

Nov. 26, 1935.

G. W. ALLEN ET AL
HANDLE FOR VACUUM CLEANERS
Filed June 6, 1932

2,021,977

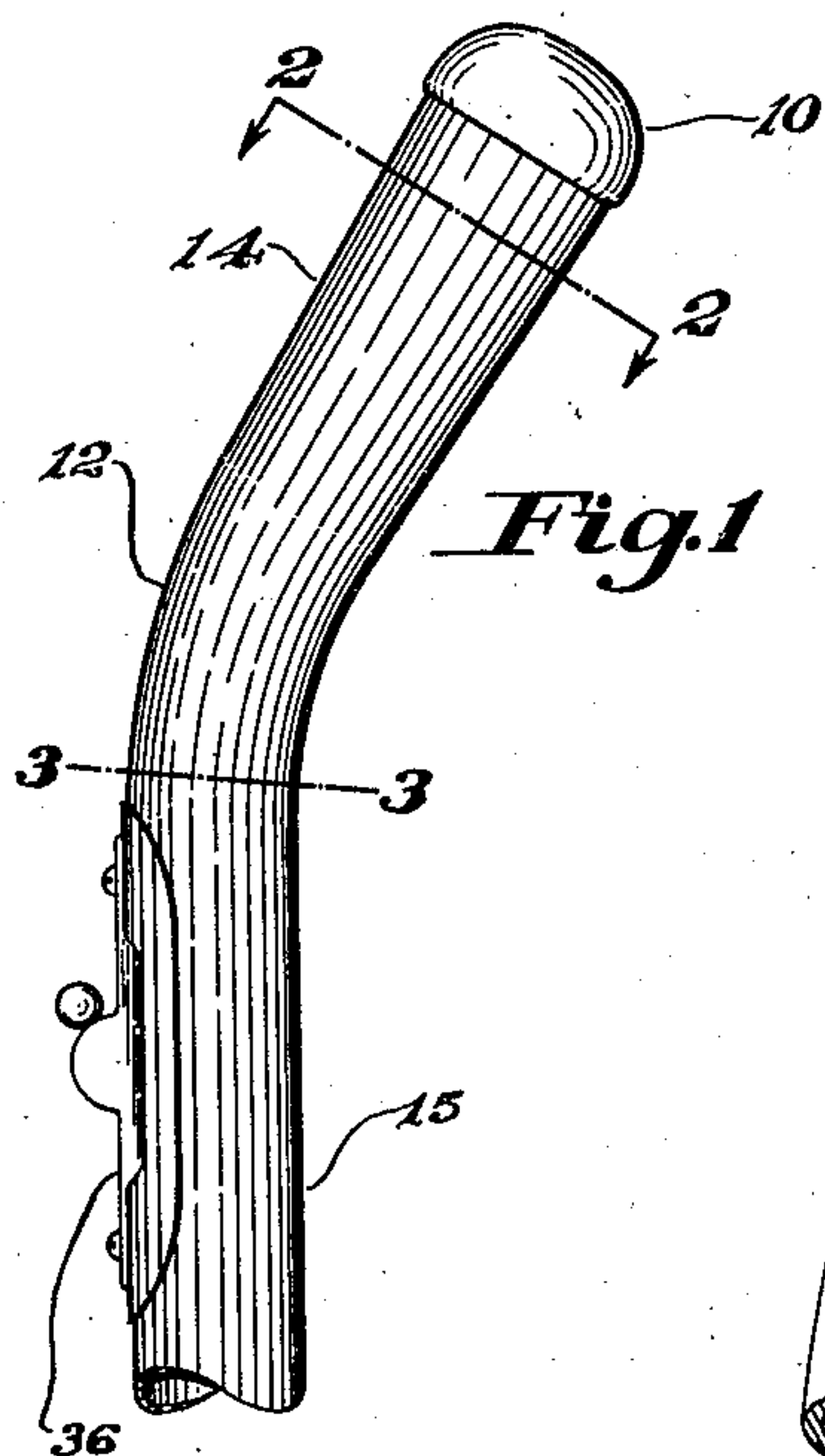


Fig. 1

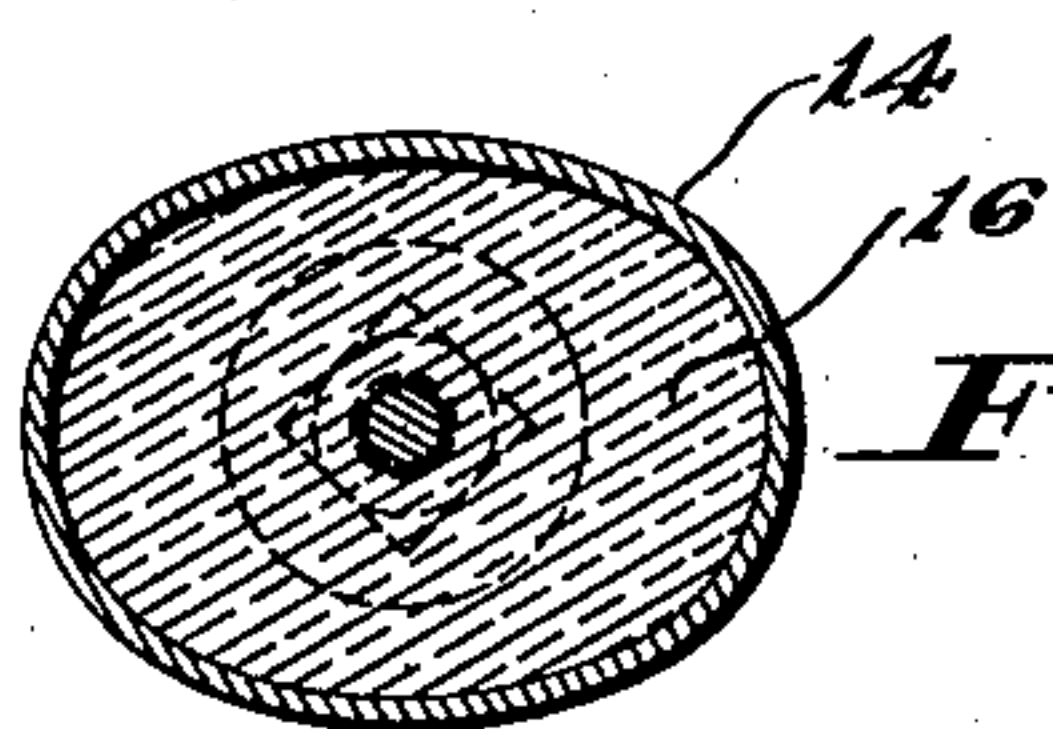


Fig. 2

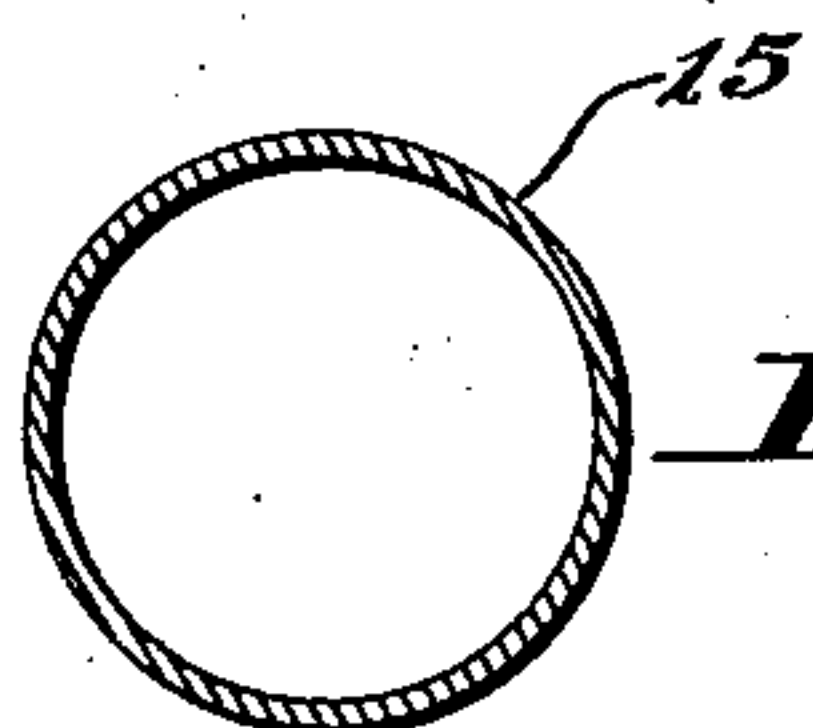


Fig. 3

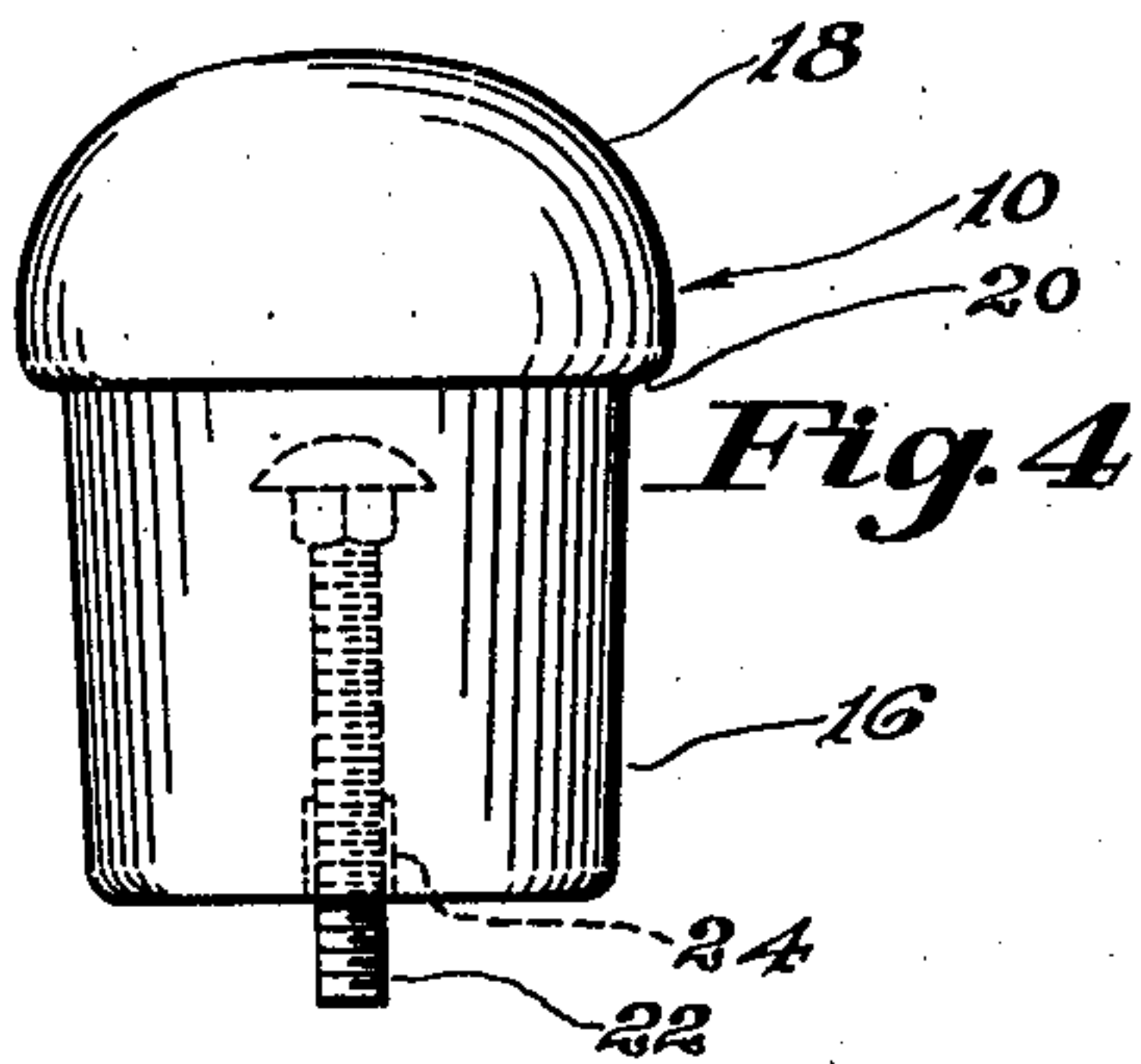


Fig. 4

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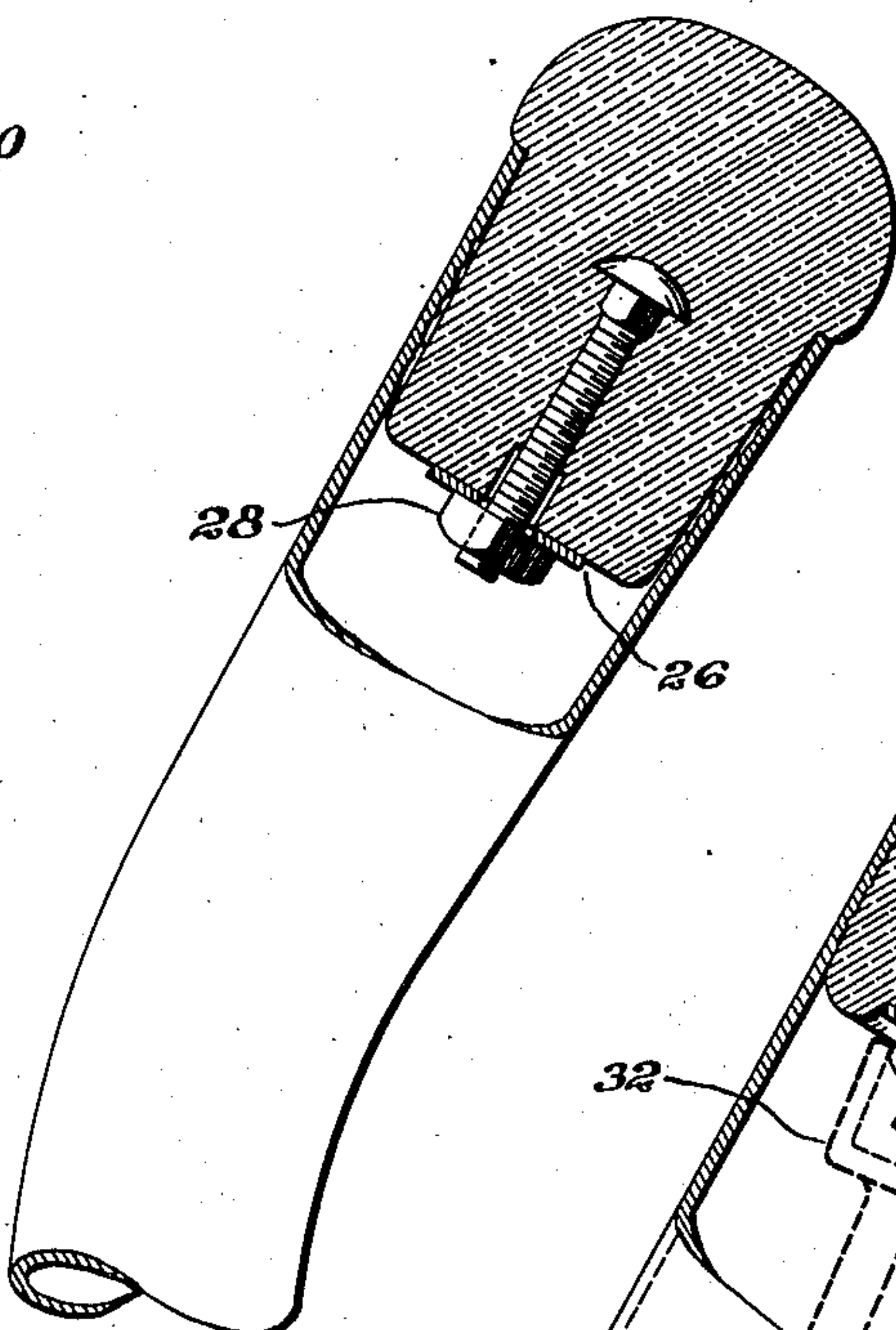


Fig. 6

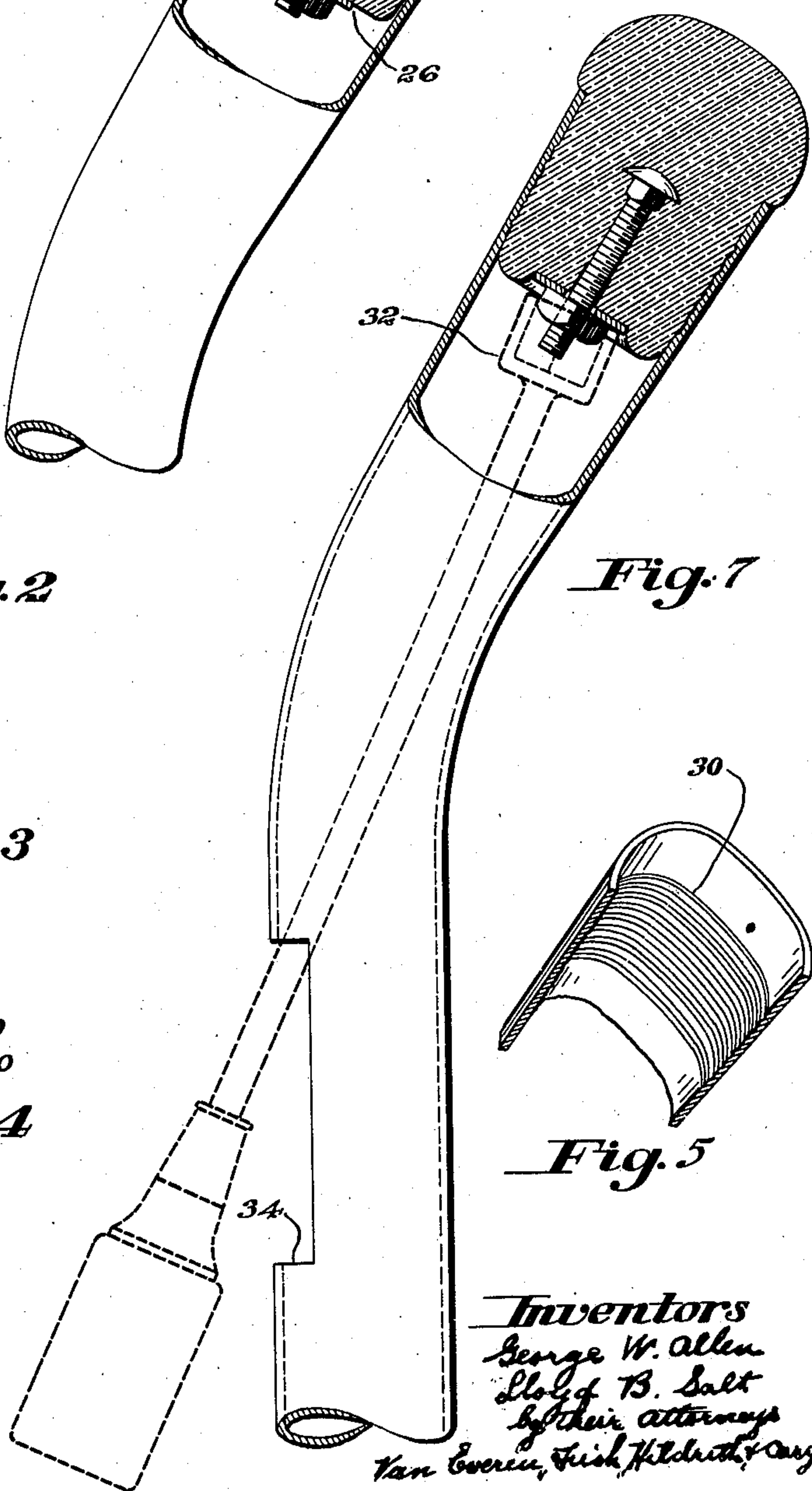


Fig. 7

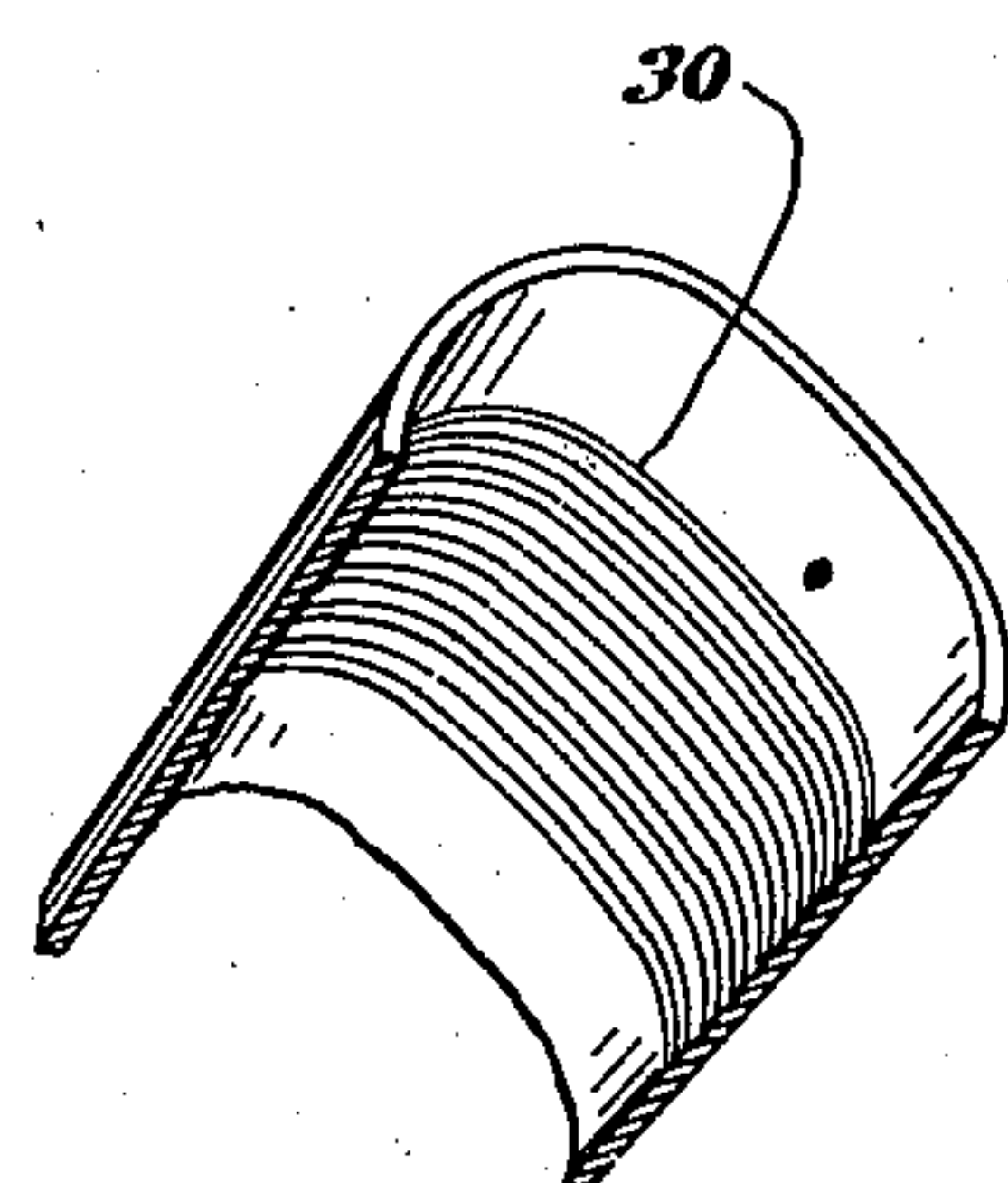


Fig. 5

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UNITED STATES PATENT OFFICE

2,021,977

HANDLE FOR VACUUM CLEANERS

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Application June 6, 1932, Serial No. 615,558

9 Claims. (Cl. 15-143)

The present invention relates to handles for vacuum cleaners and the like and more particularly to end closures for the same.

The handles of vacuum cleaners and the like are commonly constructed from metal tubes, circular in cross-section, with the upper end adjacent the hand of the operator closed by a head or plug. When a plug composed of rubber is used, as is desirable in order to avoid the possibility of the marring of the furniture or interior finish of the house by accidental contact therewith, and the end of the handle is of circular cross-section, no difficulty is experienced in inserting the plug in the end of the handle or in securing it in place. With the external diameter of the proper dimension relative to the internal diameter of the handle, the plug may be positioned in the handle by a torsional or twisting movement of the plug, which results in a reduction in the effective diameter of the plug sufficient to permit it to be inserted the proper distance in the handle. Upon releasing the plug, it tends to assume its original dimensions with the result that it expands against and grips the inner wall of the handle. Sometimes cement or shellac is applied to the interior of the handle or exterior of the plug before assembling in order to secure more permanently the parts together.

While tubular handles of circular cross-section may be satisfactorily closed by such plugs and in such a manner, when the handle end is of elliptical cross-section, which design is now becoming popular, difficulty is found in assembling and securing the plugs in place, for, owing to their elliptical shape, they cannot be forced into the handle with the torsional or twisting movement above described.

It is the object of the present invention to provide an end closure for the grip portion of tubular handles which is comfortable to the hand; which is resilient to prevent the marring of the furniture by accidental contact therewith; which is simple in construction and economical to manufacture; and which may be easily assembled in the handle and securely held in position, irrespective of whether the handle be circular or elliptical or of other cross-sectional shape.

To these ends, the present invention comprises a construction of handle and end closure wherein the closure or plug is of a shape or design corresponding to the interior of the handle and of slightly less dimension or size to permit the ready assembly or positioning of the plug in the end of the handle, means being provided for there-

after expanding the plug within the handle to secure it in place.

In the accompanying drawing, Fig. 1 is an elevation of a portion of a vacuum cleaner handle assembly, showing the end closure in position; Fig. 2 is a transverse section on line 2-2 of Fig. 1 on a larger scale; Fig. 3 is a similar transverse section on line 3-3 of Fig. 1; Fig. 4 is an elevation of the end closure detached; Fig. 5 is a fragmentary view, partly in section, of the end of the handle; Fig. 6 is a longitudinal, sectional elevation of the end of the handle, showing the end closure in place but before it is secured; and Fig. 7 is an elevation, similar to Fig. 6, showing the manner of securing the end closure in place.

In Fig. 1, the end closure 10 is shown attached to a tubular vacuum cleaner handle 12. In the handle illustrated, the grip portion 14 is elliptical in section, as shown by Fig. 2, while the main or upright portion 15 of the tube is circular in section, as indicated by Fig. 3. The grip portion is slightly tapered, so that it merges with the upright portion at the junction thereof and enlarges in cross-section toward the end.

The end closure or plug 10, shown in detail in Fig. 4, is molded or formed of some resilient material, preferably of yielding rubber. The shank portion 16 is elliptical in section, as shown in Fig. 2, and is proportioned so as to fit easily into the end of the tubular handle. The head 18 is semi-ellipsoidal, and forms a shoulder 20 which butts against the end of the tube, as shown in Fig. 6.

The end closure is molded with a threaded compressor member 22, which preferably comprises a carriage bolt, embedded in the plug portion 16. The head and threads of the bolt serve to bond it securely to the rubber. The bond is not formed, however, along the full length of the bolt, a recess 24 being left around the lowermost portion of the bolt in order to provide an end section free from the rubber to facilitate the movement of the nut thereover. The bolt is provided at its free end with a washer 26 and nut 28.

With the nut tightened only sufficiently to prevent dislodgment, the plug portion of the end closure may be easily slipped into the open end of the tubular handle, the inside of which has previously been made rough by shallow annular scores 30, as shown in Fig. 5. The conditions existing immediately after insertion of the plug are as shown in Fig. 6.

To fasten the end closure securely in place, it is necessary to turn the nut 28, thereby longitudinally compressing the plug portion 16 between

the washer 26 and the head of the bolt 22, which will result in a diametrical expansion of the plug portion. This expansion within the tube fills the annular scores 30 and holds the tube and end closure in permanent assembled relation, as shown in Fig. 7.

If a more permanent assembly of closure and handle is desired, cement may be applied to the plug portion or to the interior of the tube before the plug portion is inserted in the tube.

In the particular handle illustrated, the nut 28 may conveniently be tightened by means of a socket wrench 32 introduced into the tube through an opening 34 in the front face of the handle. This opening is intended primarily to receive an electric switch 36, as shown in Fig. 1. If preferred, the nut may be tightened by means of a socket wrench provided with a universal joint, introduced through the lower end of the tube.

The plug or closure above described is of smooth and rounded contour, providing a pleasant appearance and comfortable feeling to the hand of the operator and affording complete protection from contact with the sharp or rough edges or corners of the end of the tube. The compressor member being entirely within the plug and tube, is hidden from sight and out of any possible contact with the operator's hand. The construction is simple, rugged, and inexpensive to manufacture, easily assembled, yet securely held in position.

While the invention, as described and illustrated, is particularly adapted for use with tubes of elliptical section, it is obvious that the same principles may be employed for constructing end closures for tubes having other sections, within the spirit and scope of the present invention.

Having thus described the invention, what is claimed is:

1. A handle for vacuum cleaners and the like comprising a tubular member with an open end section, and a closure of resilient and expansible material for such end section having a portion to fit within the end section of the tubular member and provided with a bolt with the head end embedded in and secured to said portion and its threaded end projecting therefrom and inwardly of the tubular member, said portion being provided with a recess surrounding the inner end of the bolt whereby a portion of the bolt is free from engagement with the closure body, and a washer and nut on the projecting end of the bolt for longitudinally compressing said portion to cause it to expand radially and grip the interior of the end section of the handle.

2. A handle for vacuum cleaners and the like comprising a tubular member having a straight main section and a hand grip end section angularly disposed thereto, said main section being provided with an opening adjacent the hand grip section, and a closure for the end of the hand grip section comprising a plug of resilient expansible material having a portion shaped to fit within the end of the hand grip section and provided with means for longitudinally compressing such portion to produce lateral expansion and cause the same to grip the interior of the hand grip section, the opening in the main section of the tubular member being positioned to permit the passage of a tool therethrough to engage and actuate said compressing means.

3. A handle for vacuum cleaners and the like comprising a tubular member and a closure of resilient and expansible material for the end thereof, said closure comprising a rounded end

portion having an uninterrupted surface and a shank portion of lesser diameter to form a shoulder therebetween, the shank portion being shaped to fit the interior of the end of the tubular member with the shoulder engaging the end of said member, said shank portion being provided with threaded means having one end embedded and held from rotation therein and the other end projecting therefrom and inwardly of the tubular member, and compressing means rotatably mounted on said projecting portion and independent of the tubular member for causing longitudinal compression and lateral expansion of such portion whereby said portion grips the interior of the end of the tubular member.

4. A handle for vacuum cleaners and the like comprising a tubular member having an open end and an opening in the tubular wall, a closure for the open end comprising a plug of resilient expansible material having a portion shaped to fit within the end of the tubular member and provided with a threaded device embedded in and secured to the plug, and means cooperating with the threaded device and accessible from within the tubular member for longitudinally compressing the plug to produce lateral expansion and to cause the same to grip the interior of the tubular member, the opening in the tubular wall being positioned to permit the passage of a tool therethrough to engage and actuate the compressing means.

5. A handle for vacuum cleaners and the like comprising a tubular member with an open end section and a closure therefor of resilient and expansible material, said closure having an outer or exposed portion provided with a continuous surface and an inner portion to fit within the end section of the tubular member with the inner face of such portion out of engagement with the tubular member, the closure being provided with threaded means embedded therein and held from rotation with respect thereto, said means projecting from the inner portion and inwardly of the tubular member, and a nut on the projecting end of said means adapted to be rotated relatively to said means and said closure for compressing the inner portion independently of the tubular member to produce diametrical expansion to cause said portion to grip the interior of the section.

6. A handle for vacuum cleaners and the like comprising a tubular member the end section of which is provided interiorly with a circumferential groove, and an end closure of resilient and expansible material comprising an outer or exposed portion having an uninterrupted end surface and an inner portion to fit within the end section of the tubular member with the inner face of such portion out of engagement with the tubular member, and means embedded in and secured to said closure for compressing the inner section thereof independently of the tubular member to expand the same laterally to cause it to enter the groove and hold the closure securely in position.

7. An end closure for vacuum cleaner handles and the like comprising a body portion of resilient and expansible material and having a rounded head portion with a continuous surface and a shank portion projecting therefrom with a shoulder therebetween, a member having a head embedded in and wholly enclosed by the body and secured thereto, and an end projecting from the end of the shank portion of the body, and means movably mounted on the said end for engaging directly with the end of the shank portion for

compressing the shank portion longitudinally to cause it to expand laterally.

8. A handle for vacuum cleaners and the like comprising a tubular member the end section of which is elliptical in cross-section and tapering outwardly toward the end to form a hand grip, and a closure for the open end of said section, the closure consisting of resilient and expansible material, having an outer or exposed rounded end portion provided with a continuous surface, and an inner portion to fit within the end section of the tubular member, and means carried by the closure and accessible from the interior of the tubular member and operating directly upon the inner portion and independently of the tubular member for compressing the inner portion to expand the same laterally and to cause it to grip the interior of the end section.

9. A handle for vacuum cleaners and the like comprising a tubular member with an open end section and a closure therefor of resilient and expansible material, the closure having an outer or exposed portion provided with a continuous surface and an inner portion to fit within the end portion of the tubular member with the inner face of such portion out of engagement with the tubular member, the closure being provided with means embedded therein and accessible only from the interior of the tubular member for compressing the inner portion of the closure to expand the same laterally to cause it to grip the interior of the end section.

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