

Oct. 7, 1930.

LEROY W. FRENCH

1,777,609

RAIN WATER FILTER

Filed Sept. 6, 1928

2 Sheets-Sheet 1

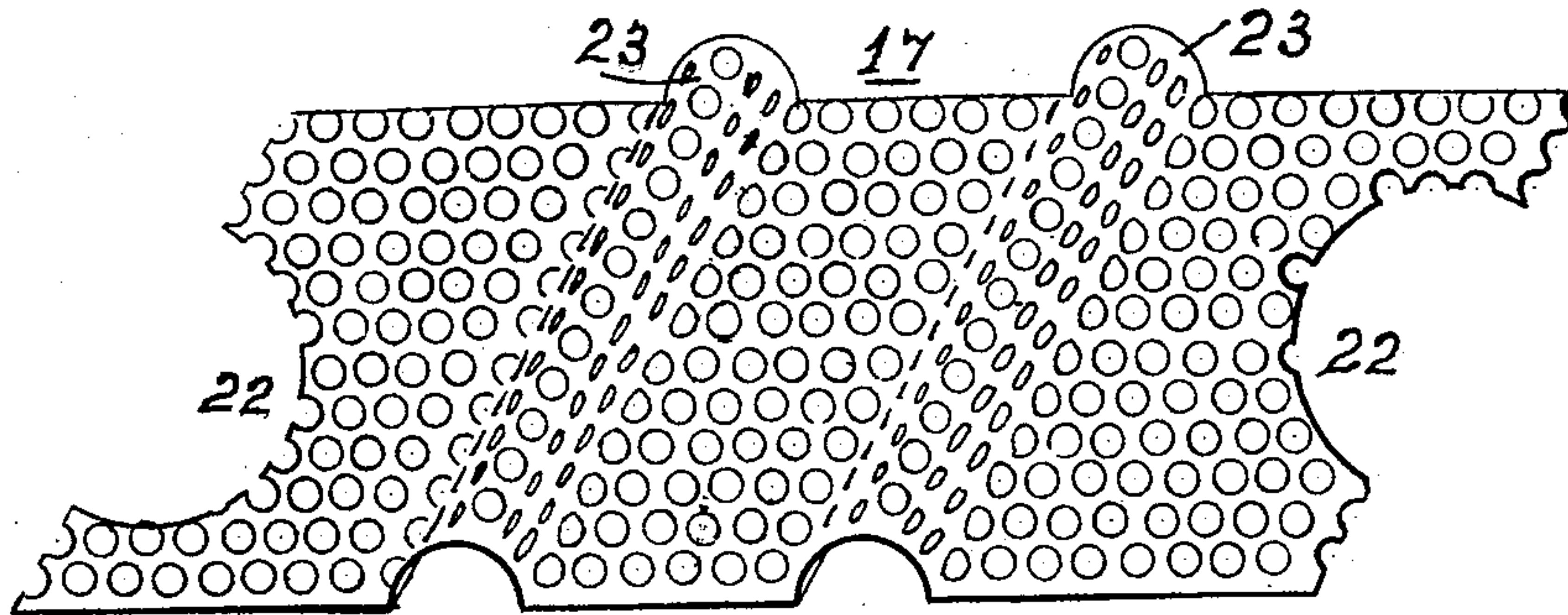


FIG. 3.

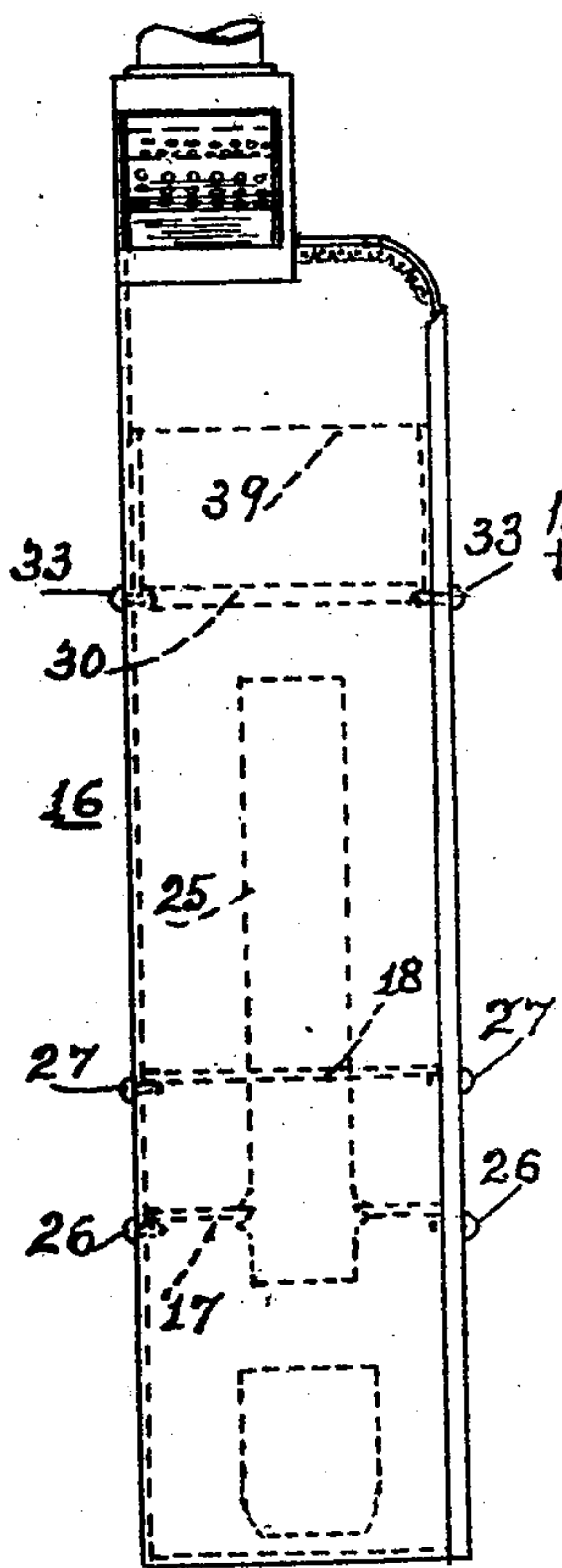


FIG. 2.

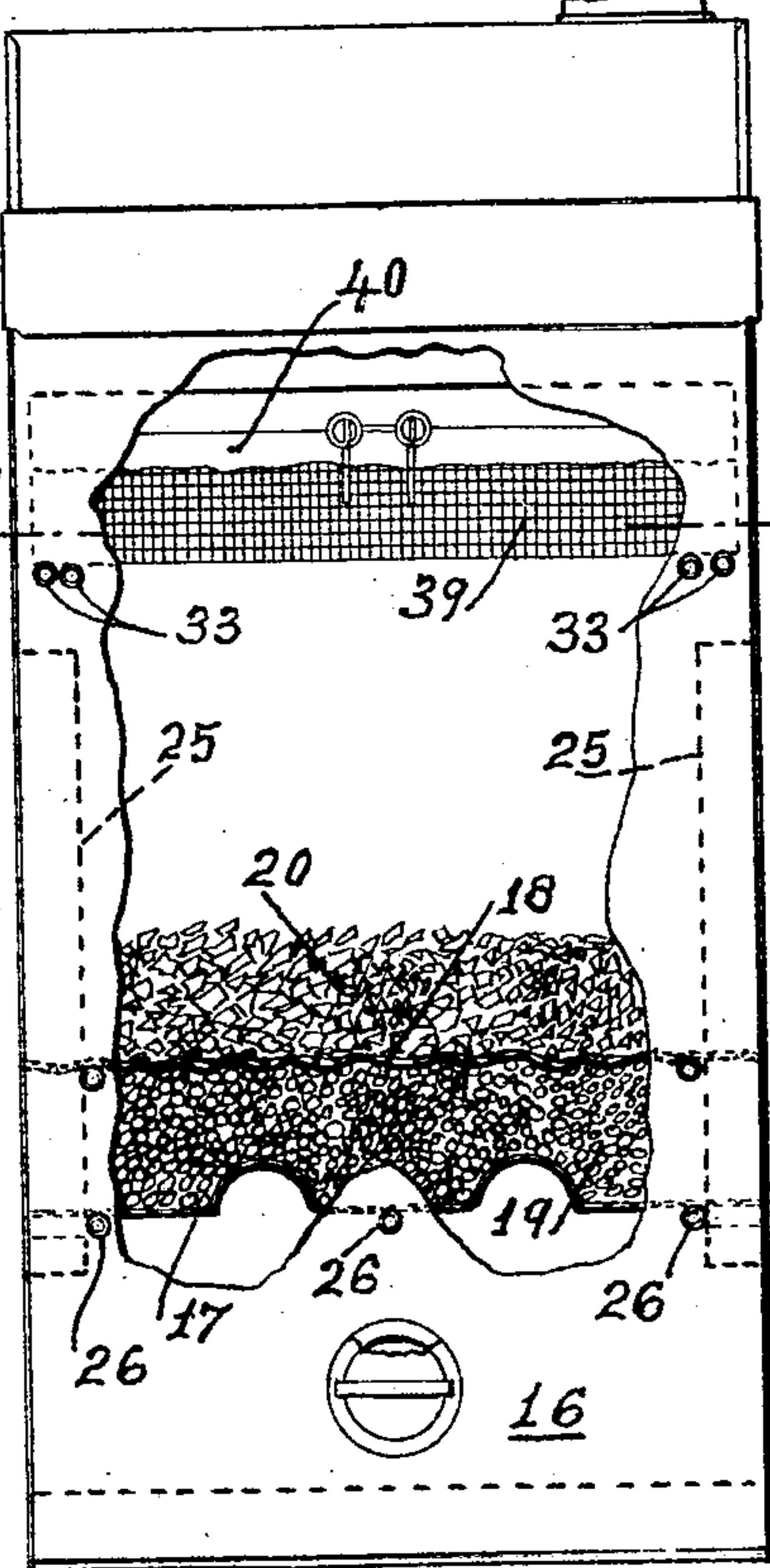


FIG. 1.

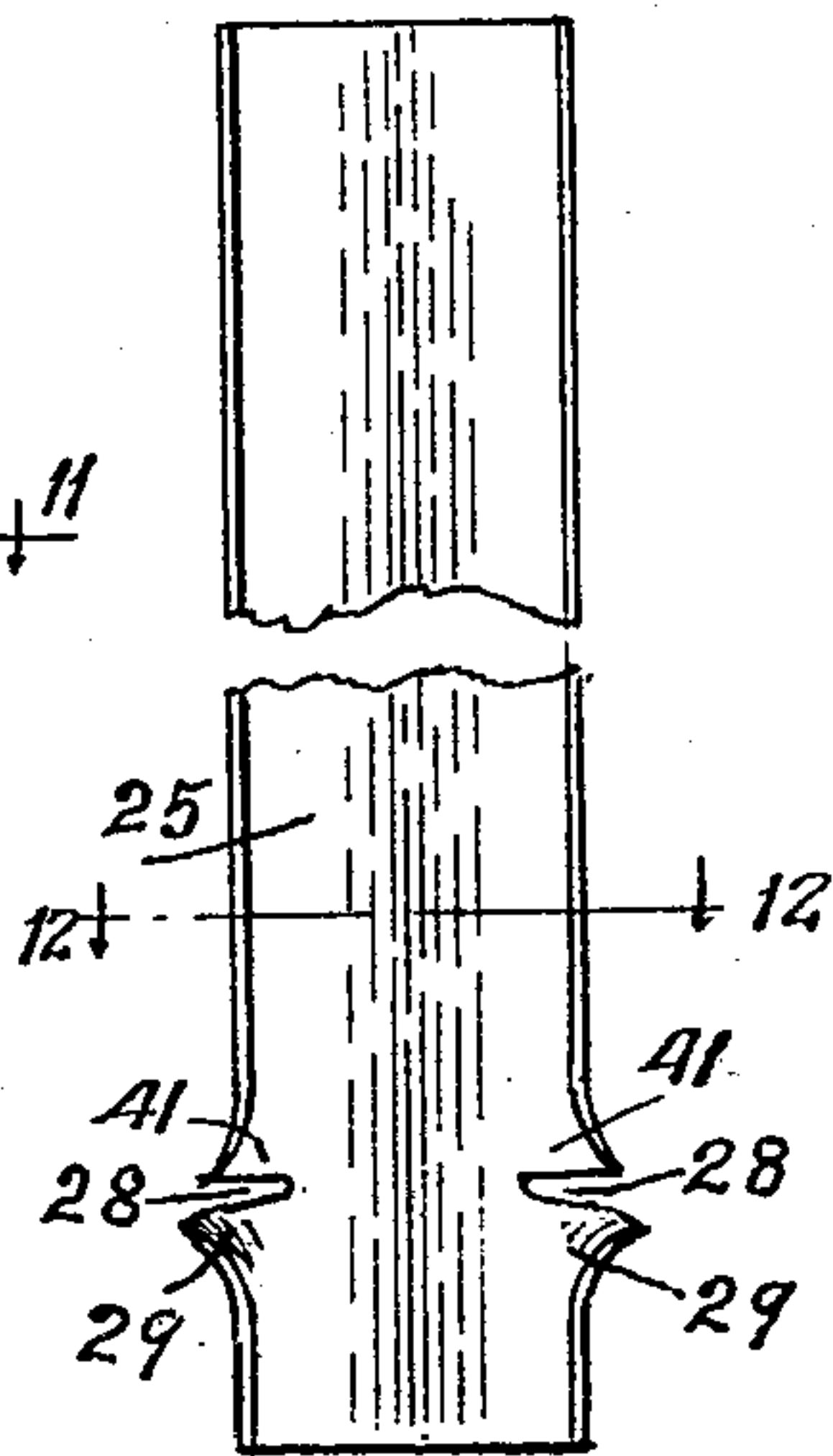


FIG. 8.

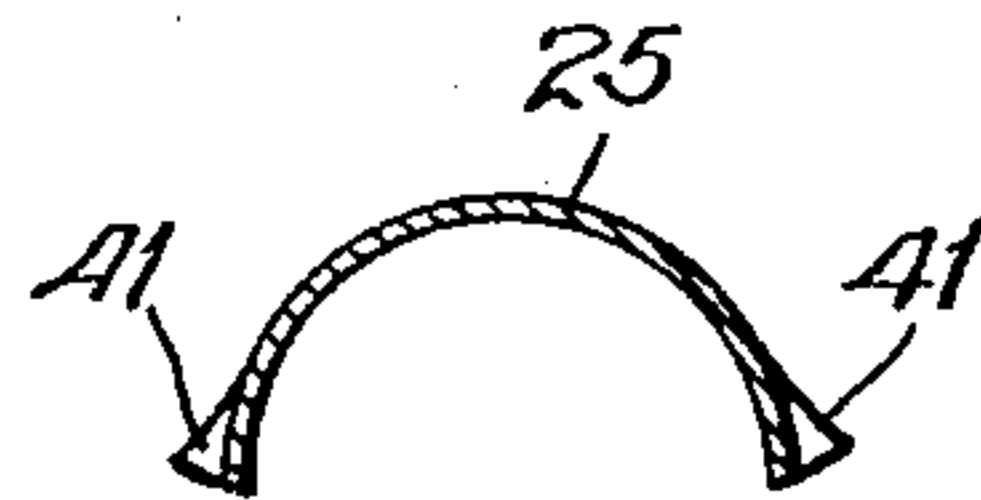


FIG. 12.

Witnesses.  
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2 Sheets-Sheet 2

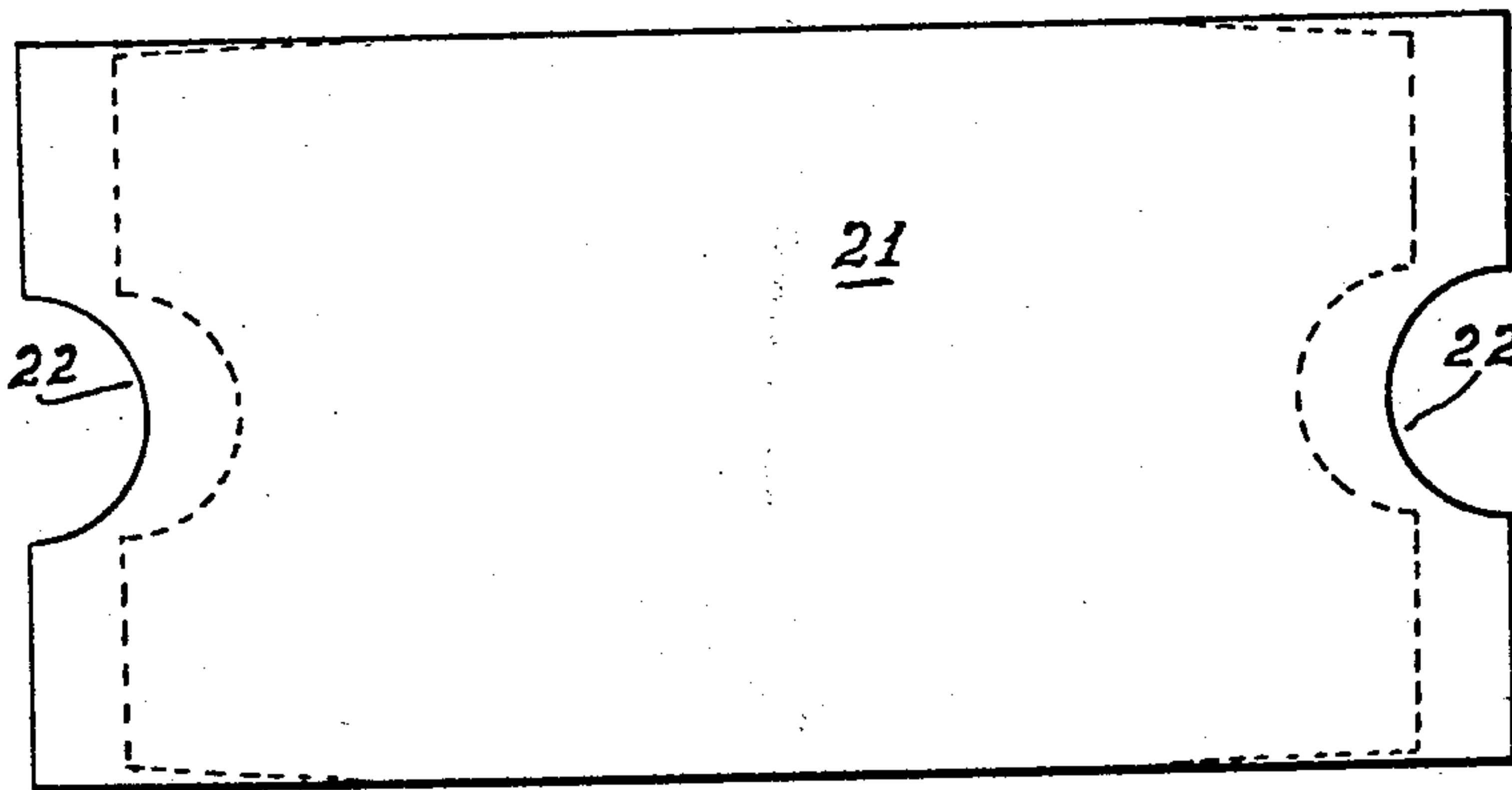


FIG. 4.

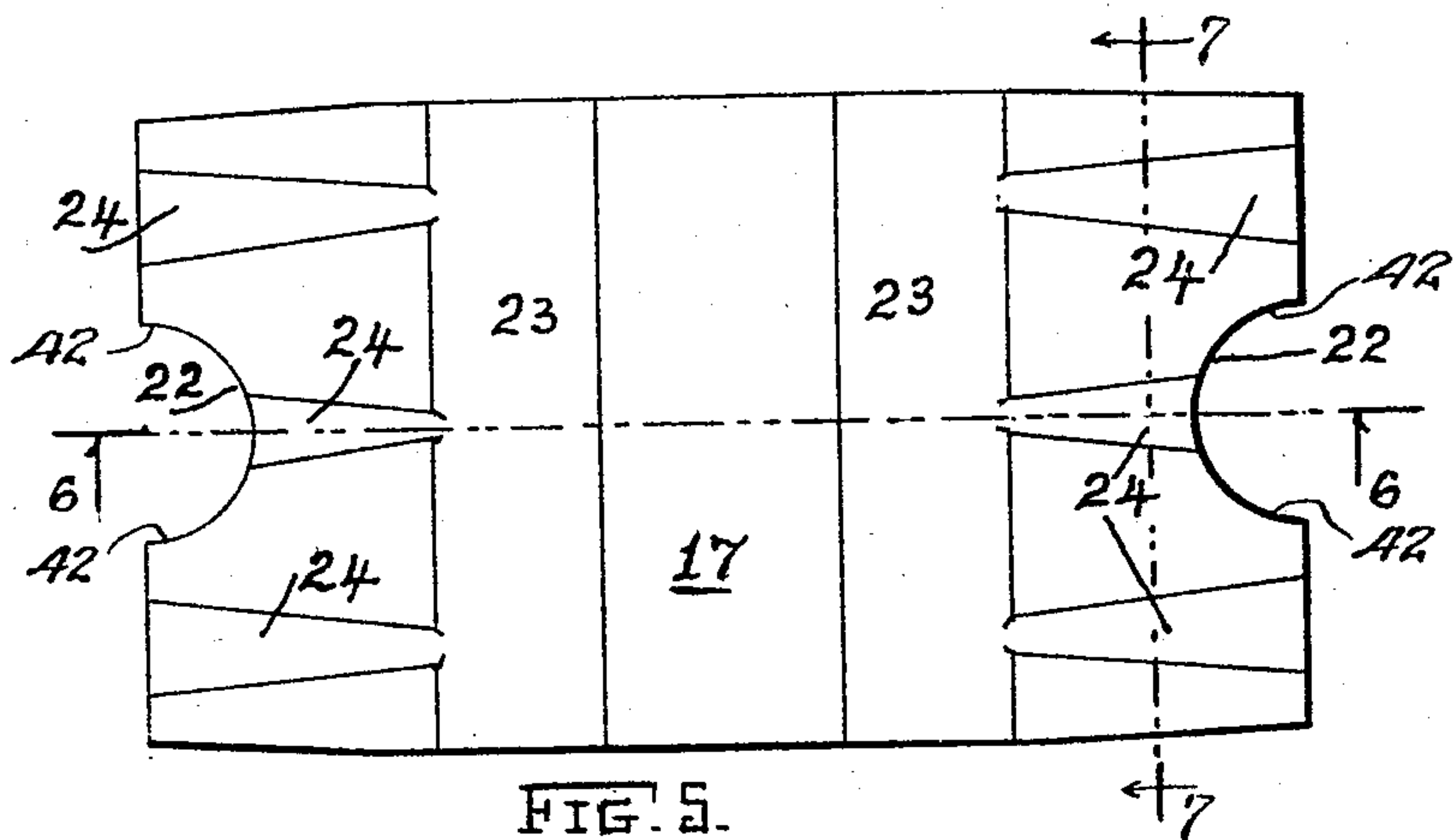


FIG. 5.

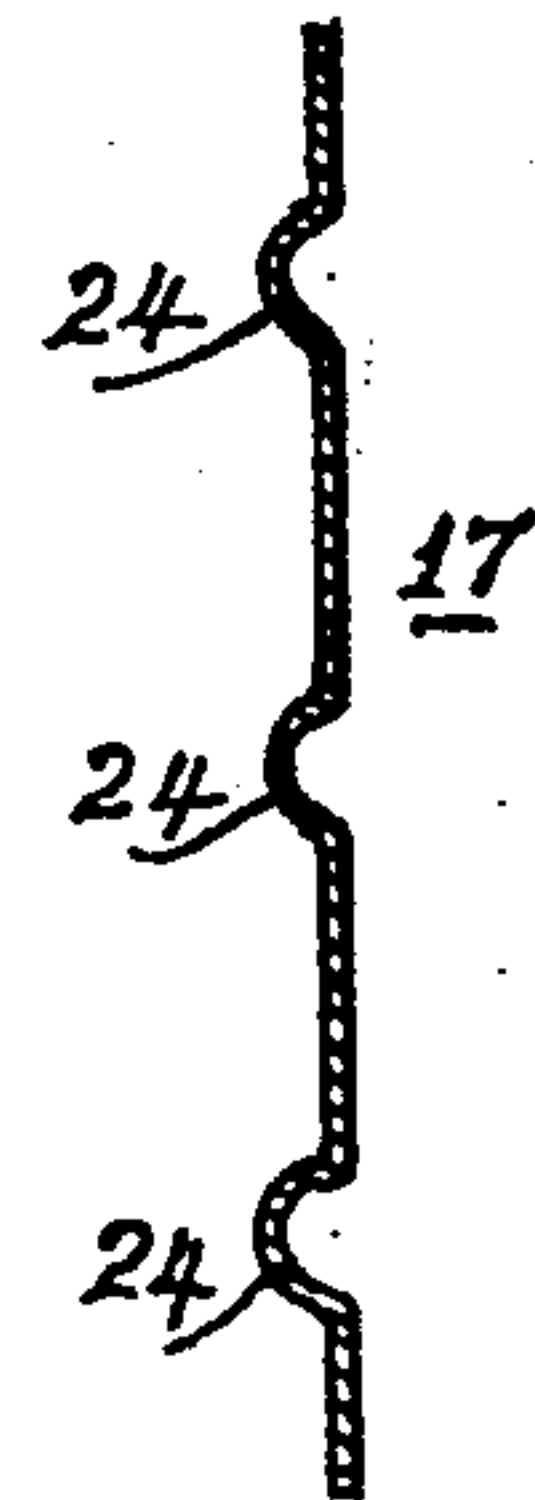


FIG. 7.

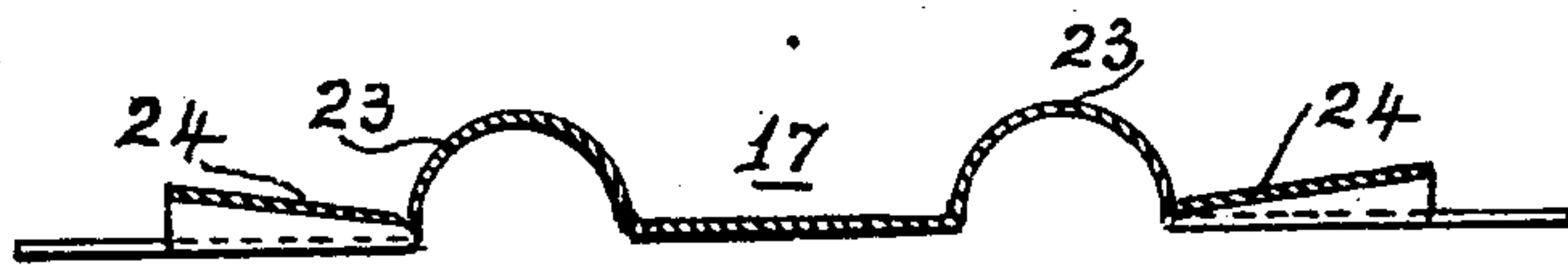


FIG. 6.

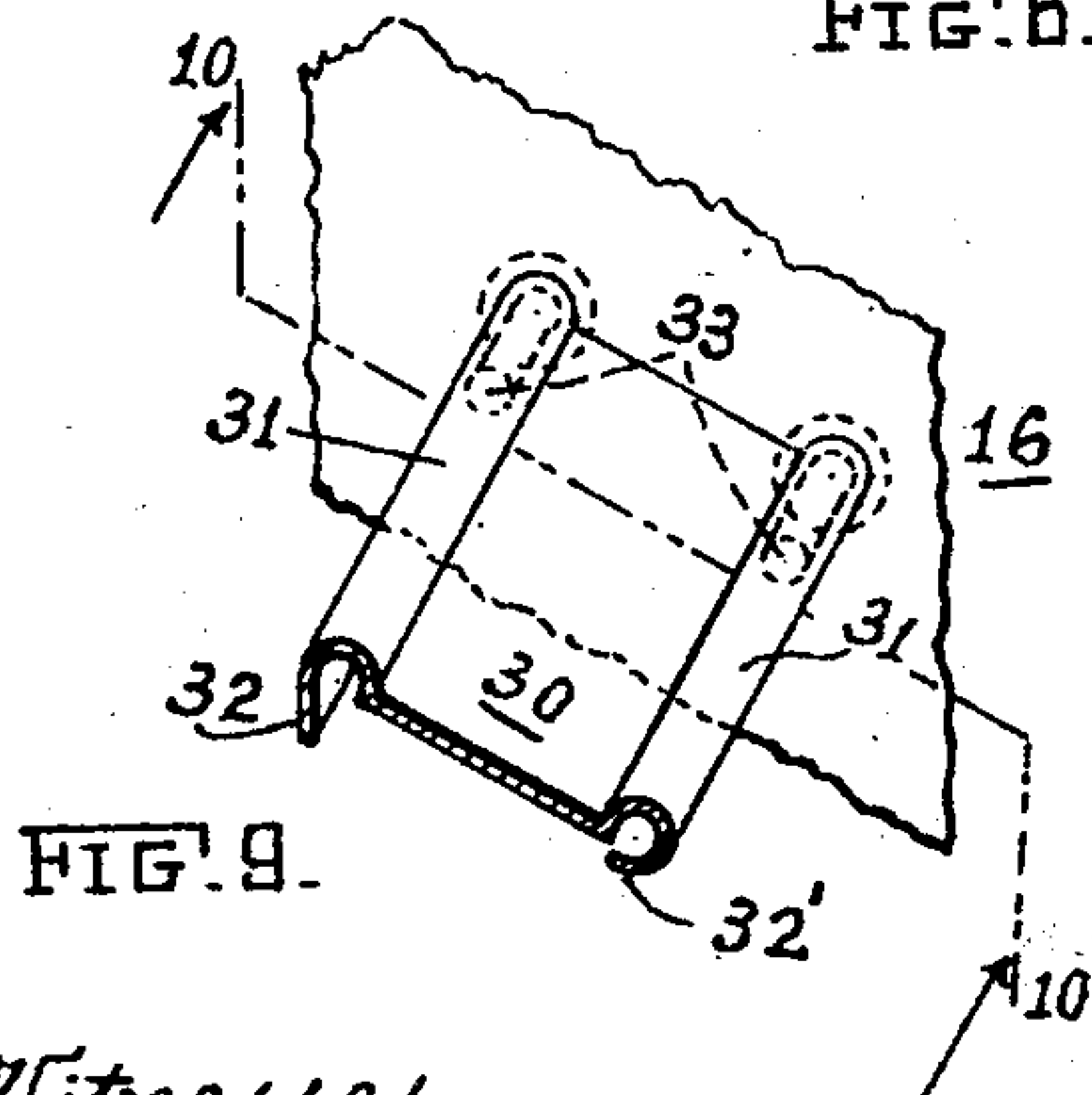


FIG. 9.

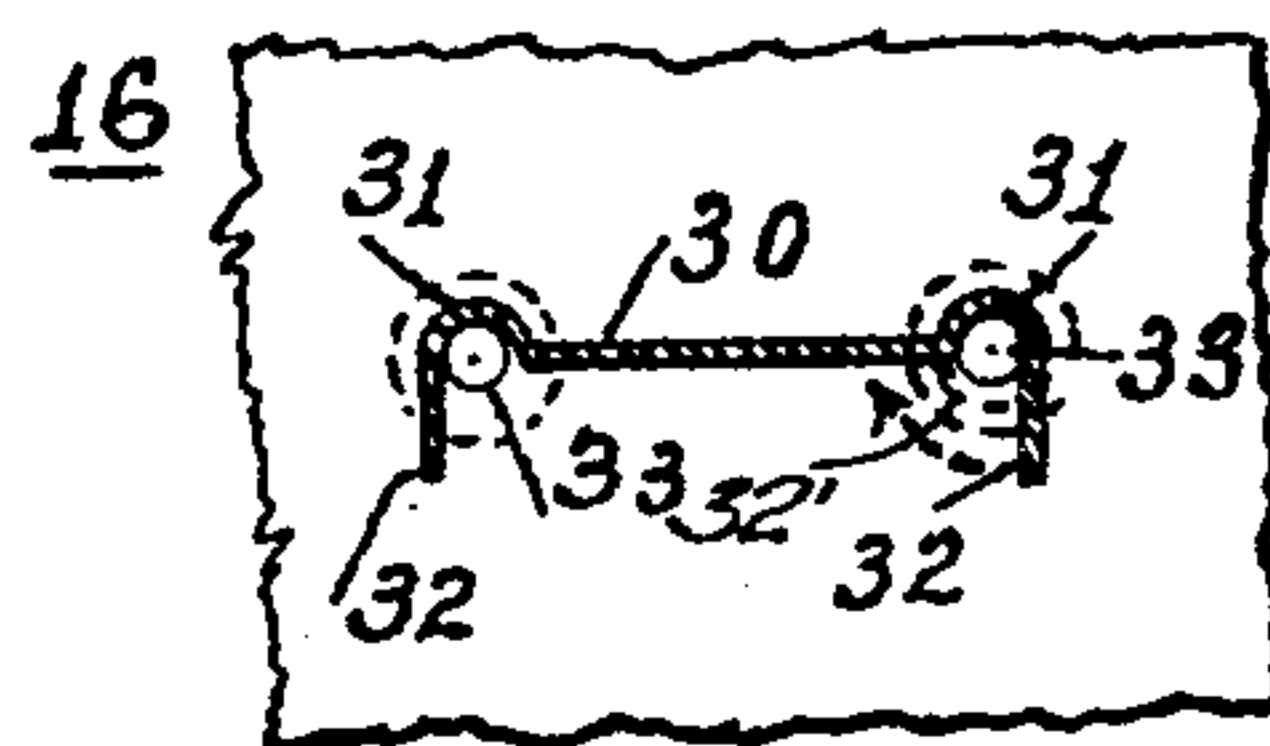


FIG. 10.

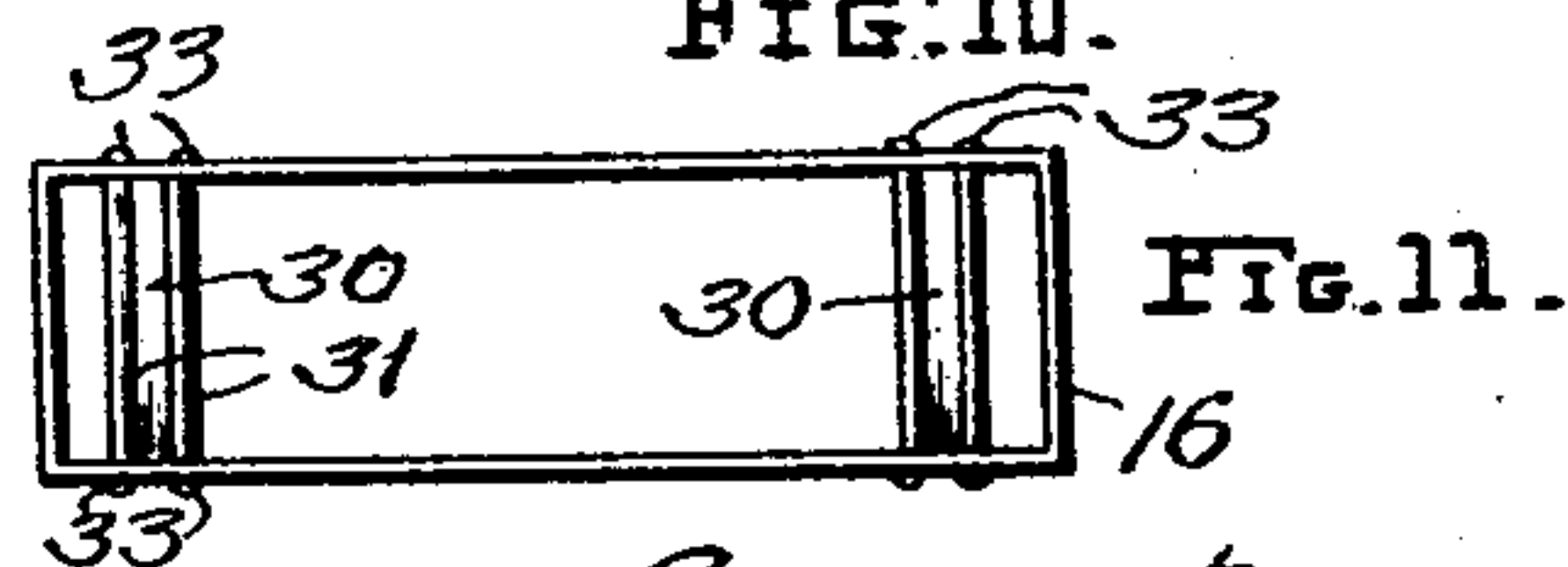


FIG. 11.

Witnesses.  
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Inventor.  
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## UNITED STATES PATENT OFFICE

LEROY W. FRENCH, OF BLOOMINGTON, ILLINOIS

## RAIN-WATER FILTER

Application filed September 6, 1928. Serial No. 304,306.

The present invention is a modification and improvement of the invention set forth in U. S. Patent #986,161 granted to me March 7, 1911.

5 The present invention is illustrated in the accompanying drawings to which reference is hereby made.

The general purpose of the invention is to provide improved details of structure, such that all the principal elements of the structure may be made of sheet metal formed to withstand unusual pressure within the casing and to strengthen the structure generally with the result that the structure as a whole is simplified and strengthened.

Referring to the drawings, Fig. 1 is a front elevation of a rain water filter embodying my invention, part of the front of the casing being shown as broken away to expose underlying parts; Fig. 2 is a side elevation of the same filter; Fig. 3 is an enlarged perspective view of the perforated and partly reinforced shelf which supports a body of gravel in the filter; Fig. 4 is a top plan of the sheet metal blank from which the perforated shelf is formed. In this view the contraction of the element during the process of manufacture is indicated by dotted lines; Fig. 5 is a diagrammatic top view of the contracted shelf; for the sake of clearness the perforations are not shown in this view; Fig. 6 is a vertical lengthwise section through the same shelf taken on the line 6—6 of Fig. 5; Fig. 7 is a vertical transverse section through the same shelf taken on the line 7—7 of Fig. 5; Fig. 8 is an inside view of one overflow duct, in elevation; Fig. 9 is an enlarged isometric view showing a fragment of one tray-supporting bar; Fig. 10 is a vertical section taken on the line 10—10 of Fig. 9; Fig. 11 is a horizontal section, to reduced scale, on the line 11—11 of Fig. 1, with the basket removed, to show the cross bars upon which the basket rests; and Fig. 12 is a transverse section on the line 12—12 of Fig. 8. Similar reference numerals designate like parts throughout the several views.

59 The casing, designated as a whole by the

numeral 16, is a box-like upright sheet metal structure.

A perforated and corrugated gravel-supporting element 17 is supported in a horizontal position in the casing by means to be described later. A movable shelf 18 is supported, a suitable distance above the element 17. The space between the elements 17 and 18 is filled by gravel 19 or other suitable heavy filtering material. The shelf 18 is covered to a sufficient depth, by a layer of charcoal 20, or other relatively small and light filtering material.

The main structure of the filter is similar to the structure shown in my said patent and therefore need not be described in detail. The present invention relates only to certain improved details of construction now to be described, which are of very considerable practical utility and contribute to strengthen the filter and reduce the cost of manufacture.

The perforated gravel-supporting element 17 is made from a single flat metal blank 21 (Fig. 4) punched to form arcuate notches 22, one at each end of the plate, and pressed to form transverse arcuate ribs 23, and to form concavo-convex lengthwise members 24 strengthening the ribs 23. It is to be understood that the blank will be perforated in order to produce the perforated element 17. Upon reference to Figs. 4 and 5 it will be seen that the length of the blank is considerably greater than the length of the pressed plate, and its width at the two ends is considerably greater than the width of the ends of the pressed plate. In order that the pressed gravel-supporting element may be easily inserted in the casing the width of its middle part will be slightly less than the inside width of the casing.

The shortening of the plate during the process of manufacture is brought about by the forming of the transverse ribs 23. The transverse contraction of the terminal parts of the plate is accomplished during the forming of the tapered corrugations 24. In other words the width of the plate is reduced more at and near its ends than at its intermediate parts, with the result that the



plate may be easily inserted in the casing. The notches 22 in the blank 21 are so designed that they will fit around the periphery of the upright overflow ducts 25 when the shelf has been pressed to its final form.

A number of rivets 26 of suitable size and length extend inwardly through holes punched in the walls of the casing. The rivets are soldered in the punched holes in the walls, and support the element 17 in a horizontal position.

The shape of the woven wire shelf 18 (Fig. 1) is practically the same as the shape of the element 17 and has notches the same as the notches 22 in the member 17, to conform to the outer surface of the ducts 25. A number of rivets 27 of suitable size and suitable length extend inwardly through holes punched in the walls of the casing and are soldered in the punched holes and support the shelf 18 in a horizontal position.

Two upright concavo-convex sheet metal elements 25 (Figs. 1, 2, and 8) are placed against the two opposite walls of the casing, with their concave sides next to the walls, thus forming overflow ducts, the purpose of which is to allow escape of water into the lower chamber of the casing in the event of abnormal depth of water, above the filter bed. The elements 25 have near their lower ends notches 28; and members 29 below the notches and 41 above the notches are expanded somewhat to form protruding lips. When the parts are assembled, the corners 42 on both sides of the notches 22 of the shelf 17, enter the cuts or notches 28 of the duct elements 25. The weight of the duct elements is thus supported on the shelf 17, by the engagement of the lips 41 with the upper surface of the shelf; and the duct elements are held against upward vertical movement, by the engagement of the lips 29 with the under surface of the shelf. As previously explained, the shelf 17 rests on top of the inwardly protruding ends of the rivets 26. The arcuate edges of the shelf 18 also press against the outer surface of the duct elements and hold them in close contact with the inner surface of the walls of the casing. When the filtering material (19 and 20) is in place on the shelves, it becomes packed around the duct elements and further secures them in place. When the filtering material is removed from the shelves they can be lifted out and the ducts may then be taken out and cleaned; after cleaning, the ducts and shelves can be easily and quickly reassembled in the casing.

Two parallel sheet metal bars 30 (Figs. 2, 9, 10 and 11) support the basket in the cabinet. Each bar is formed from a strip of sheet metal by pressing it into the shape of a channel having two lengthwise corrugations 31 and downwardly extending flange members 32, as shown in cross section in Fig.

10. The bars are supported by aligned rigid rivets 33 secured in opposite walls of the casing.

After the rivets are in place the channel bars will be placed on top of the rivets, two rivets at each end of each bar, and each flange 32 will be clinched into tubular form, around the respective rivets, to prevent accidental displacement of the bars. The right-hand flange of one channel bar is shown so clinched, at 32' in Figs. 9 and 10. This structure strengthens the casing against collapsing and spreading and also forms a dependable support for the basket.

The wire basket 39 is adapted to fit loosely inside of the casing and is supported on the bars 30. A strainer-fabric 40 of cheese-cloth, or the like, lines the basket and serves to strain the water passing through the basket. The strainer-fabric may be attached to the basket by any suitable means.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A unitary perforated structure for the support of filtering material, comprising: end members having longitudinal tapered corrugations; a flat middle member; and transverse arched members between said middle member and said end members and adjoining the ends of said corrugations.

2. In a filtering apparatus, the combination of: a perforated filter plate having notched ends; and a pair of upright concavo-convex duct elements conformed to the notches of said filter plate and having cuts near their lower ends with outwardly bent lips adapted to engage said filter plate at the margins of said notches.

3. In a filtering device, having a case, a first filter element, a second filter element, and a third filter element, in cooperative relation, the combination of: inwardly projecting rivets, fixed in the walls of said case in three tiers; sheet-metal channel bars having longitudinal ridges and downwardly disposed flanges, adapted to rest upon the rivets of the uppermost tier, whereby to detachably support said first filter element; a pervious flat shelf, removable from said case, notched at both ends and adapted to rest upon the rivets of the second tier, whereby to support said second filter element, a ribbed shelf, of perforated sheet-metal, removable from said case, notched at both ends, and adapted to rest upon the rivets of the lowermost tier, whereby to support said third filter element; and removable sheet-metal overflow duct elements adapted to be held by the notches of said shelves in operative relation to said first and second filter elements.

4. Means for detachably supporting the filtering elements in the case of a filter, comprising: a plurality of inwardly projecting rivets in the walls of said case, arranged in



horizontal tiers; a pervious, corrugated shelf, adapted to rest upon the lowermost tier of rivets, whereby to support a lower bed of filtering material; a secondary, pervious shelf adapted to rest upon an intermediate tier of rivets, whereby to support an intermediate bed of filtering material; and a pair of sheet-metal channel beams having their ends adapted to rest upon the rivets of the uppermost tier, whereby to support a pervious filtering basket above said intermediate filtering material, each of said beams having upwardly pressed longitudinal ribs adapted to stiffen the beam, and having channels beneath said ribs adapted to receive the projecting ends of said rivets, and having downwardly extending longitudinal flanges adapted to be clinched around said rivets.

5. In a water filter having a metal case, the combination of: upper and lower sets of rivets fixed in the vertical walls of said case with the ends of said rivets protruding inwardly; a sheet-metal shelf adapted to support a filter bed on the lowermost set of rivets; and sheet metal beams adapted to support a straining basket, on the uppermost set of rivets, said beams having downwardly projecting flanges adapted to be clinched around said rivets to hold said beams securely in place in said case.

6. The combination of: a filter case; a lower shelf, having a notch at each end, removably supported in said case; an upper shelf, having a corresponding notch at each end, removably supported in said case; and a pair of removable duct elements conformed to the notches in both shelves and adapted to be held against the walls of said case in a substantially vertical position by contact with said notched shelves, each of said duct elements having cuts near its lower end adapted to receive the edges of the lower shelf, whereby to support the weight of said duct element and prevent vertical movement thereof.

7. A supporting structure for filtering material, formed from a single rectangular blank of perforated sheet metal by: notching the two ends of said rectangular blank to accommodate removable overflow ducts; forming a pair of parallel, transverse ribs in said rectangular blank; and forming tapered, longitudinal ribs from said transverse ribs to the ends of said blank, thereby stiffening the completed structure and reducing the terminal width thereof.

In witness whereof I have hereunto signed my name, at Bloomington, McLean County, State of Illinois, this 17th day of August, 1928.

LEROY W. FRENCH.