Jan. 2, 1923.

1,440,478

P. L. McKEE.

ROOF STRUCTURE.

FILED NOV. 21, 1921.

2 SHEETS-SHEET 1

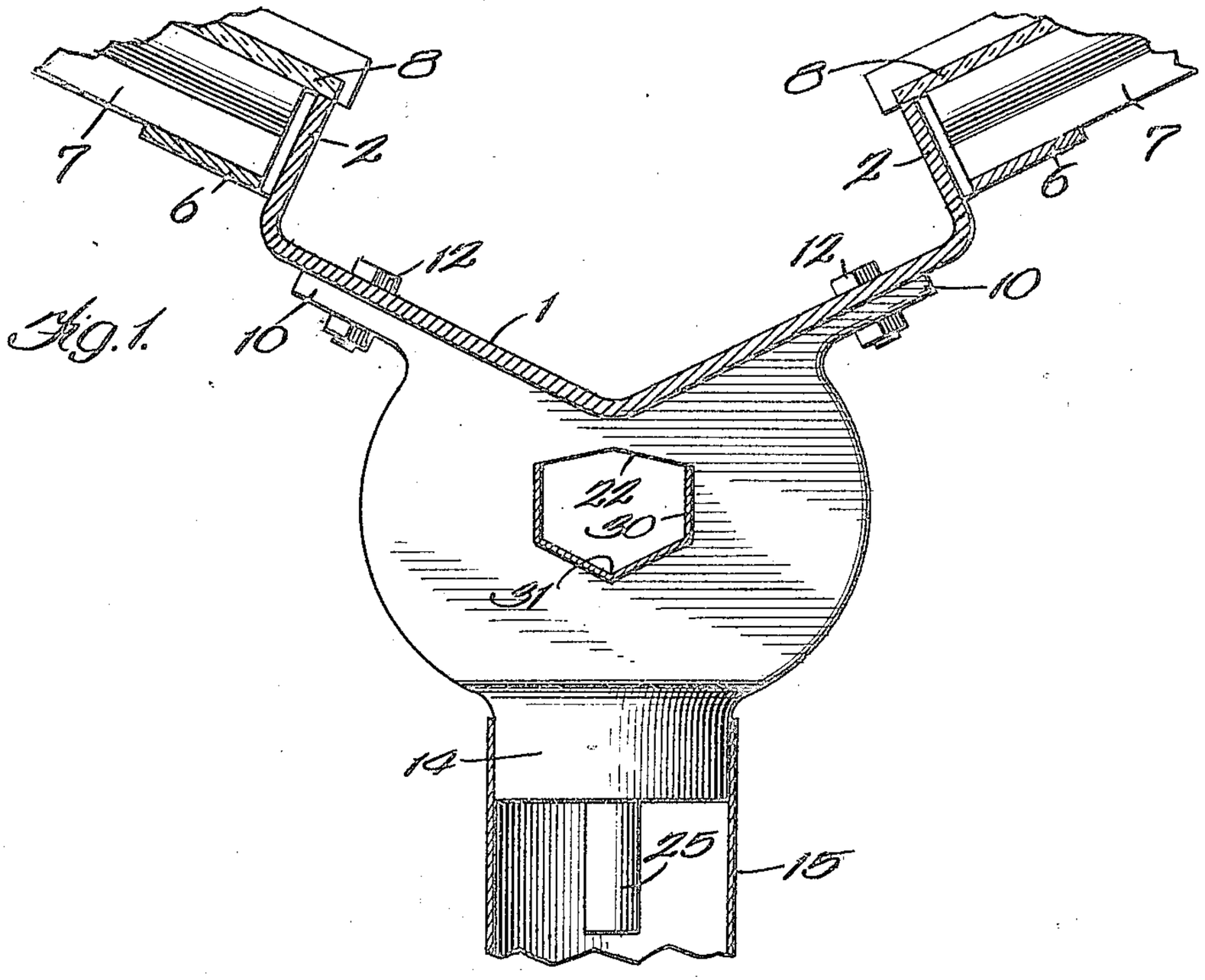

Fig. 1.

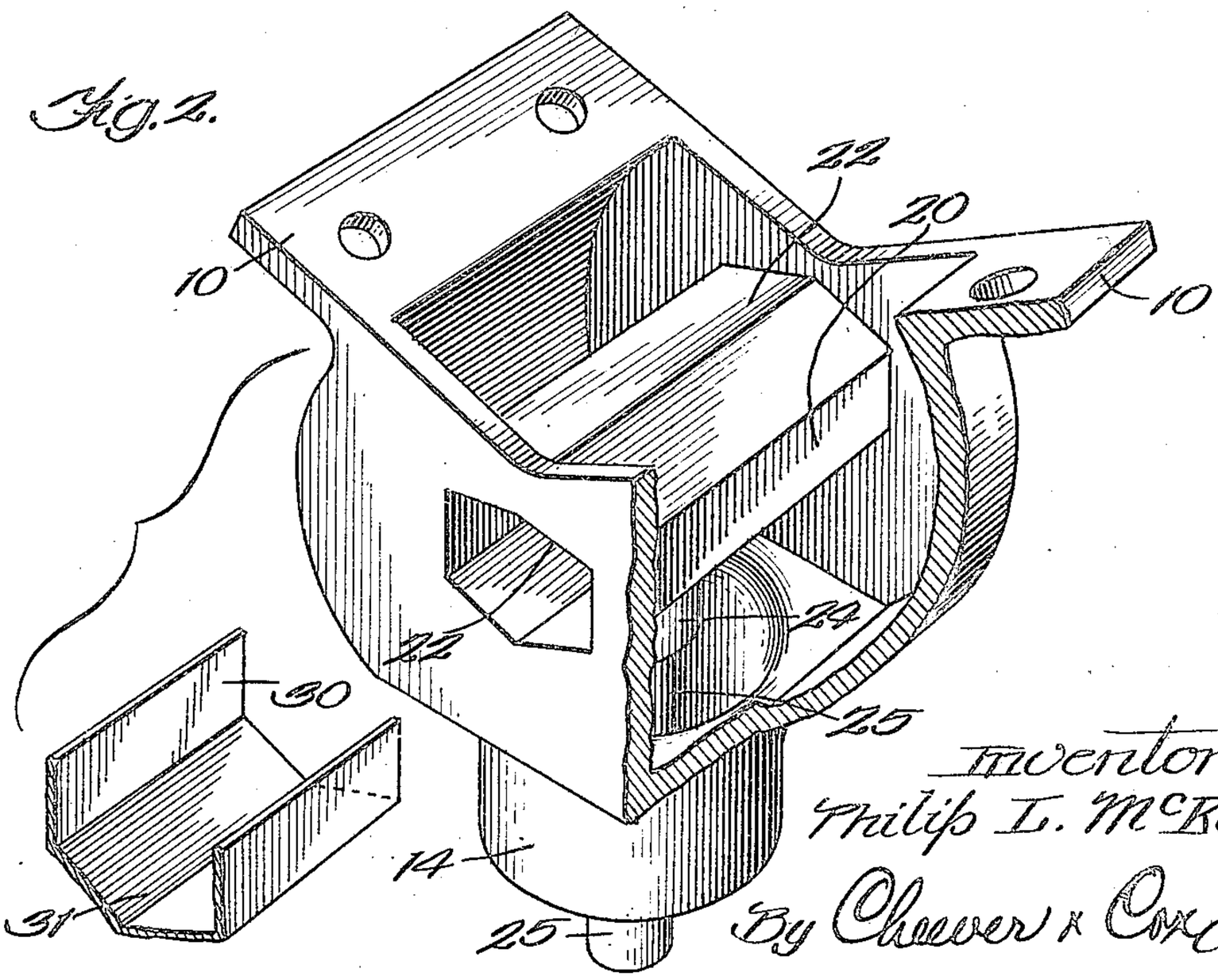

Fig. 2.

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Fig. 3

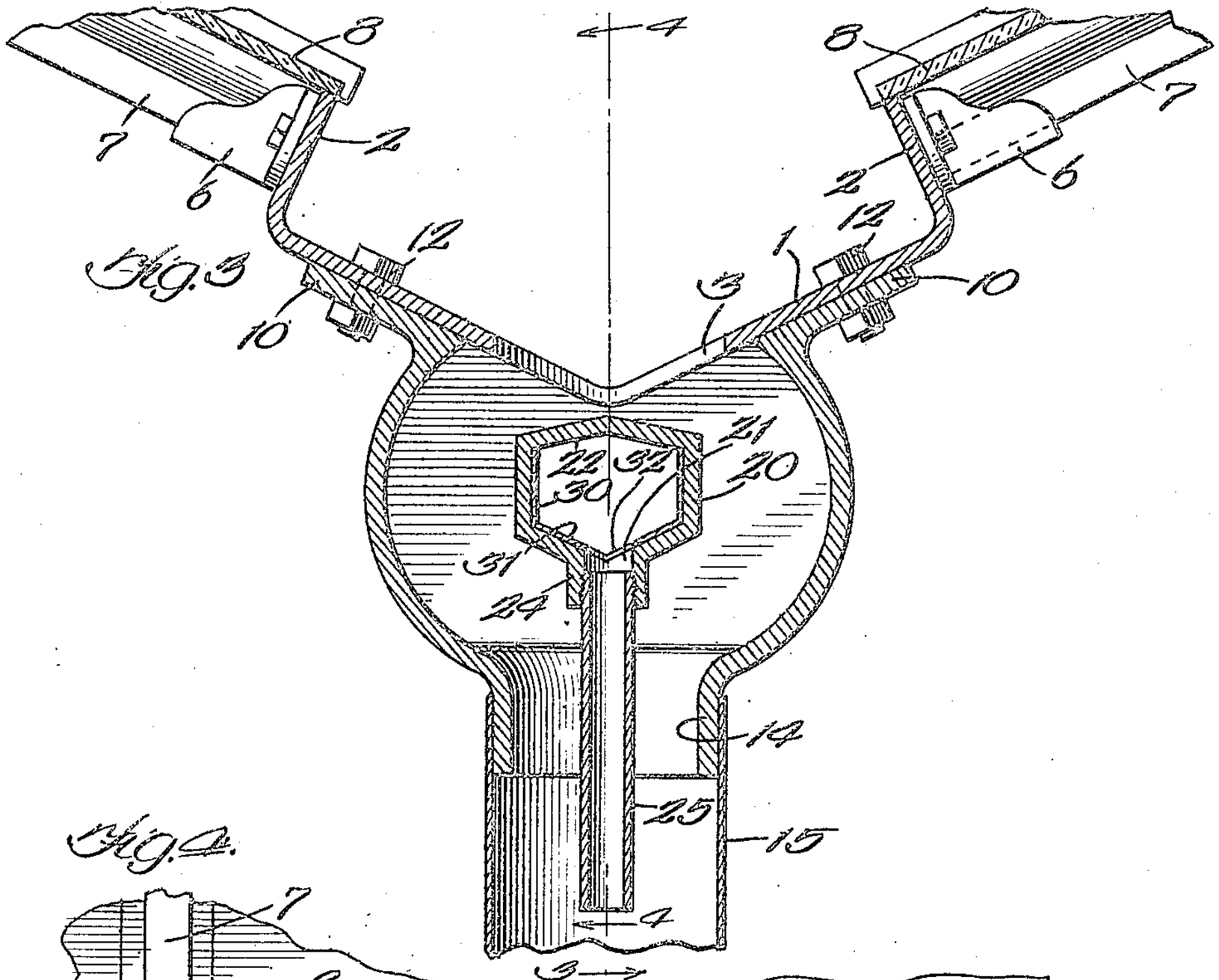
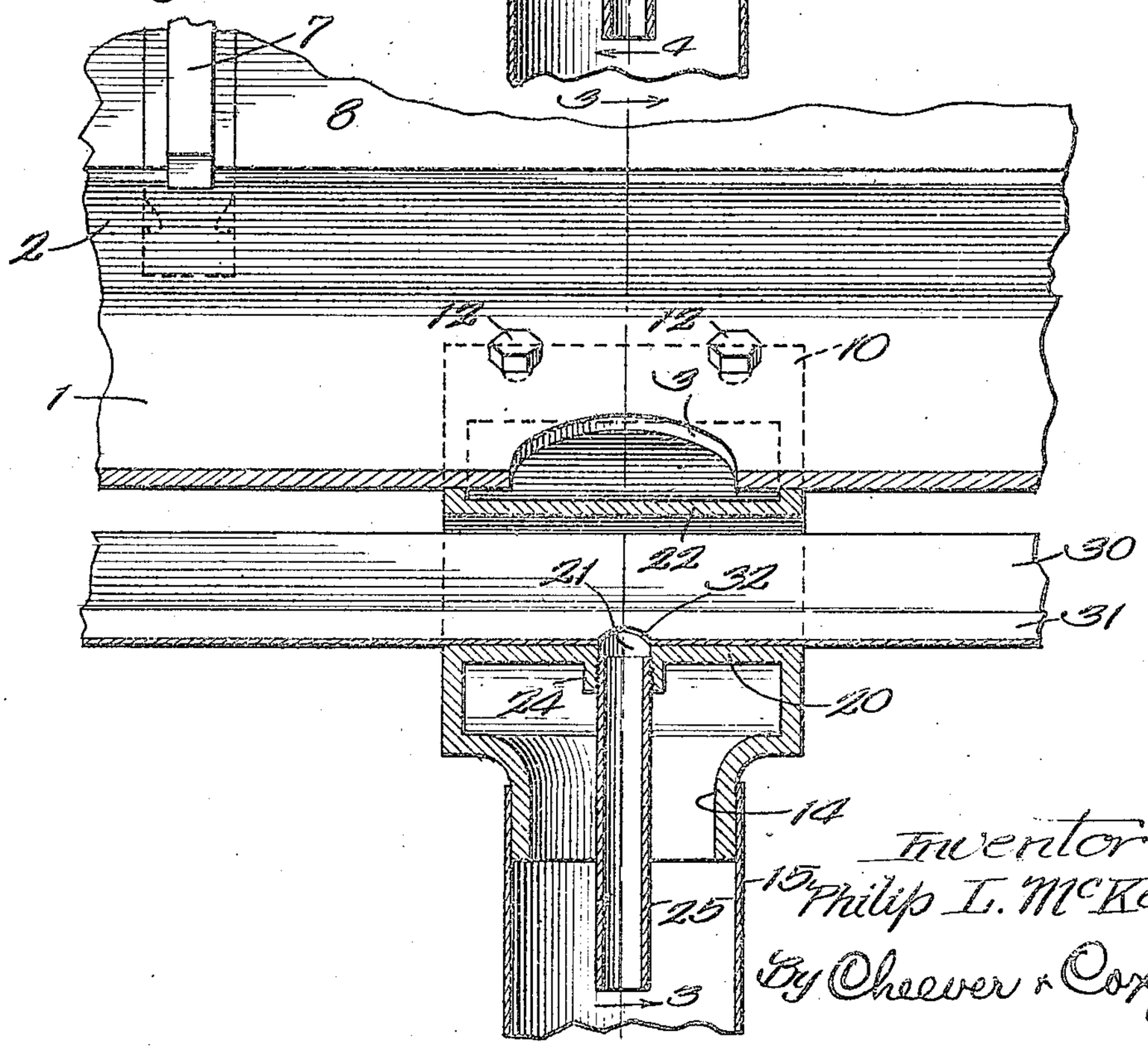


Fig. 4.



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Patented Jan. 2, 1923. 1,440,478

UNITED STATES PATENT OFFICE.

PHILIP L. McKEE, OF CHICAGO, ILLINOIS.

ROOF STRUCTURE.

Application filed November 21, 1921. Serial No. 516,588.

To all whom it may concern:

Be it known that I, PHILIP L. McKEE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Roof Structures, of which the following is a specification.

My invention relates to greenhouse construction and relates particularly to a downspout fitting and associated parts. The fundamental object of the invention is to provide a simple, compact and durable construction for carrying off the water into a downspout. A specific object is to provide a fitting which will serve the dual purpose of receiving and delivering water both from the main gutter and from a sub-gutter, the latter receiving the water which occurs on the inside of the greenhouse from spray and condensation. Another object of the invention is to provide a fitting which will simplify the installation of the downspout and associated parts.

I accomplish my objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is an assembly view showing the fitting, the main gutter, sub-gutter, the downspout and associated parts. The view is an elevation, partly in section.

Figure 2 is a broken-away perspective of the fitting.

Figure 3 is similar to Figure 1, but shows certain of the parts in section to better reveal the internal construction. The plane of section is indicated by the line 3—3, Figure 4.

Figure 4 is an elevation of the fitting and associated parts, the view being taken partly in section on the line 4—4, Figure 3.

Like numerals denote like parts throughout the several views.

The main gutter 1, is a shallow V-shaped duct having flanges 2 at the sides and an opening 3 at the center. Gutters of this type are in common use. Attached to the flanges of the gutter are brackets 6 which support the lower ends of sash bars 7. Above these bars are panes 8 of glass as usual. It will be evident that the water shed from the panes will be delivered into the gutter and will be conveyed to the opening 3 which is distributed at suitable intervals under the gutter. The fitting which forms an important element of the invention is, according to the present design, a hollow casting having wings 10 adapted to fit against the under side of the main gutter on opposite sides of its central opening 3. These wings are fastened to the gutter by bolts 12 or other suitable means. The fitting between the flanges is open at the top for receiving water from the aperture 3 and has a boss or circular flange 14 at the bottom for fitting into the downspout 15. Ordinarily downspouts are cylindrical and hence the boss 14 will usually be cylindrical in form.

A duct 20 passes horizontally through the fitting from one end to the other. It is open at the ends and coterminate with the fitting as best shown in Figures 2 and 4. In the illustrated form the duct is imperforate except for an opening 21 in the bottom, which by preference is located over the middle of the opening in the boss 14. In the present case this duct is located intermediate of the top and the bottom of the fitting and the integral cover 22 slopes gently downward from the sides for shedding the water which comes in through apertures 3. It is desirable to provide an internally threaded boss 24 at the bottom of the opening 21 for receiving the upper threaded end of a nipple or short piece of pipe 25. This nipple when used should descend somewhat below the upper end of the downspout to make it certain that the water discharging through it will not leak out over the top of the downspout. This nipple may, however, be omitted if desired.

The cross-section of duct 20 may be varied to suit conditions but a convenient form of sub-gutter is one in which the sides are parallel and the bottom slopes gently from the two sides toward the middle. This type is illustrated in the drawings, the sub-gutter having sides 30 and a bottom 31. An aperture 32 is formed in the sub-gutter immediately over the opening 21 for delivering water thereto.

In practice, after the parts are assembled in the manner shown, the water flowing down from the top of the roof will flow into the main gutter 1 and along this gutter until its reaches one of the openings 3. It then descends into the fitting, part of it falling directly to the bottom of the fitting and part of it falling onto the closed top of the duct 20 and thence through the bottom of the fitting. The water thus collected from the top of the main gutter flows out

through the boss 14 and down into the main spout 15.

It will be understood by those familiar with the construction and operation of greenhouses that considerable quantities of water are collected from the inside of the building as well as from the outside. This is due to the spray deflected from the plants during watering and is also due to the condensation which is constantly going on of the moisture carried in the air in the building. The warm moist air striking against the colder parts of the roof is condensed and is conveyed by the sash bars to the under surface of the main gutter, after which the water trickles down into the sub-gutter 30.

In my construction the water from the top of the roof and the water from the inside of the building flow into the same fitting and thence into the downspout. This is not only an economical construction, but improves the appearance, for the outlet of the sub-gutter is invisible and no separate downspout is required. Nor is it necessary to puncture the downspout to lead the sub-gutter into it. Furthermore, the construction is quite efficient in the sense of being waterproof, and as the water from the top of the roof cannot gain access to the sub-gutter, there is no danger of having the sub-gutter flooded by water from the top of the roof.

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

1. A building structure having a main gutter for receiving water from the roof, said gutter being concave and having an aperture in the bottom, a downspout fitting conforming to the bottom of the gutter and adapted to be attached to it, the fitting being open top and bottom, a downspout connecting with the bottom of the fitting, a duct in the fitting extending from end to end thereof and having an opening in the bottom, and a sub gutter adapted to discharge into said duct.

2. In a greenhouse, the combination with the slanting sash bars of a main gutter, concave at the bottom and having an oblique flange extending at right angles to the sash bar, means for connecting the sash bar to the gutter, the gutter having a hole in the bottom, a downspout fitting having an opening at the top adapted to register with the opening in the gutter, the fitting also having an opening in the bottom, a downspout communicating with the bottom of the fitting, a duct extending from end to end of the fitting and having a discharge aperture in the bottom, and a sub gutter adapted to discharge into said duct.

3. In a greenhouse, a downspout fitting having openings at the top and bottom for receiving and discharging water from the roof, and a duct leading horizontally thru the fitting and having an opening in the bottom adapted to discharge thru the bottom opening.

4. In a greenhouse, a downspout fitting having an opening in the top and bottom, and a duct passing horizontally thru the fitting, said duct being covered at the top for shedding water descending from the opening in the top of the fitting, and having an opening in the bottom for discharging thru the opening in the bottom of the fitting.

5. A downspout fitting for greenhouses having means at the top for attachment to the main roof gutter, said fitting being open at the top for receiving water from said gutter, and open at the bottom for discharging water, the fitting also having a transverse duct which is adapted to shed water from the top and sides but has an opening in the bottom for the discharge of water entering said duct from the ends.

6. A downspout casting for greenhouses, said casting being hollow, open top and bottom, and adapted to be attached at the top to the main roof gutter, and an integral duct running transversely thru the casting and open at the ends for connection with a sub gutter, said duct being closed at the top and having an opening in the bottom above the opening in the bottom of the casting.

7. A downspout casting for greenhouses, said casting being hollow, open top and bottom, and adapted to be attached at the top to the main roof gutter, and an integral duct running transversely thru the casting and opening at the ends for connection with a sub gutter, said duct being closed at the top and having an opening in the bottom, and said duct being located intermediate the top and bottom of the casting.

8. A fitting for downspouts for greenhouses consisting of a hollow casting having wings at the top for engaging the bottom of the main roof gutter, the fitting being open at the top for the reception of water from said gutter and having a boss at the bottom for connection with a down spout, and a duct passing horizontally through the fitting; said duct being imperforate except at the bottom where it has an opening for discharging into the downspout, and said duct being open at the ends and the ends being substantially coterminate with the ends of the fitting.

In witness whereof, I have hereunto subscribed my name.

PHILIP L. McKEE.