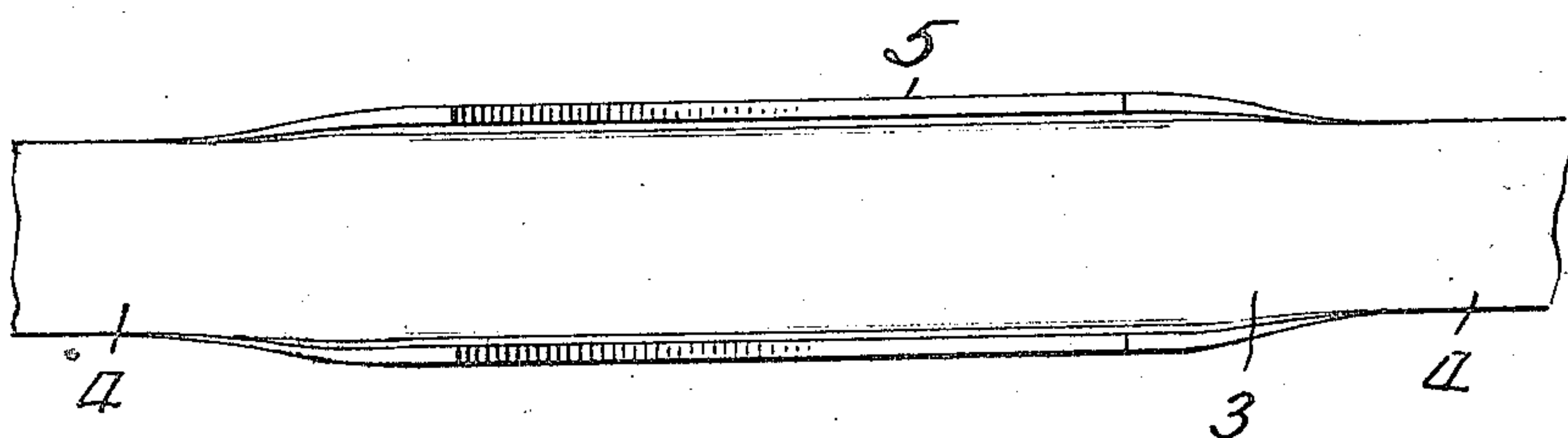
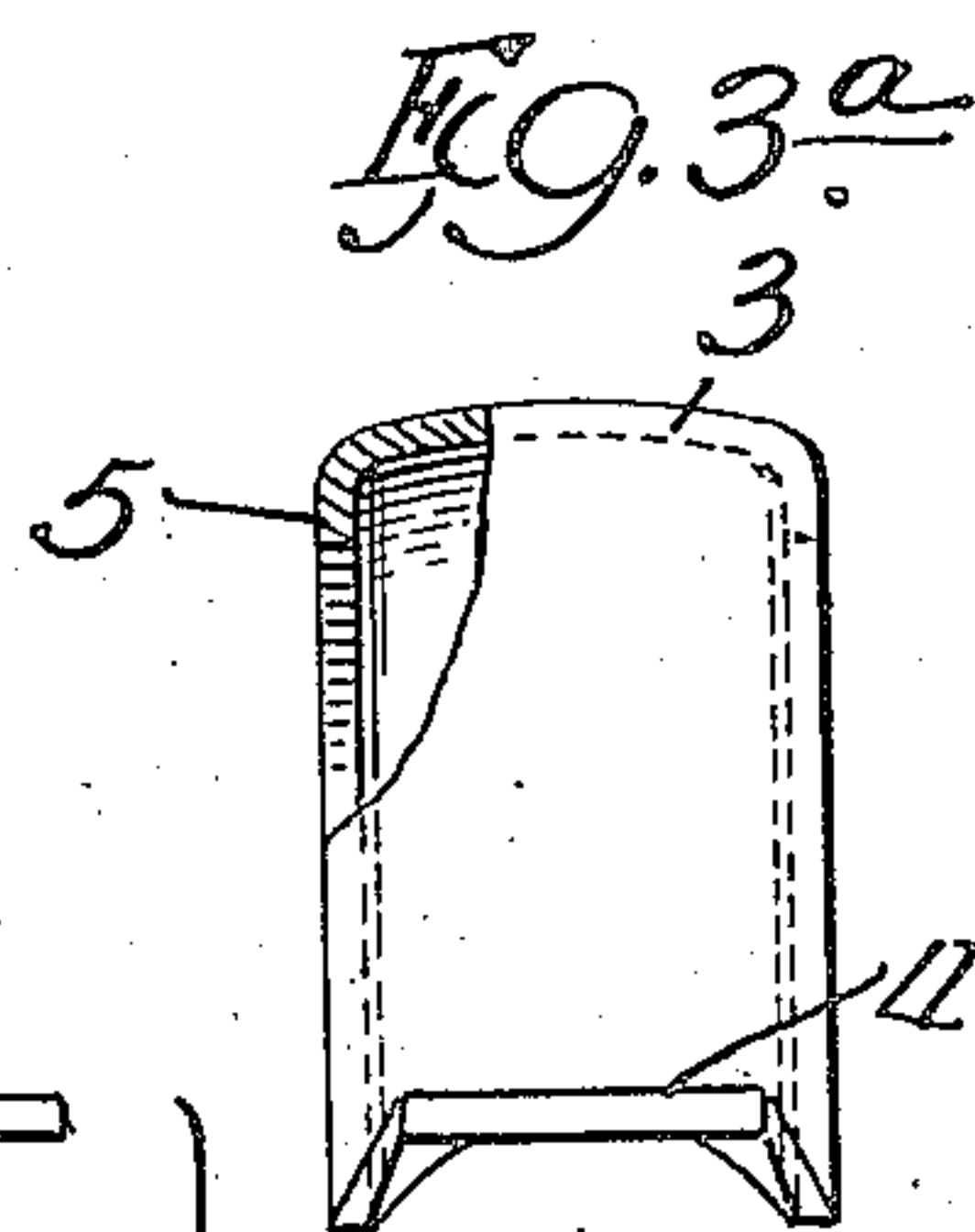
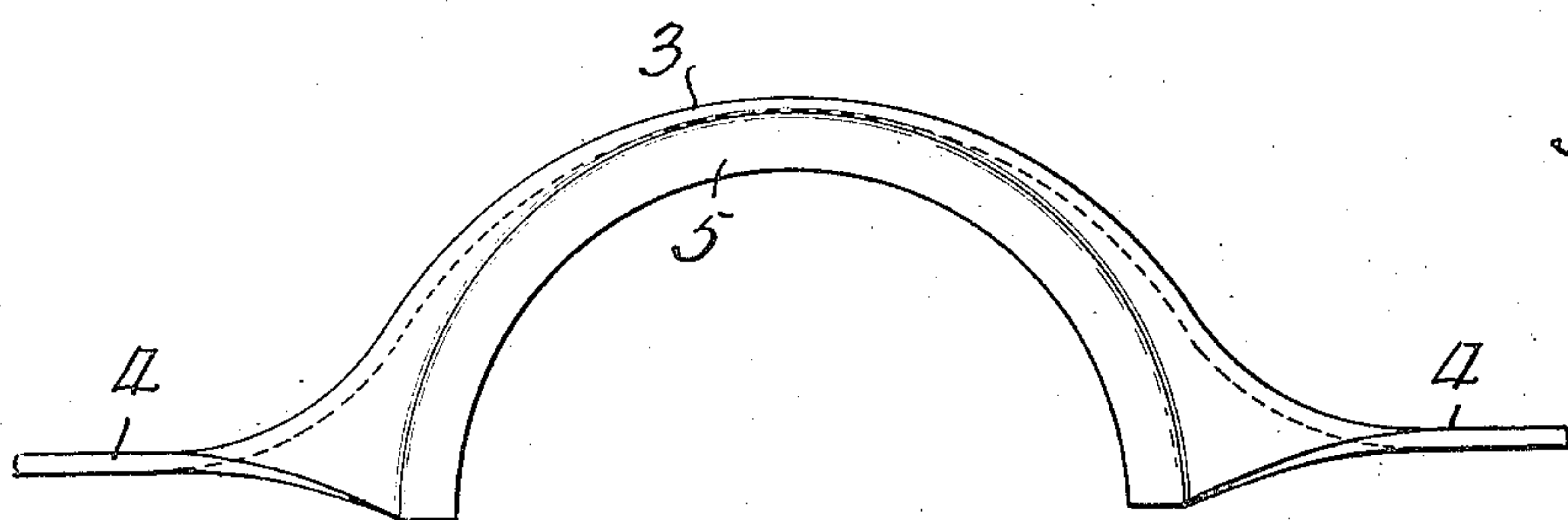
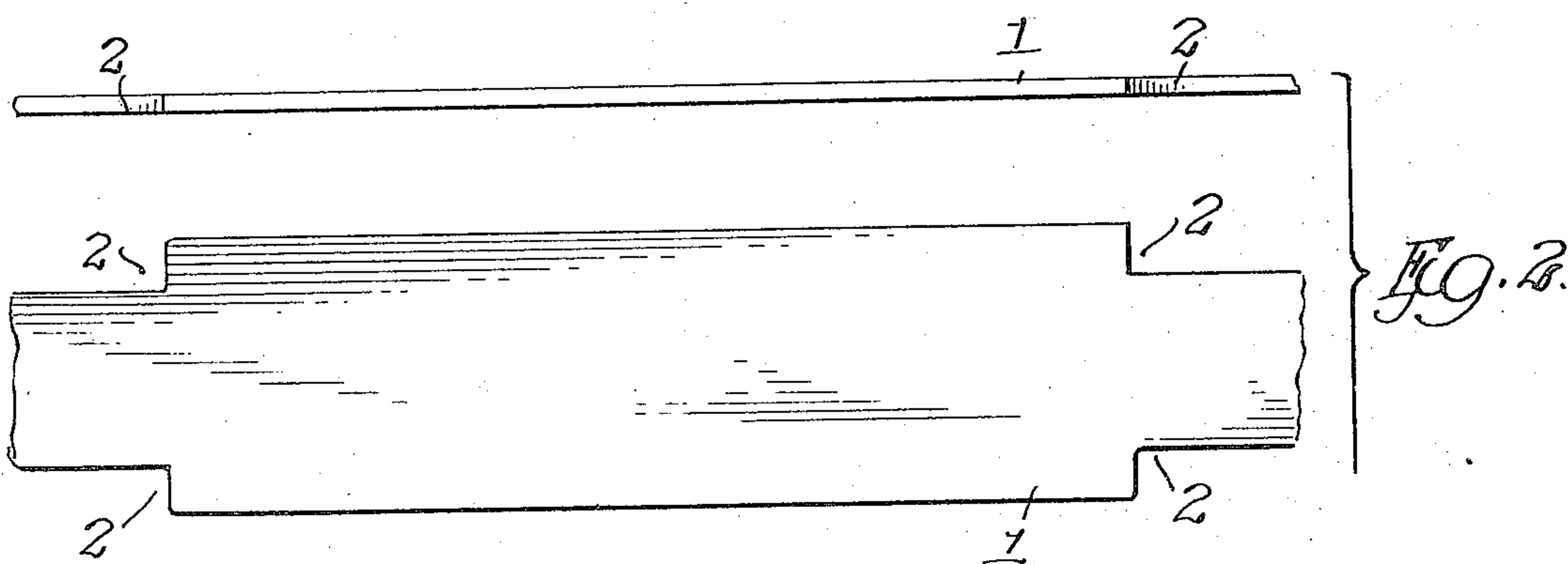
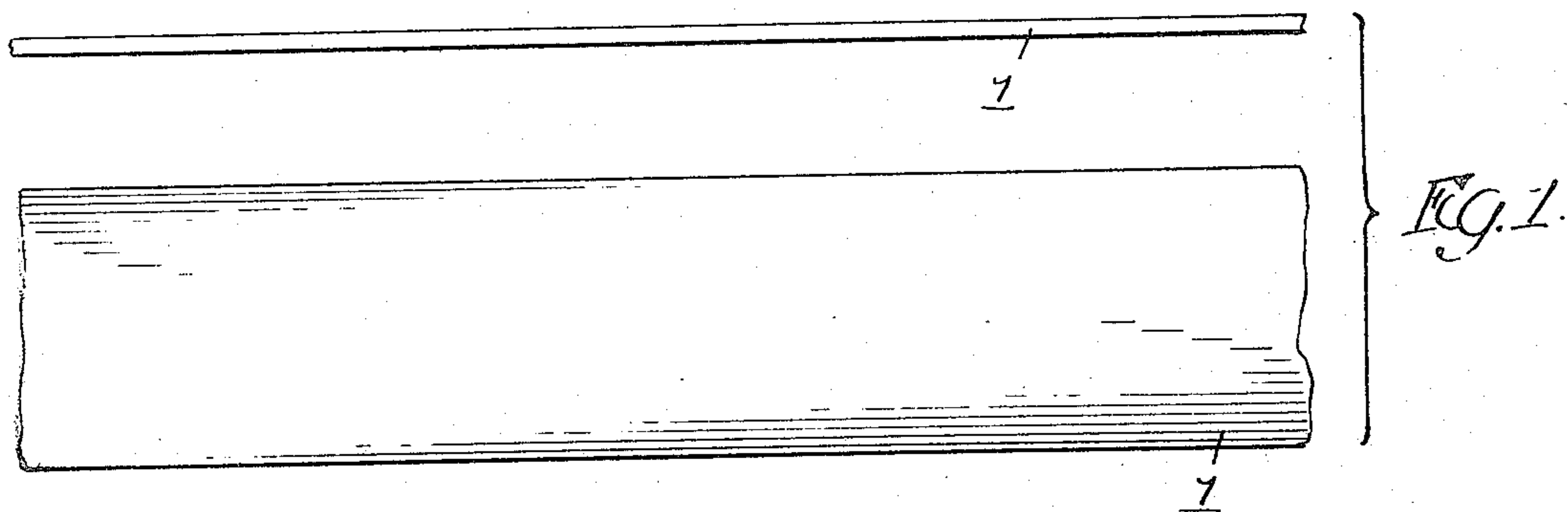


Jan. 2, 1923.

1,440,658

J. COAPMAN.
METHOD OF MAKING AXLE HOUSINGS.
FILED JAN. 29, 1921.

2 SHEETS-SHEET 1



Inventor

John Coapman

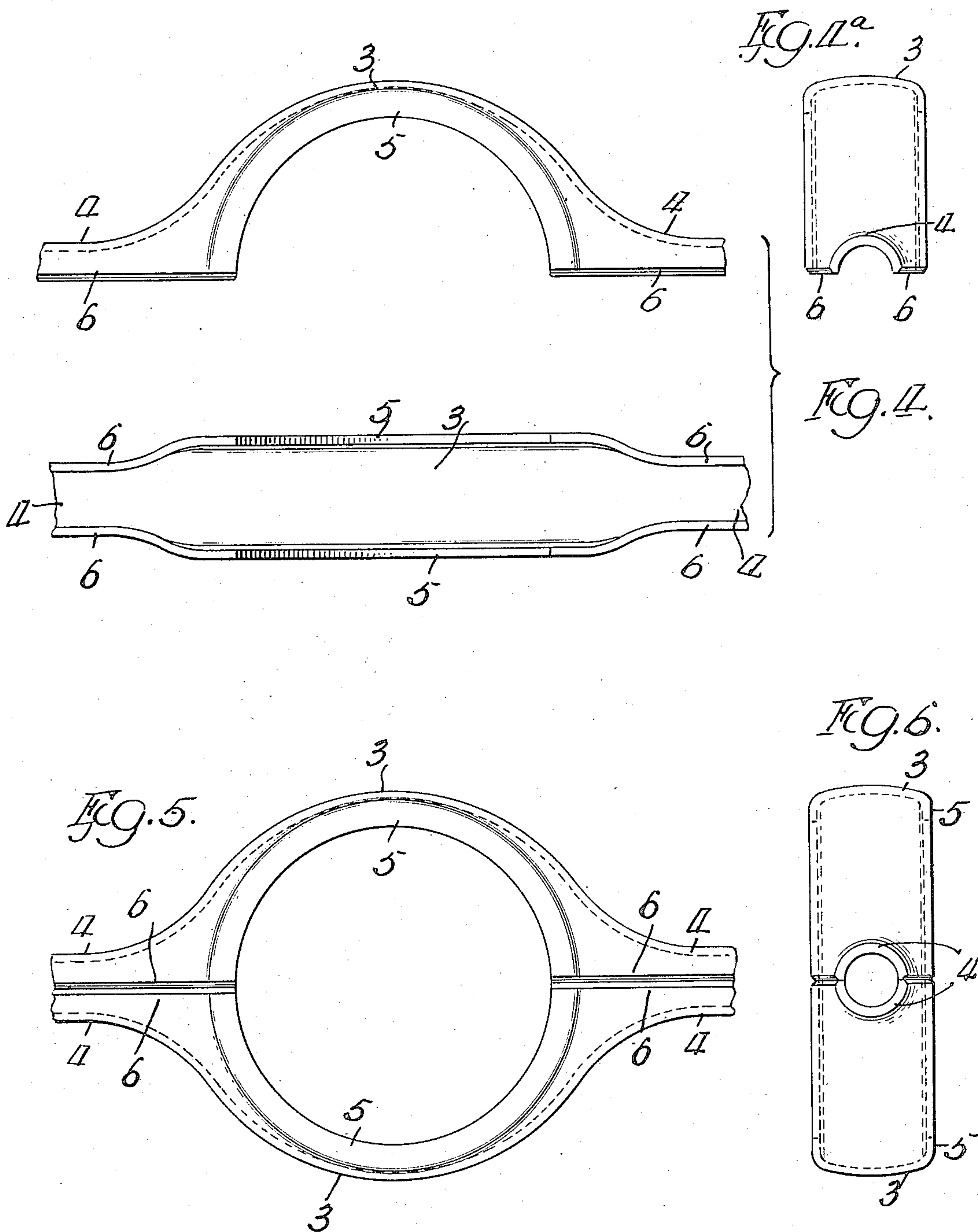
by Eugene E. Egan, Atty

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1,440,658

2 SHEETS-SHEET 2



Inventor
John Coapman
by Agnes Coapman Atty.

UNITED STATES PATENT OFFICE.

JOHN COAPMAN, OF DETROIT, MICHIGAN, ASSIGNOR TO RUSSEL MOTOR AXLE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

METHOD OF MAKING AXLE HOUSINGS.

Application filed January 29, 1921. Serial No. 440,834.

To all whom it may concern:

Be it known that I, JOHN COAPMAN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Methods of Making Axle Housings, of which the following is a specification.

This invention relates to a method of making axle housings for motor vehicles.

The practice heretofore has been to make axle housings by the cold drawn method. This required the use of rolled steel having a low carbon content, approximately .11 to .14 per cent, which permits pressing the steel while cold into the form desired for axle housings. This low carbon steel has much lower physical properties than a rolled steel containing a higher percentage of carbon, say .35 to .40 per cent. Such high carbon steel cannot be used in the cold drawing method, because it must be worked hot, thus not lending itself to the cold drawn method.

There is an advantage in using high carbon steel for axle housings because of its superior physical properties as compared with the low carbon steel, and it is the object of my invention to provide a method whereby high carbon steel may be used for axle housings, and, if desired, employing the same die equipment heretofore used in the cold drawing method.

In the accompanying drawings—

Fig. 1 is a side and plan view, respectively, of a portion of a flat bar of the required thickness and length and constituting the blank used for making, by the method of my invention, one half of an axle housing;

Fig. 2 is a side and plan view, respectively, of said blank after being notched on both sides at each end, in the first step of my method;

Fig. 3 is a side and plan view, respectively, of the blank after the mid-portion thereof has been forged to the shape shown, leaving the ends unformed, this being the next step of my method;

Fig. 3^a is an end view of the housing section while in the form shown in Fig. 3;

Fig. 4 is a side and plan view, respectively, of the section after its ends have been heated and forged in the next step of my method;

Fig. 4^a is an end view of the section in the form shown in Fig. 4; and

Figs. 5 and 6 are side and end views, re-

spectively, of the complete housing formed of two half sections, each made by the method of my invention and having their meeting edges fitted and welded together.

In forming an axle housing by my improved method, I make each half section thereof from a flat bar or blank 1 of high carbon steel, containing approximately .35 to .40 per cent of carbon. The bar or blank 1 is of the required length and thickness, and the first step of my method consists in forming notches 2 on both sides of the bar at each end, as shown in Fig. 2. These notches may be formed while the bar is either hot or cold and they reduce the width of the bar the required amount to permit the proper forming of the semi-cylindric ends of the section as the method progresses. After the notches 2 are formed, the next step consists in heating the bar by suitable means to the proper temperature, whereupon the heated bar is placed between the dies of a power press and the mid-section 3 of the blank forged to the shape shown in Fig. 3. This leaves the ends 4 of the section substantially flat and unformed, but the remaining portion of the section has the required semicircular shape with the side margins 5, 5 bent inward to make the section channel-shape throughout this curved mid-portion, as required and as shown in Figs. 3 and 3^a. The ends 4 are next re-heated and are forged by suitable means to make them substantially semi-cylindric in shape, as shown in Figs. 4 and 4^a. This brings the side margins 6 of the ends into alignment with the ends of the circular mid-portion 3 and completes the forming of the section. The next step consists in machining or otherwise finishing the edges of these flanges 6, and the complete housing is then made by taking two sections formed by the method described and putting them together, as shown in Fig. 5. The meeting edges of the flanges 6 of both sections fit and are welded or otherwise secured together to make a complete housing.

The method here described permits axle housings to be made from steel having a high carbon content, and thus enables the production of axle housings having physical properties superior to those heretofore made by the cold drawing practice. This high carbon steel may be blanked with the same blanking dies that are now used for low carbon steel, and by the system of re-heating,

as described, this steel may be forged into the shape desired by the use of the same die equipment as used for the cold drawing method.

5 I claim as my invention:

1. The method of forming a section of an axle housing from high carbon steel, consisting in, first, notching a flat blank of said steel on both sides at each end; second, heating the blank and forging it to the shape of substantially half of the axle housing, leaving the ends unformed; third, reheating the ends and forging them to give them a substantially semicylindric shape to fit over an axle section; and, fourth, machining the upper edges of the section.

15 2. The method of forming an axle housing from high carbon steel, consisting in

forming each half section of the housing as follows: first, notching the flat blank for 20 each section on both sides at each end; second, heating the blank and forging it to the shape of substantially half of the axle housing, leaving the ends unformed; third, reheating the ends and forging them to give 25 them a substantially semicylindric shape to fit over an axle section; fourth, machining to fit those edges of the sections which meet when the two sections are placed together; and, fifth, securing the two sections together 30 along their meeting edges by welding.

In testimony that I claim the foregoing as my invention, I affix my signature this 24th day of January, A. D. 1921.

J. COAPMAN.