

(No Model.)

2 Sheets—Sheet 1.

W. E. HILL.

TUBE AND METHOD OF MAKING THE SAME.

No. 414,643.

Patented Nov. 5, 1889.

Fig. 1.

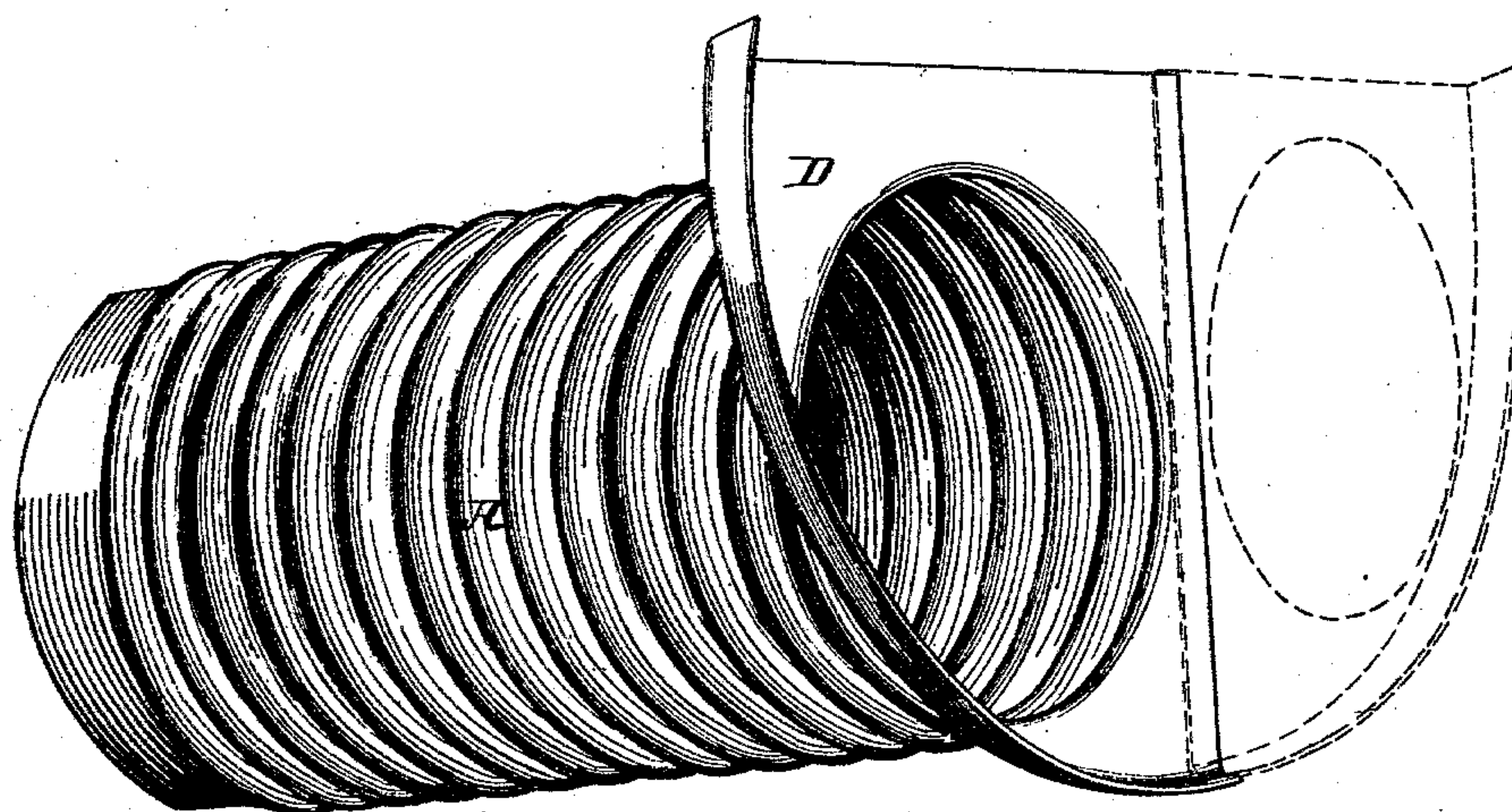


Fig. 2.

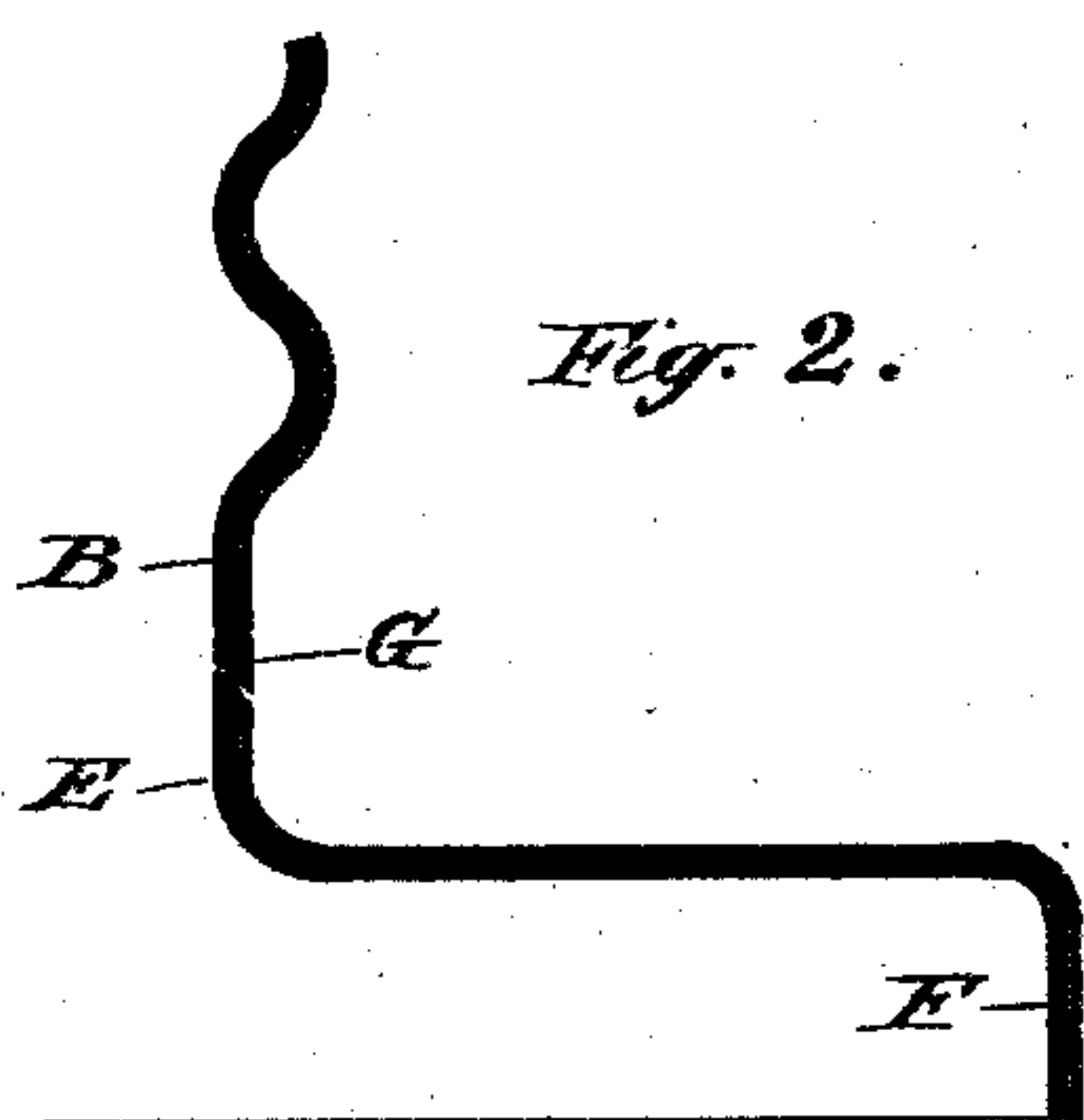
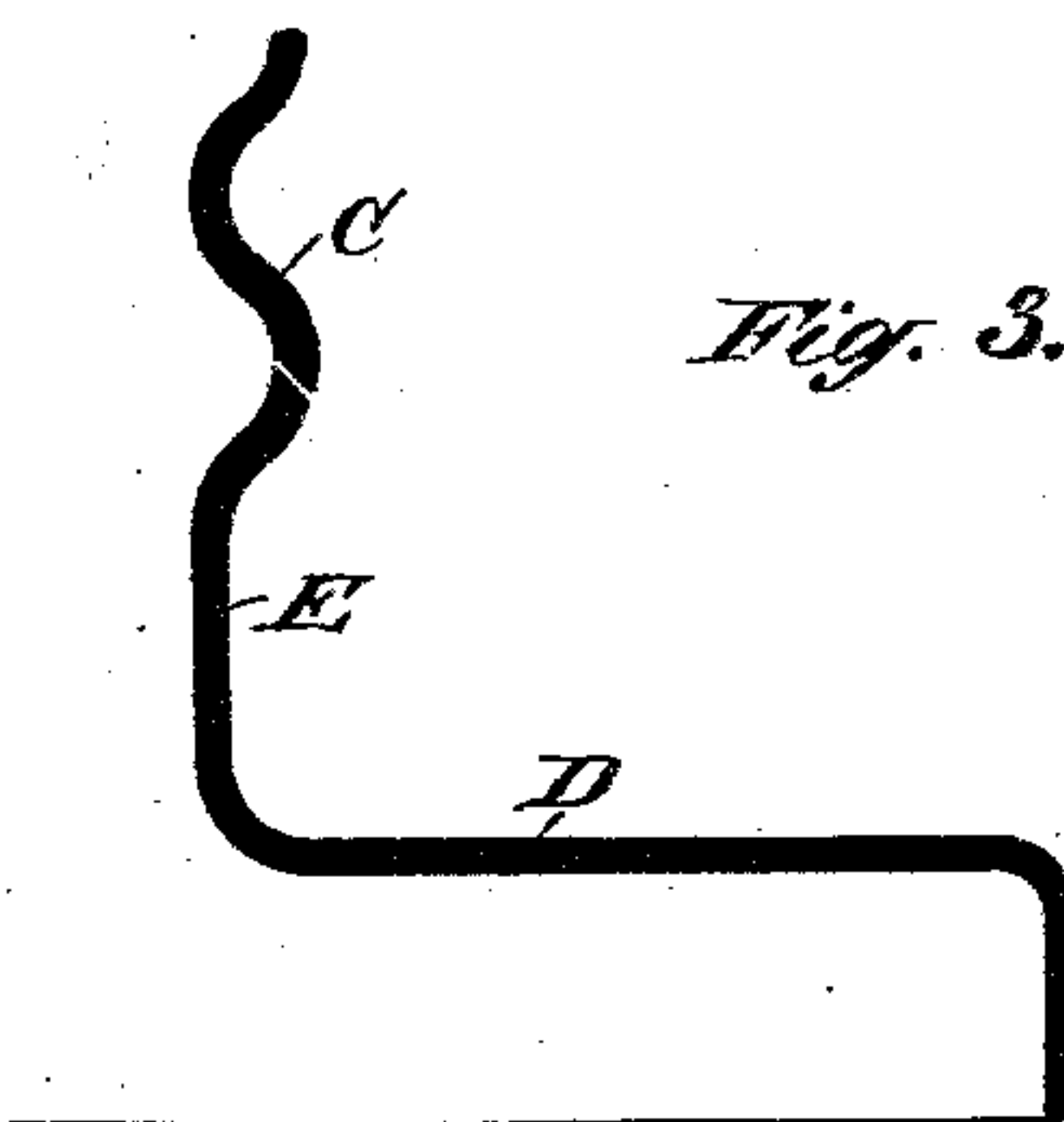


Fig. 3.



WITNESSES:

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Fig. 4.

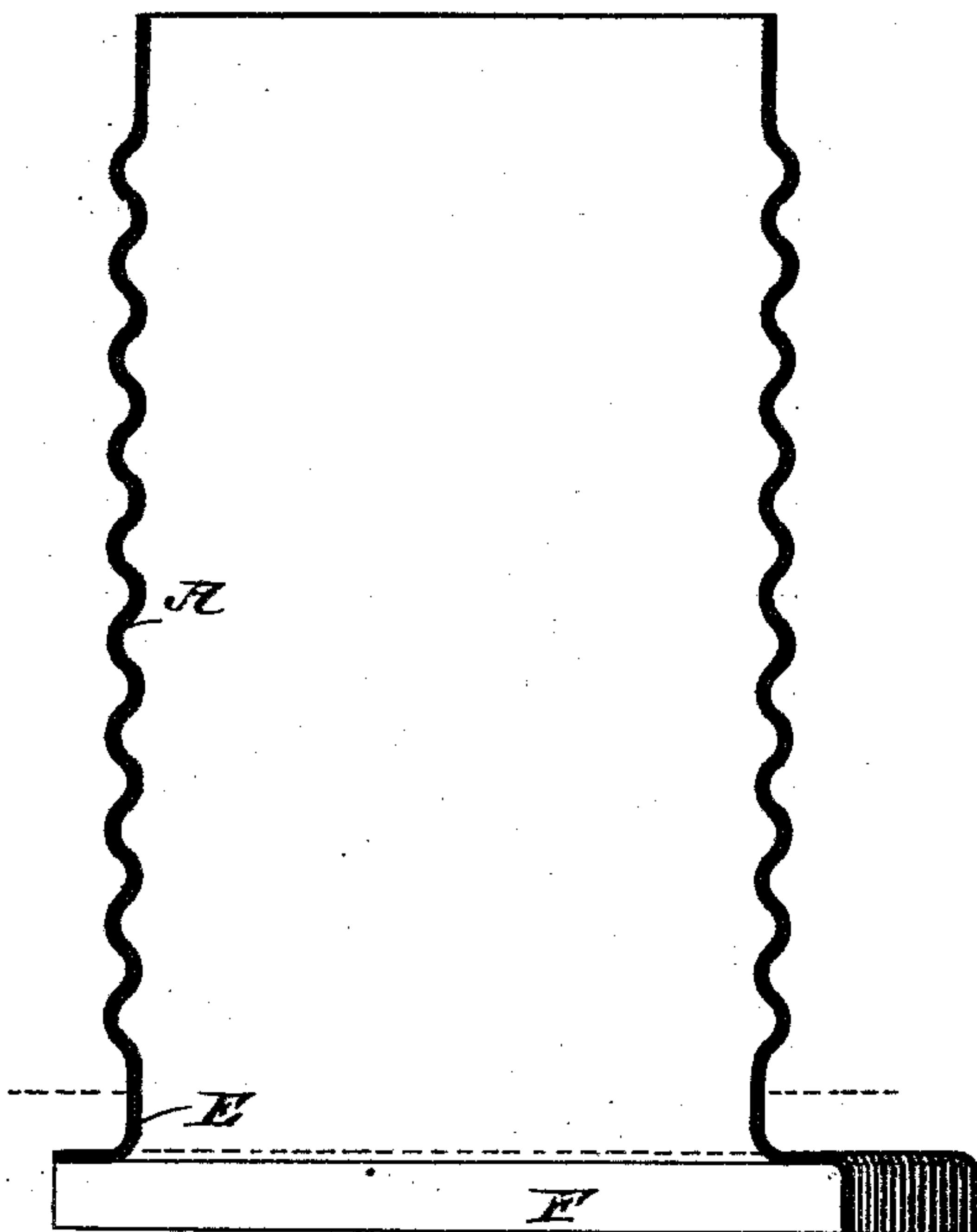
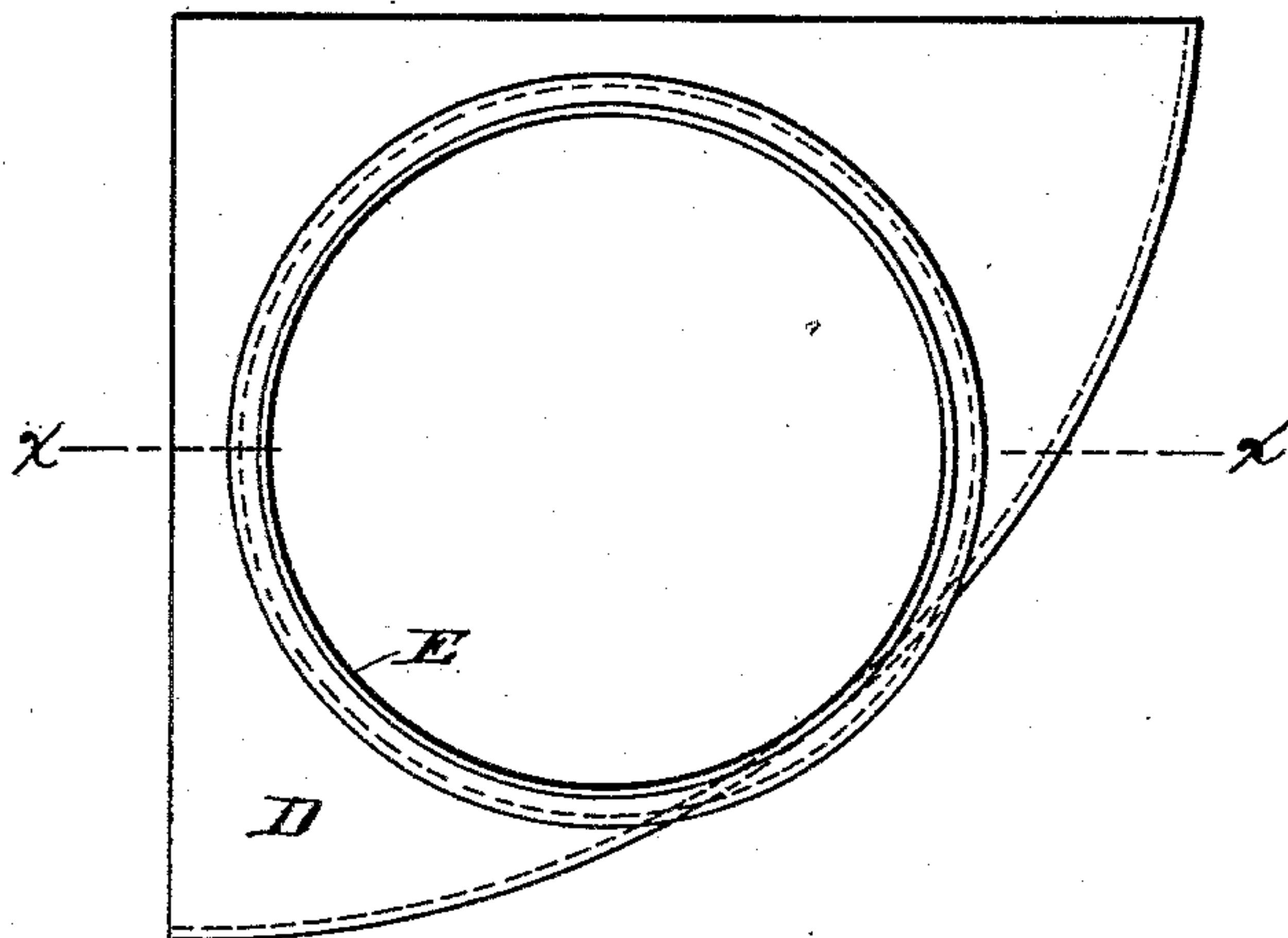


Fig. 5.



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UNITED STATES PATENT OFFICE.

WARREN E. HILL, OF BROOKLYN, ASSIGNOR TO THOMAS F. ROWLAND, OF
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TUBE AND METHOD OF MAKING THE SAME.

SPECIFICATION forming part of Letters Patent No. 414,643, dated November 5, 1889.

Application filed June 4, 1888. Serial No. 275,975. (No model.)

To all whom it may concern:

Be it known that I, WARREN E. HILL, of Brooklyn, in the county of Kings and State of New York, have invented certain new and
5 useful Improvements in Tubes and the Method of Making the Same, of which the following is a description, reference being had to the accompanying drawings.

This invention relates to the manufacture
10 of tubes or pipes having flanged or headed ends—that is, having laterally-projecting flanges at either or both ends by which the tubes may be joined together or secured in place in the structure in which they are used.

15 Such tubes are largely used as furnace shells or flues for steam-boilers, and I shall describe my invention as embodied in a corrugated furnace-flue, though it will be obvious that the invention includes other forms of
20 flanged tubes or pipes.

It is to be understood that in securing a flue or other like tube in a boiler structure flanges or like means must be formed between
25 the end of the tube and the boiler-plates by which to secure the tubes to the boiler. To this end it has been customary to forge or otherwise expand one end of the tube or flue into the form of a flange, which served as a means to rivet the flue to the boiler-plates or
30 to the front plate or plates of the furnace. It is obvious, however, that in thus forming a flange on the end of the flue the metal will be reduced in thickness, and this flanging can be practically done only for purposes where
35 a small or narrow flange will suffice. It is, however, desirable in many cases where flues or tubes and pipes are used to employ forms thereof having flanges much wider in lateral extent than would be possible to forge or ex-
40 pand from the body of the tube without reducing the stock to such an extent that the flange would not have the requisite strength compared with the body of the tube. Thus with boiler or furnace pipes it is desirable to
45 form integral with the body of the flue the head or plate that is to form a part of or is to connect it to the fire-chamber or boiler-shell.

My invention consists, therefore, first, of a
50 headed or flanged tube or flue composed of a cylindrical body, a plate forming the head or flange provided with a circular flanged open-

ing, the flange of said opening being welded to the end of the cylindrical body; secondly, the invention consists in the method of producing a headed or flanged tube or flue—
55 that is, in forming a circular flange around an opening in a plate adapted to serve as a head to the pipe and welding the flange of such opening to the end of the pipe.

In the drawings, Figure 1 is a perspective
60 view of a corrugated tube provided with one form of flange-head shaped and joined to the tube in conformity with my invention. Figs. 2 and 3 are detail sectional views illustrating the method of welding the head to the tube.
65 Fig. 4 is a central longitudinal section of the tube on plane xx of Fig. 5. Fig. 5 is a plan view of the structure of Fig. 4 unsectioned.

In these views, A represents the corrugated
70 tube. It is made by forming a sheet into cylindrical form and then circumferentially corrugating the same between suitable rolls. This tube may be finished with a plain end B, Fig. 2, or with a corrugated end C, Fig. 3.

D is the flange-head of the tube, this head
75 being usually the connecting plate or part of the structure to which the tube is to be attached. In the present instance the tube A is one of a pair of furnace-tubes which enter the combustion-chamber, the other flue and
80 its head being indicated by dotted lines, as seen in Fig. 1. The central portion of the head-plate D is first properly cut out so as to form an opening somewhat smaller than the diameter of the flue at its inner end, or the
85 end to which the head is to be attached. The edge of this opening is then bent up by pressing or forging at right angles to the body of the plate. Such flange is represented by letter E. In Fig. 1 it is shown as a plain flange.
90 In Fig. 2 it is shown as being shaped to form a part of the last corrugation of the flue. Another flange F may be formed on this head, if requisite, by which to secure the head to other parts of the combustion-chamber or
95 boiler. When the head has thus been prepared, it is then welded to the flue and thereby becomes an integral part thereof. The parts to be welded together may be scarfed, so as to partially overreach each other, there-
100 by producing a lap-weld, as seen at G, Fig. 2; but the particular method of welding is not

essential, as the head may be otherwise attached to the tube by various other forms of welds. The flanged or headed flue thus produced is a much stronger structure than
5 the flue heretofore produced and has the same lateral extent of flange or head, and it obviates all the objections incident to structures of similar shape, but having their parts riveted together.
10 I have hereinbefore described the invention as applied to a corrugated cylindrical flue or pipe; but I do not limit myself to such form of pipe, for these improvements are applicable to plain pipes and to pipes having
15 other forms in cross-section.

What is claimed as new is—

1. A headed flue or tube composed of a cylindrical body, and a flange plate or head having a circular flanged opening, the flange of the opening being welded to the end of the
20 cylindrical body, substantially as and for the purposes set forth.

2. The herein-described method of producing headed tubes or flues, consisting in forming a circular flange around an opening in a
25 plate and welding such flange to the end of a pipe-body, substantially as and for the purpose set forth.

WARREN E. HILL.

Witnesses:

ROBT. F. GAYLORD,
ROBT. P. HARLOW.