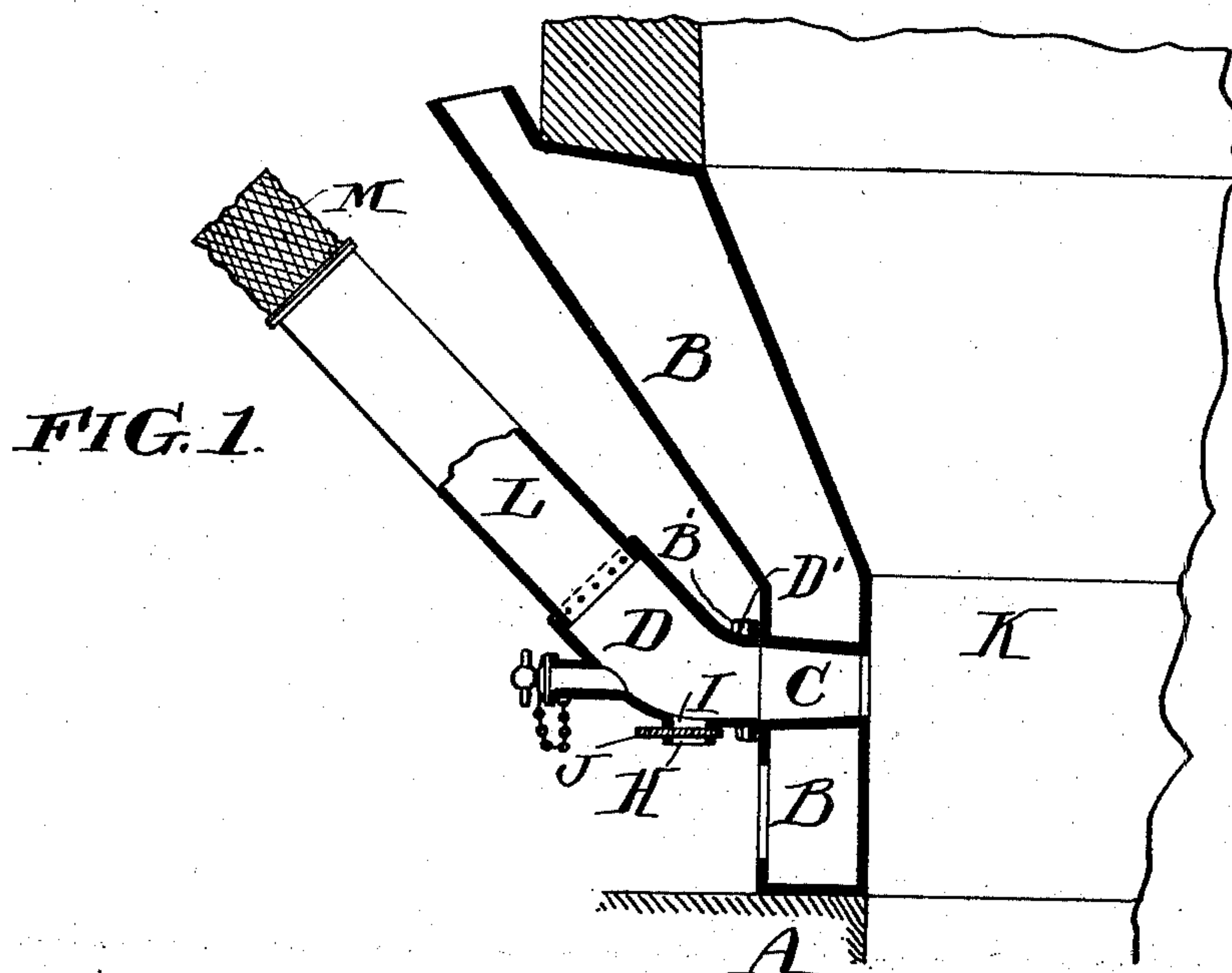


(No Model.)

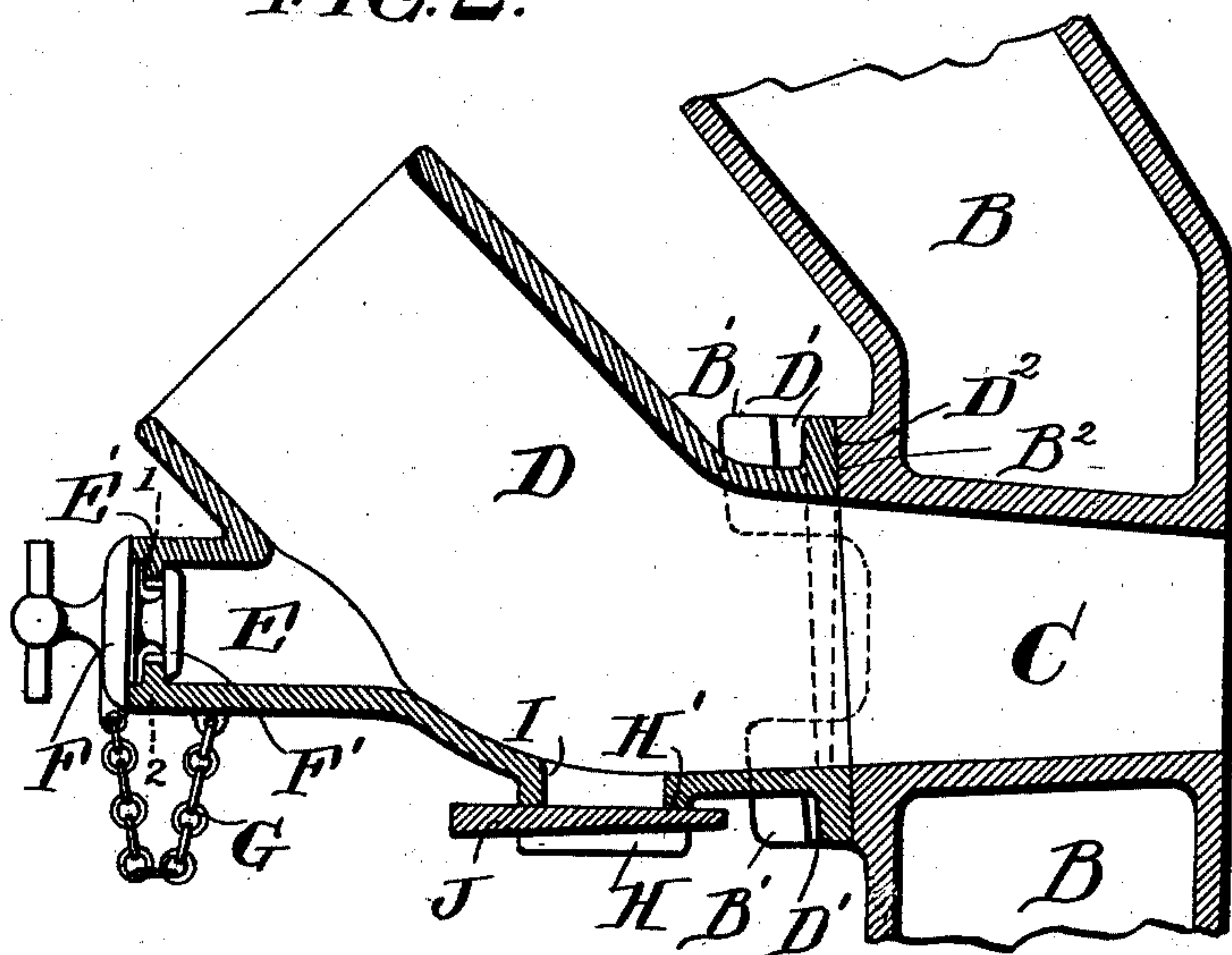
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TUYERE.

No. 505,549.

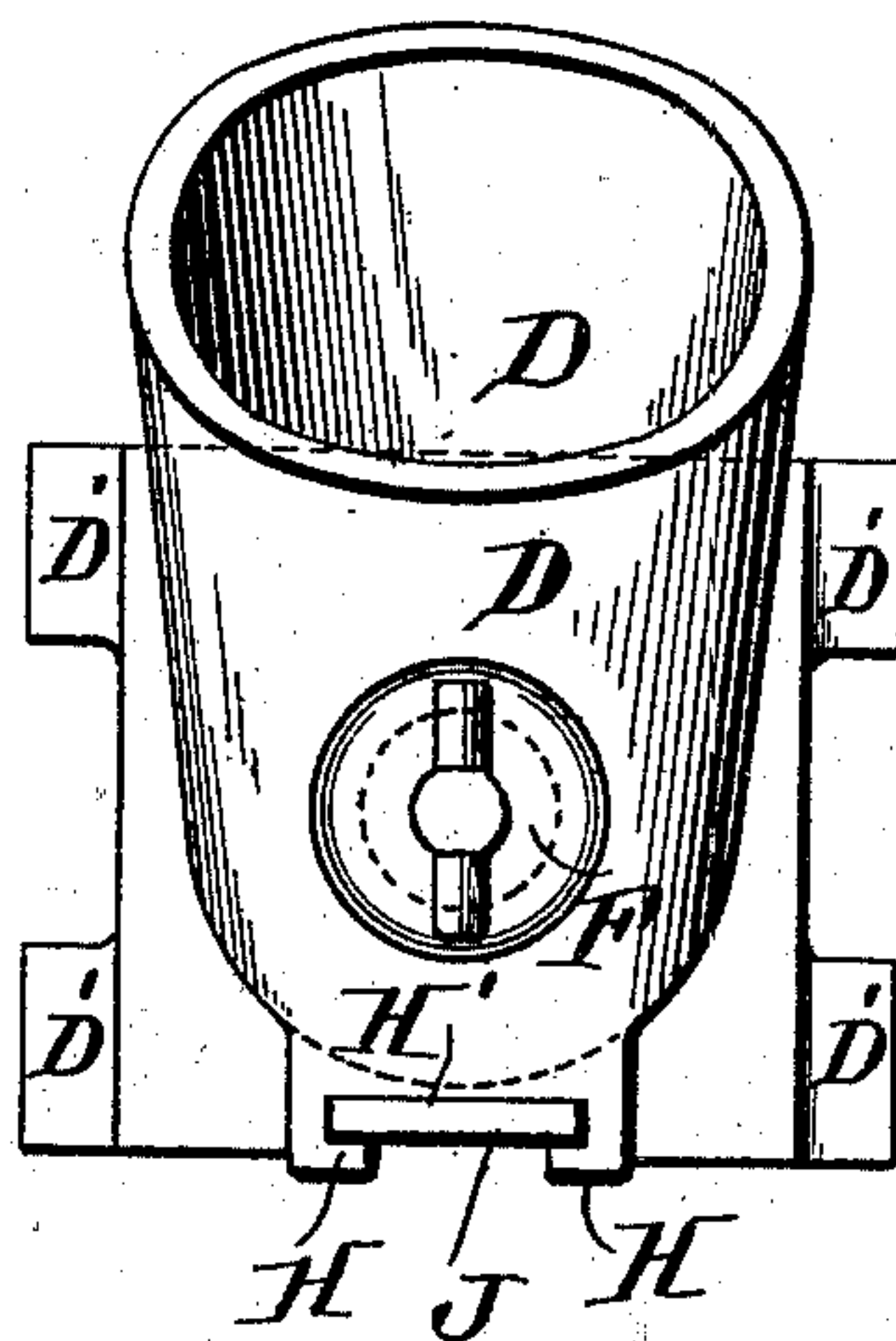
Patented Sept. 26, 1893.



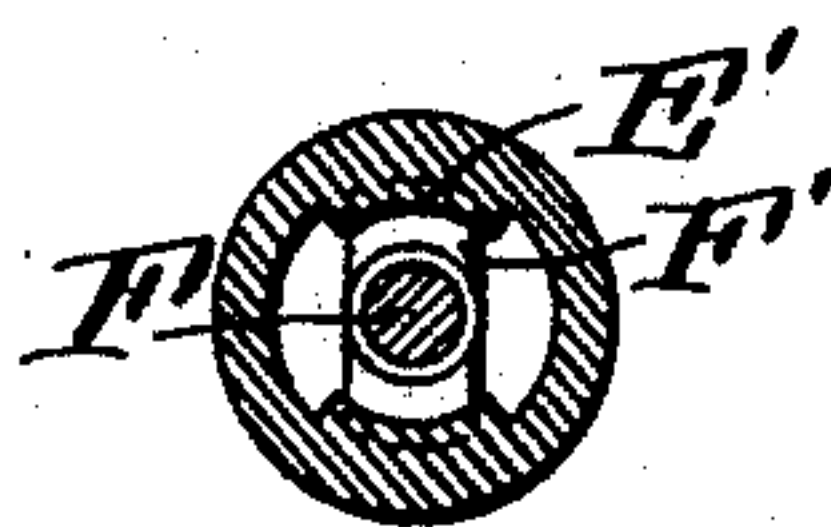
**FIG. 2.**



**FIG. 3.**



**FIG. 4.**



WITNESSES:

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*J. H. Russell*

INVENTOR:

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*by his atty.*

*Franco J. Chamber*



# UNITED STATES PATENT OFFICE.

MALVERN W. ILES, OF DENVER, COLORADO.

## TUYERE.

SPECIFICATION forming part of Letters Patent No. 505,549, dated September 26, 1893.

Application filed June 6, 1892. Serial No. 435,595. (No model.)

*To all whom it may concern:*

Be it known that I, MALVERN W. ILES, of Denver, county of Arapahoe, State of Colorado, have invented a certain new and useful  
5 Improved Tuyere, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to the construction of  
10 tuyeres for blast furnaces, having for its object to generally improve and simplify this device.

The nature of my invention will be best understood as described in connection with  
15 the drawings in which it is illustrated, and in which—

Figure 1 is a sectional elevation of my improved device showing the tuyere point and water jacket which, by my construction, forms  
20 a part of the tuyere. Fig. 2 is an enlarged longitudinal section showing the same parts; Fig. 3 a back view of the tuyere point, and Fig. 4 a view illustrating a detail of construction.

25 A indicates the crucible wall of the furnace K; B the water jacket which is cast with a passage C extending through it, which passage is tapered as shown and adapted to act as the mouth of the tuyere.

30 On the outside of the water jacket and on each side of the passage C are formed tapered lugs B'; that is to say, lugs which make an angle as shown, with the face B<sup>2</sup> formed around the outside of the passage C.

35 D is the tuyere point which is also made of cast metal and formed with a face D<sup>2</sup> adapted to fit against the face B<sup>2</sup> on the water jacket and with flanges D' which fit in between the lugs B' and the face B<sup>2</sup>. The opening through  
40 the tuyere point registers with the passage C when the tuyere point is inserted between the lugs D'.

E is an open tubular extension from the back of the tuyere point D arranged in line  
45 with the mouth of the tuyere and the passage C and provided with a cover plate F, the end of which is inserted in the groove E' at the

mouth of the tube E, and so formed that when twisted it will engage this flange and hold the cover securely in position.

G is a chain by which the cover F is secured to the bottom of the tube E as shown. 50

I is an opening formed in the bottom of the tuyere point D and below which are formed lugs H H inclined somewhat, as shown, to the  
55 face of the aperture I. The purpose of these lugs is to engage and hold under the opening I a tapered plate J made of some suitable material; as, for instance, a shingle, which will effectually prevent the escape of air  
60 while the tuyere is working properly, but which will be promptly burned and destroyed in case slag should enter the tuyere.

L in Fig. 1 indicates a wrought iron pipe section riveted to the end of the tuyere point D, 65 and M a canvas pipe secured to the sheet-iron pipe forming part of the air conduit to the tuyere.

Having now described my invention, what I claim as new, and desire to secure by Letters 70 Patent, is—

1. A tuyere having an opening I in its bottom, and lugs H provided with opposing recesses extending out beneath said opening substantially as and for the purpose specified. 75

2. The combination of a water jacket having a passage C extending through it, and lugs B' provided with opposing tapered recesses on its outer face, of a tuyere point D having tapered flanges adapted to fit in lugs 80 B' and a passage registering with passage C, substantially as specified.

3. A tuyere having an opening I in its bottom and lugs H provided with opposing recesses extending out beneath said openings 85 and a plate as J held by the lugs over the opening I and adapted to be destroyed at a temperature which will not affect the tuyere body, substantially as and for the purpose specified.

MALVERN W. ILES.

Witnesses:

JOHN S. WILLIAMS,  
JOHN M. WALKER.