draft.

I claim as my invention—

1. A fire-stop for boiler-flues, composed of two conical deflectors, C C, and intersecting connecting-plates D, substantially as shown and described.

2. A fire-stop for boiler-flues, having projecting plates D, which are provided with elongated openings *f*, arranged at right angles to the axis of the stop, and adapted to receive the bent ends of the connecting bars or rods, substantially as set forth.

CYRUS S. DEAN.

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