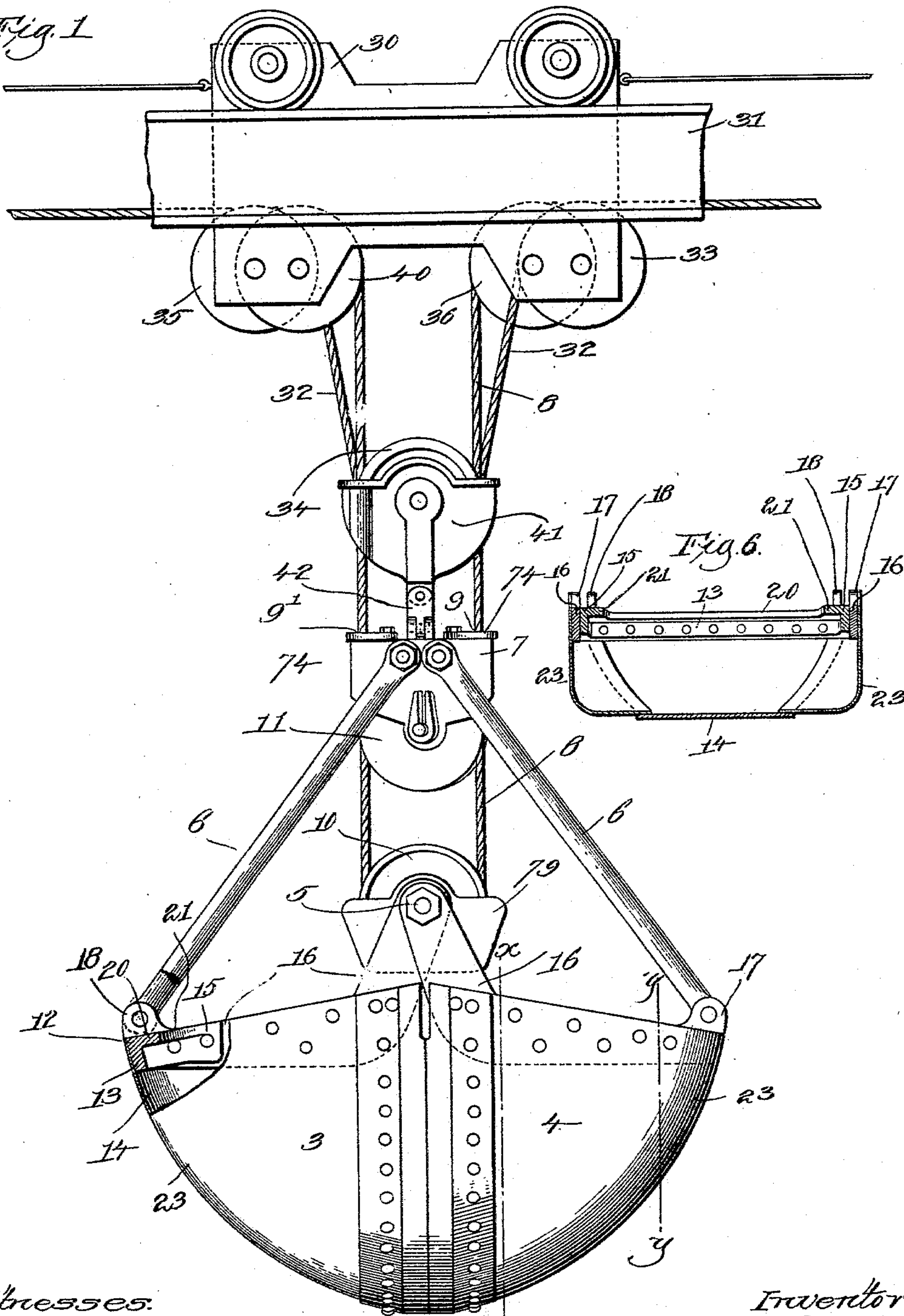


A. E. NORRIS.  
HOISTING BUCKET.

APPLICATION FILED AUG. 14, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1*

Witnesses:

W. C. Simpson.

Fred S. Grumbel.

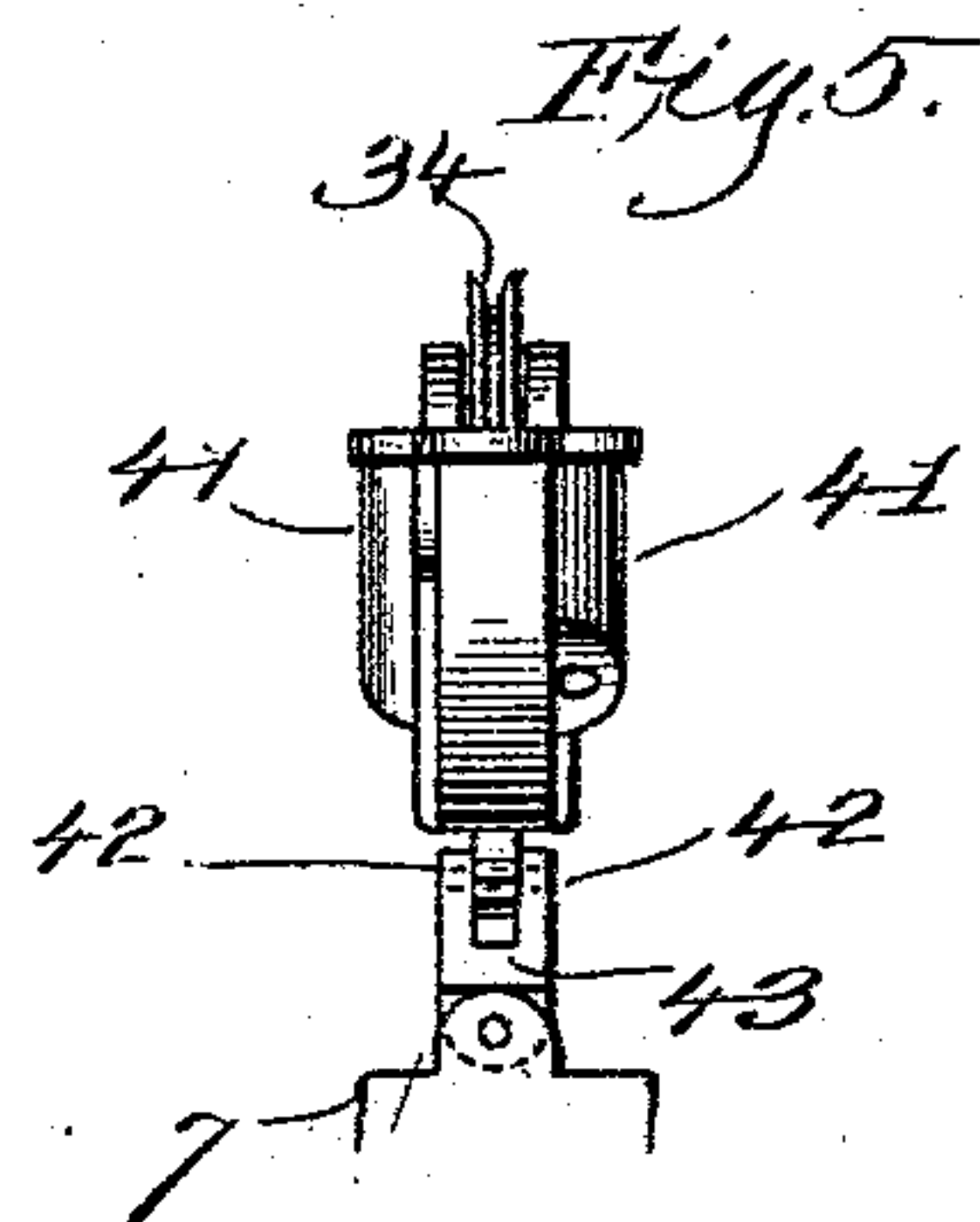
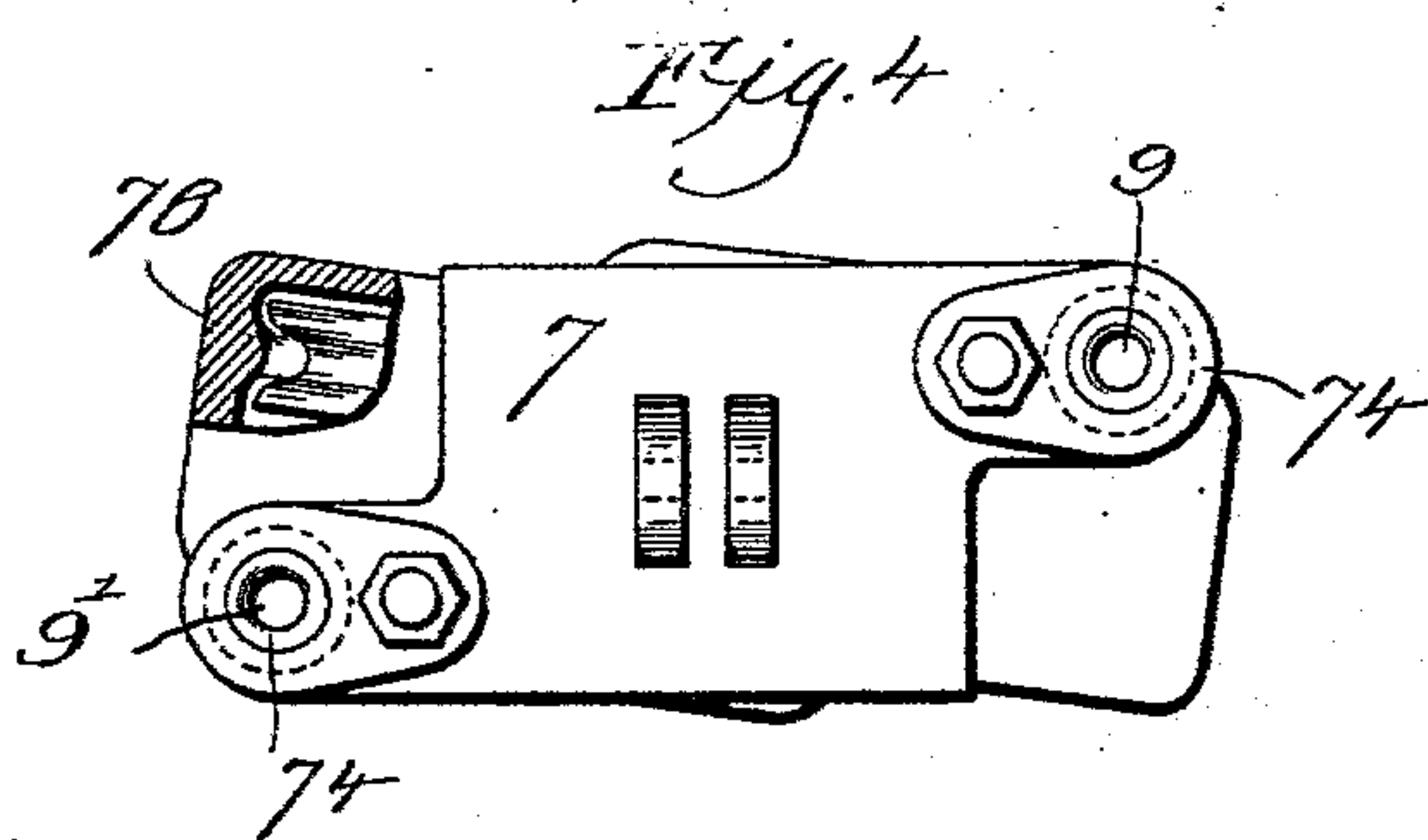
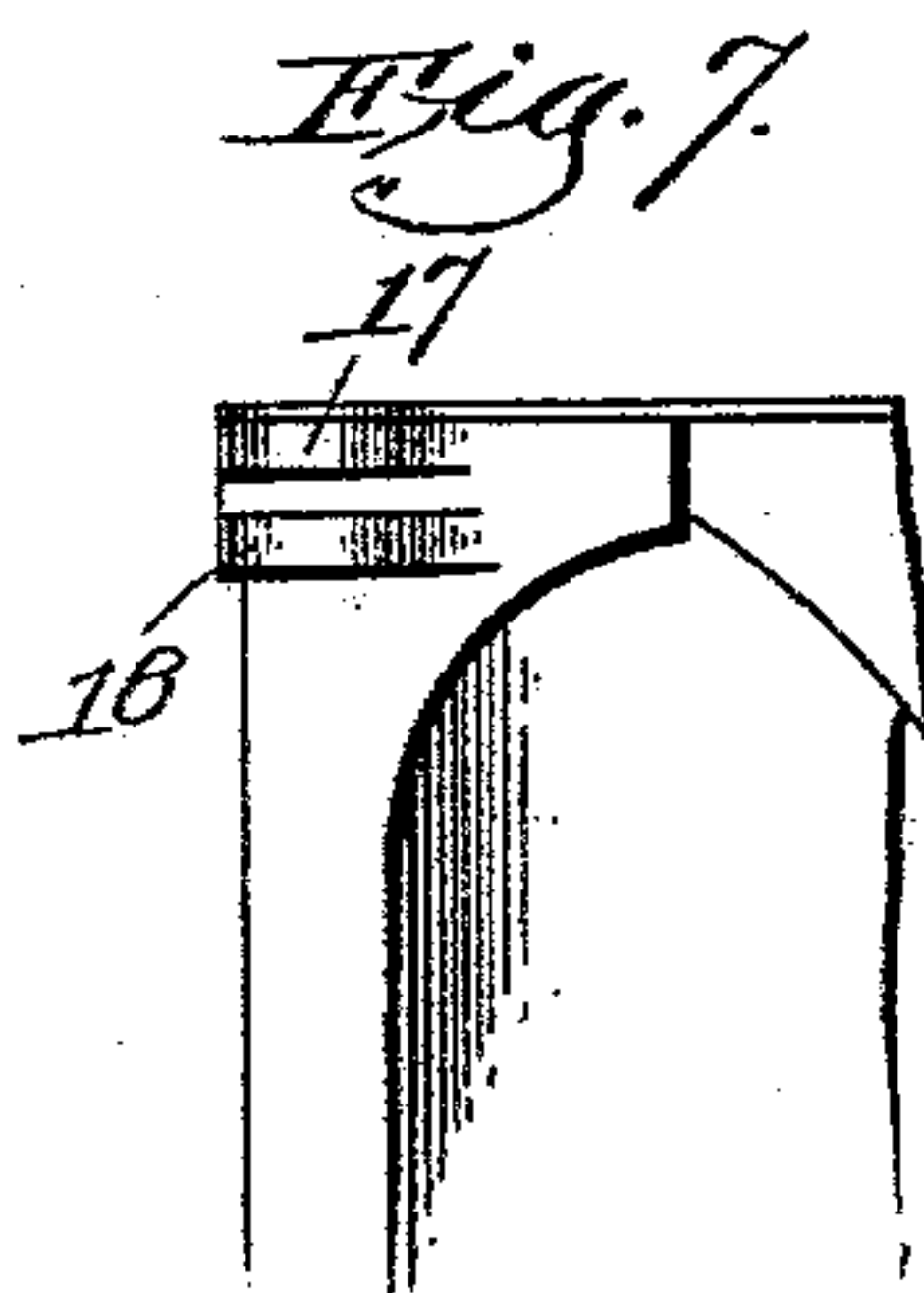
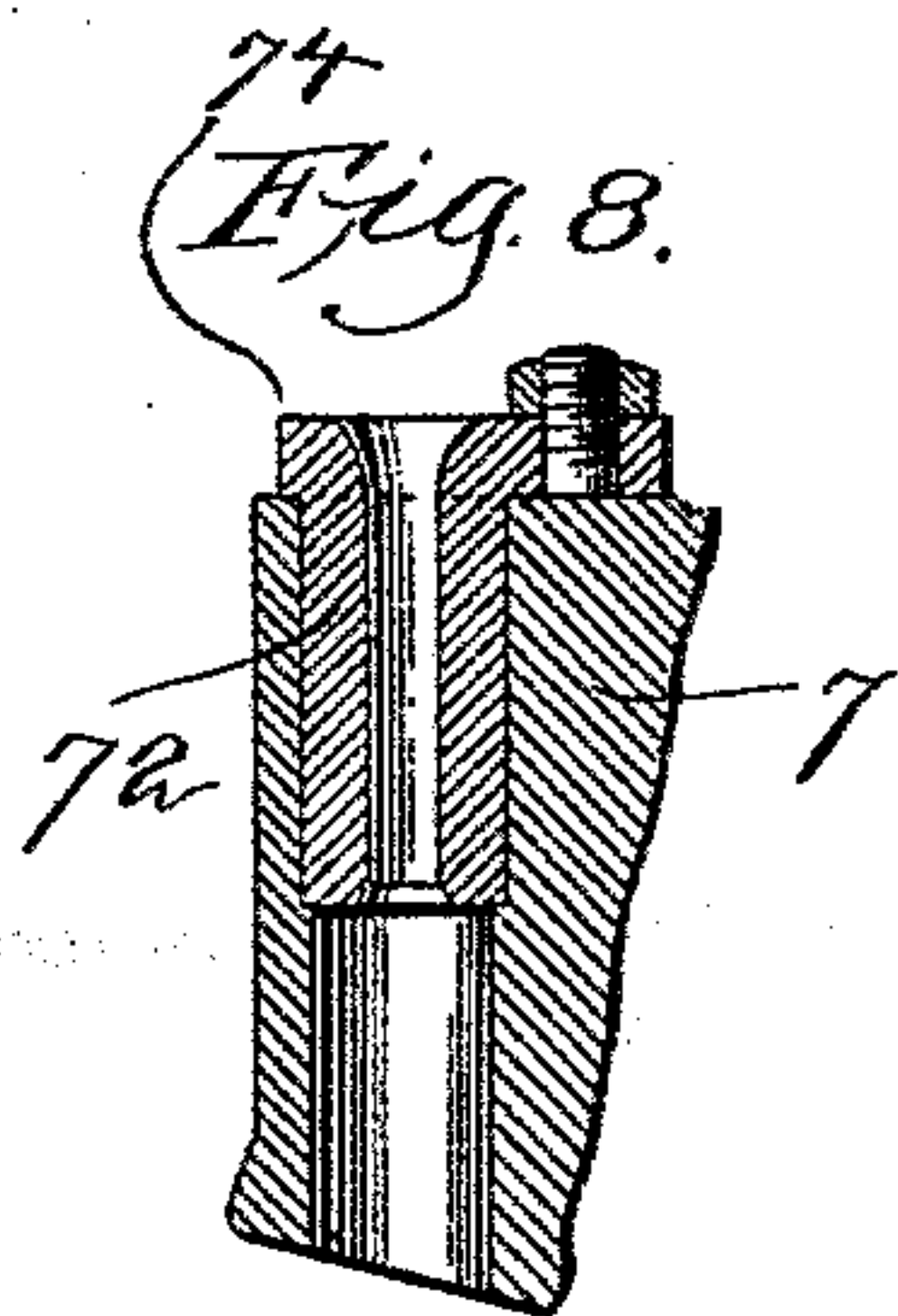
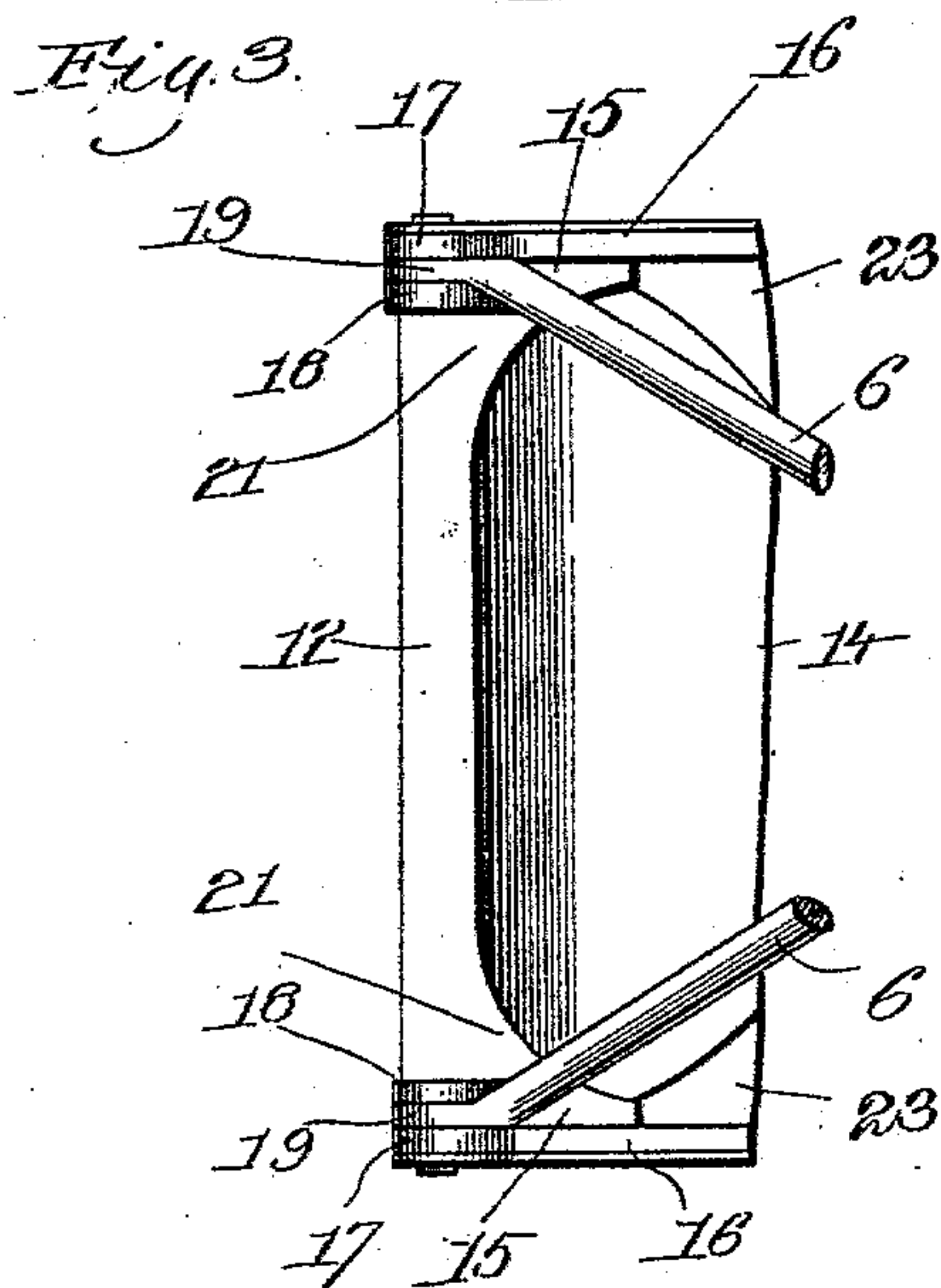
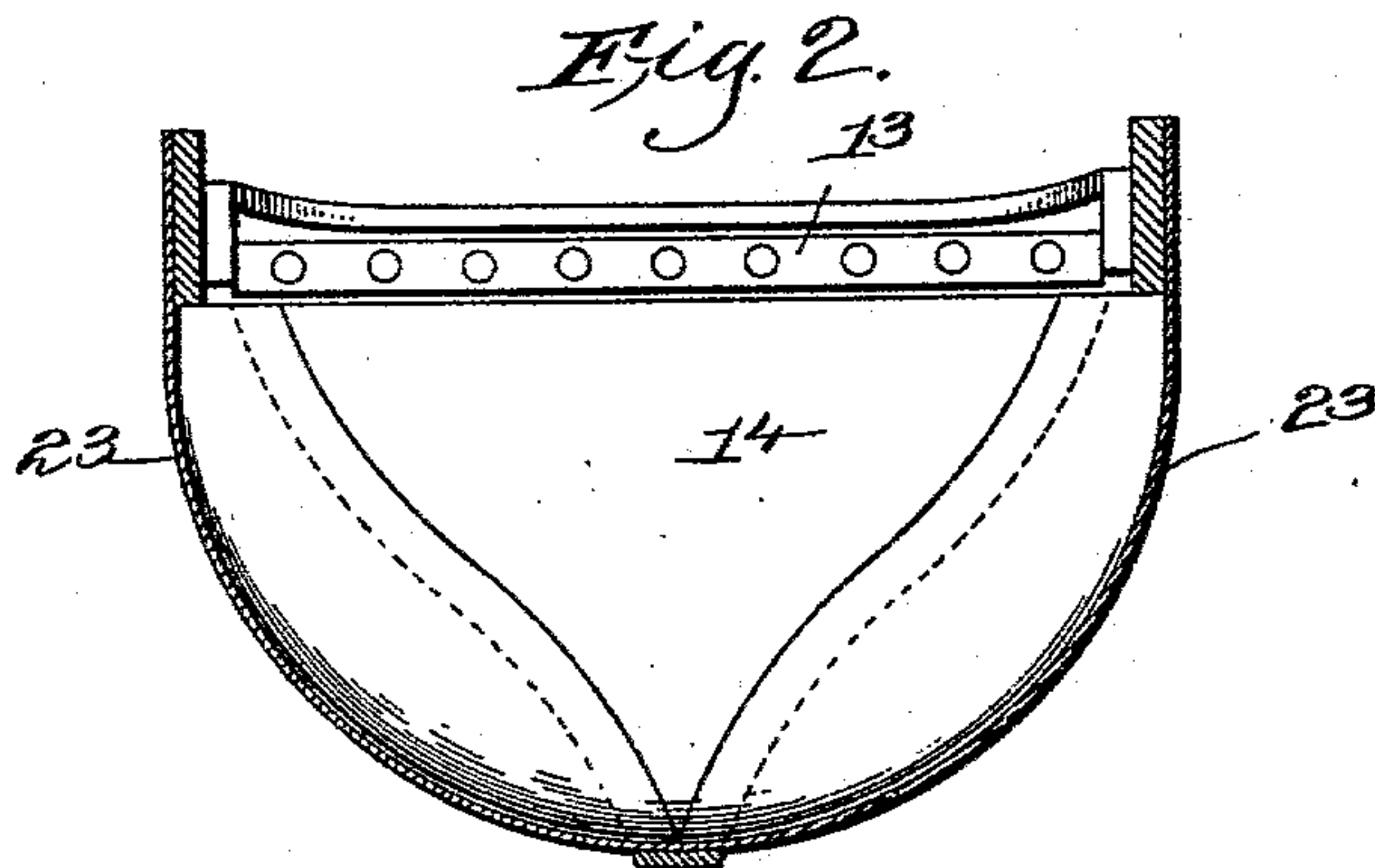
Inventor  
Almon E. Norris,  
by Lewis A. Maynard,  
Att'y.

A. E. NORRIS.  
HOISTING BUCKET.

APPLICATION FILED AUG. 14, 1903.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:

W. C. Simpfar.

Fred S. Grunhof.

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attys.



# UNITED STATES PATENT OFFICE.

ALMON E. NORRIS, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO RAWSON & MORRISON MANUFACTURING COMPANY, OF CAMBRIDGE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## HOISTING-BUCKET.

SPECIFICATION forming part of Letters Patent No. 745,653, dated December 1, 1903.

Application filed August 14, 1903. Serial No. 169,498. (No model.)

*To all whom it may concern:*

Be it known that I, ALMON E. NORRIS, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Hoisting-Buckets, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to clam-shell buckets, and has for its object to improve the type of bucket illustrated in Patents No. 699,000, dated April 29, 1902, and No. 699,343, dated May 6, 1902, the improvement relating to the shape of the bucket-segments, the novel means employed for stiffening said segments, and the novel manner in which the bucket is supported.

The particular features of the invention will be more fully described, and pointed out in the claims.

In the drawings, Figure 1 is a side view of my improved bucket. Fig. 2 is a section of the bucket-segment on the line  $x x$ , Fig. 1. Fig. 3 is a top plan view of one end of one bucket-segment. Fig. 4 is a top plan view of the head of the bucket. Fig. 5 is a view of the supporting-sheave for the head. Fig. 6 is a section of one of the bucket-segments on the line  $y y$ , Fig. 1. Fig. 7 is a modification, and Fig. 8 is a section through the leader.

The bucket herein illustrated is of the familiar clam-shell type and comprises the two bucket-segments 3 and 4, each having the hinges or hinge-arms 16, which are pivotally connected together by the pivotal rod or shaft 5 and are pivotally connected with the head 7 by the links 6.

8 designates the opening and closing rope, which is taken through a guide-eye 9 in the head 7 and around sheaves 10, mounted on the rod 5, and over sheaves 11, carried by the head, as usual in this class of buckets. The form of head I have herein illustrated is similar to that described and claimed in my above-mentioned patent, No. 699,343—that is, it is constructed so that the sheaves 11 have an angular relation to the sheaves 10.

The parts thus far described are such as

are common to all clam-shell buckets of the well-known Rawson type.

One feature of my present invention relates to the manner of stiffening the bucket-segments. Extended across the upper rear corner of each segment is a stiffening member 12, the body portion of which is preferably of angle-iron form, as shown in Fig. 1, wherein a portion of the bucket-segment is broken out to better show the construction of said stiffening member. The vertical flange 13 of the stiffening member is riveted to the back and bottom of the bucket-segment. The ends of said stiffening member are formed with forwardly-projecting arms or flanges 15, which are rigidly secured to the sides of the bucket. In the form of the invention herein shown said arms or flanges overlie and are riveted to the hinges 16, which extend along and are secured to the upper edges of the sides of the bucket-segments and are in turn pivoted or hinged to the rod 5. The outer end of each hinge member 16 is formed on its upper edge with the eye or lug 17, and each end of each stiffener has rising therefrom a lug 18, which is alined with the corresponding lug 17, but spaced therefrom a sufficient distance to receive the eye 19 at the end of one of the links 6. A pin passing through the lugs 17 and 18 and the eye 19 serves to pivotally connect each link to the bucket-segment.

The arms 15 of the stiffening members are connected with the horizontal flange 20 thereof by means of a curved web or filling-piece 21, said webs 21 acting as braces to hold the bucket-segments in shape. With this form of stiffening member it is unnecessary to employ separate braces for holding the shape of the bucket, as is done in Patent No. 699,000.

A bucket-segment constructed as described above has a single continuous stiffening member connecting the sides of the segment and has integral therewith and rising therefrom lugs to which the links are pivoted. This construction carries the pivotal point of the links and lugs above the top edge of the bucket-segments. By placing the eyes 19 between lugs on the stiffening members and arms 16 the pin which passes through said lugs and eyes serves not only as a pivotal pin,



but also as a means to tie the hinge-arms and stiffening member together, and thus strengthen the segments.

In said Patent No. 699,000 is illustrated a bucket-segment having its sides, bottom, or back connected by a curved portion of progressively-increasing radii from the back of the bucket-segment toward the jaw end thereof, the purpose of this construction being to stiffen the bucket and the segment and to enable it more easily to enter the material being scooped up. I have discovered from experiment that the bucket-segment can be still further strengthened and its entrance into the material being dug greatly facilitated by giving it a substantially half-round or semicylindrical jaw end, as herein illustrated. From Fig. 2 it will be seen that the jaw end of the segment is substantially semicylindrical, while from Fig. 6 it will be seen that the back or upper portion of the bucket is approximately square or rectangular—that is, with vertical sides and a flat bottom. The flat bottom is connected with the vertical sides by a curved portion which has a progressively-increasing radius from the back of the bucket-segment to the jaw thereof, and the variation in the radius of curvature of said portion is such that at the jaw end of the segment the flat bottom has disappeared and the segment presents a half-round or semicircular shape.

I prefer to make each bucket-segment with the back and bottom plate 14 and the two side plates 23. The back and bottom plate is flat on sections taken transversely of the segment, as shown in Fig. 6, but is curved from the rear edge to the jaw end of the segment, or, in other words, on lines longitudinally of the segment. The curved portion connecting the vertical sides and flat bottom of the segment comes in the side plates 23, so that the lower edges of said plates are curved in lines transversely of the segment. With this construction the bottom and back plate 14 has a progressively-decreasing width from the upper rear corner toward the jaw end of the bucket, and the decrease in width is such that it comes substantially to a point at the jaw end. This construction forms an exceedingly rigid bucket-segment, which has a maximum facility for entering the material.

In order to keep the rope from running out of the grooves in the sheaves 11, I have herein shown the head as having the ribs 78 on its interior, which are aligned with the grooves in said sheaves 11 and are partially received therein. The same rib construction may be used in the opening in the weight 79, in which the sheaves 10 are partially received, if desired.

I have illustrated the bucket as being suspended from a suitable carrier 30, mounted on a trackway 31. The holding-rope 32 passes over the direction-sheave 33 on the carrier, under the sheave 34, attached to the head 7 of the bucket, and over another direction-

sheave 35 on the carrier and thence to the winding-drum. (Not shown.) The opening and closing rope 8 also passes over a sheave 36 on the carrier and thence through the eye 9 and around the pulleys 10 and 11, as above described. After the opening and closing rope leaves the last pulley 10 it is taken through a guide-eye 9' on the head and passed over the direction-roll 40 on the carrier, from whence it passes to a suitable winding-drum. (Not shown.) The sheave 34 is journaled in a suitable frame or carrier 41, which is connected to the head by means of a universal joint, so constructed that the head cannot twist about a vertical axis with reference to the sheave. As herein illustrated, said sheave is pivoted between two ears 42 of a block 43 to swing about a horizontal axis when the bucket is upright, and said block 43 is pivoted to the head 7 to turn about a horizontal axis which is at right angles to the axis of the pivot between the frame and block. This construction permits the frame 41 to tip or swing in any direction, but prevents it from twisting or turning about a vertical axis with reference to the bucket. This same manner of supporting the bucket might be employed in case the bucket is supported from a boom, as well as when the bucket is supported on a track, as shown in Fig. 1. I intend the term "carrier," therefore, as used in the claims to cover both these constructions. The advantage of this manner of supporting the bucket lies in the ease with which the bucket can be moved in either direction upon the trackway and also raised and lowered in any position and opened and closed at any desired elevation.

Instead of placing the lug 17 on the hinge-arm said lug, as well as the lug 18, may be formed on the stiffening member, as shown in Fig. 7. This construction could be employed when the hinge-arms 16 did not extend to the upper rear corner of the bucket-segment.

To prevent the opening and closing rope from wearing the guide-eyes 9 and 9', I employ the leaders 74, which are detachably secured to the head and have an aperture there-through slightly smaller than those in the head. These leaders are shown as having depending stems 72, which sit into the upper end of the aperture through the head.

Obviously many changes may be made in the details of the construction without departing from the spirit of the invention as expressed in the appended claims.

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

1. In a clam-shell bucket, a bucket-segment having at its upper rear end substantially vertical sides, and a horizontal back or bottom, and at its jaw end a substantially half-round or semicylindrical shape.

2. A bucket-segment for a clam-shell bucket having each of its vertical sides connected to



its back and bottom by a curved portion which has a progressively-increasing radius from the upper rear edge of the segment to the jaw end, the increase in radius being such that the jaw end of the segment is semicircular.

3. A bucket-segment for a clam-shell bucket having two side plates and a back or bottom plate, the latter being straight on lines transversely of the segment, and curved on lines longitudinally thereof, and the side plates being curved on lines transversely of the segment, and straight on lines longitudinally thereof.

4. In a clam-shell bucket, two bucket-segments each having at its rear upper edge a stiffening member provided at its end with flanges which are rigidly secured to the bucket sides, and a bracing or strengthening web uniting the flanges and body of the member, said webs serving as braces to hold the bucket in shape.

5. In a clam-shell bucket, two bucket-segments each having extending across its upper rear edge a stiffening member presenting a vertical flange which is united to the back of the bucket, and a horizontal flange, said members each having at its ends arms which extend forwardly along the sides of the bucket, and which are connected to the body of the said member by bracing or strengthening webs.

6. In a clam-shell bucket, a bucket-segment having a stiffening member extending across its upper rear edge, and secured thereto, said member having forwardly-extended arms united to the sides of the bucket, and a bracing member integral with the stiffening member and operating to hold the bucket in shape.

7. In a clam-shell bucket, a head having two guide-eyes, two bucket-segments pivotally connected together, links connecting said segments and head, a carrier from which the bucket is supported, and an opening and closing rope depending from the carrier, passing through one of said guide-eyes and around sheaves carried by the head and bucket-segments respectively, and thence through the other guide-eye back to the carrier.

8. In a clam-shell bucket, a head having two guide-eyes, two bucket-segments pivotally connected together, links connecting said segments and head, a carrier from which said bucket is supported, and an opening and closing rope depending from the carrier, passing through one of said guide-eyes and around sheaves carried by the head and bucket-segments and thence through the other guide-eye back to the carrier, combined with a sheave connected to the head, and a holding-rope passed under said sheave and in a bight of which the bucket is supported.

9. A bucket-segment for a clam-shell bucket, said segment having a single continuous stiffening member connecting its sides at its upper rear edge and having lugs rising therefrom and situated above said member to which the links are attached.

10. A bucket-segment for a clam-shell bucket having hinge-arms secured to the upper edges of its sides, said arms each having a lug rising from its rear end, and a stiffening member secured to and forming a continuous connection between said sides at the upper rear corner of the segment, said member having at each end a forwardly-extended arm, which is secured to the side of the segment, and a lug, which is spaced from but alined with the lug on the adjacent arm, each pair of alined lugs adapted to receive between them and have pivoted thereto one end of a link which connects said segment to the head of the bucket, said forwardly-projecting arms being connected to the body of the stiffening member by bracing or strengthening webs.

11. In a clam-shell bucket, a head having two guide-eyes, two bucket-segments pivotally connected together, links connecting said segments and head, a carrier from which the bucket is supported, an opening and closing rope depending from the carrier passing through one of the guide-eyes and around sheaves carried by the head and bucket-segments respectively, and thence through the other guide-eye back to the carrier, said head having a detachable leader for each guide-eye.

12. In a clam-shell bucket, a head, two bucket-segments pivotally connected together, links connecting said segments and head, and an opening and closing rope, combined with a sheave connected to the head, and a holding-rope passed under said sheave and in a bight of which said bucket is supported, the connection between the sheave and head being such that the head may tip with relation to the sheave in any direction, but the sheave and head are held from relative turning movement about a vertical axis.

13. In a clam-shell bucket, a head, two bucket-segments pivotally connected together and connected to the head, and sheaves in said head over which the opening and closing rope passes, said sheaves each having a rope-receiving groove and ribs secured to the head and entering the grooves of the sheaves.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALMON E. NORRIS.

Witnesses:

LOUIS C. SMITH,  
GEO. W. GREGORY.