

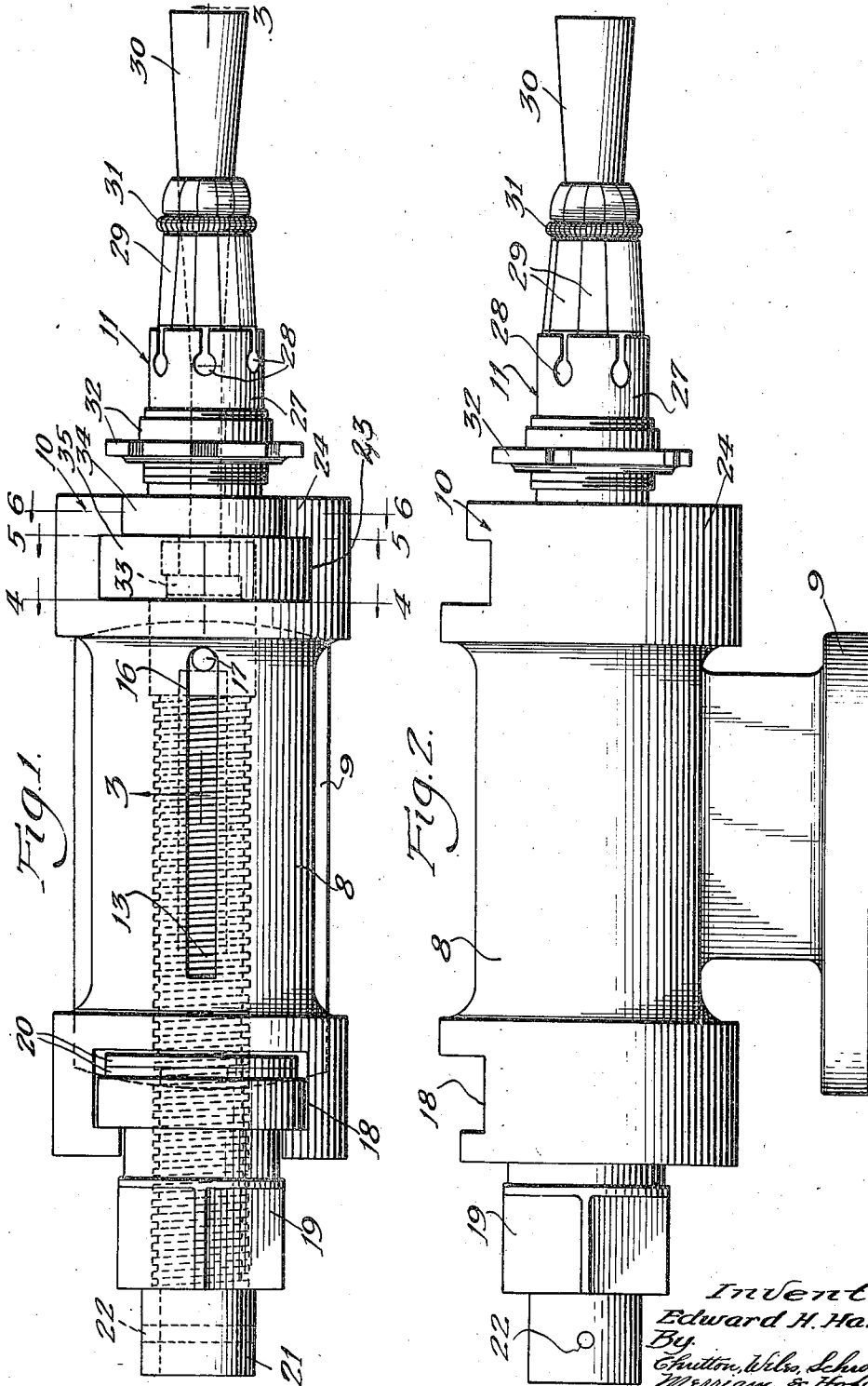
July 6, 1948.

E. H. HANSEN
READILY DETACHABLE EXPANDER IN APPARATUS
FOR ATTACHING COUPLINGS TO HOSE

2,444,601

Filed Nov. 27, 1944

2 Sheets-Sheet 1



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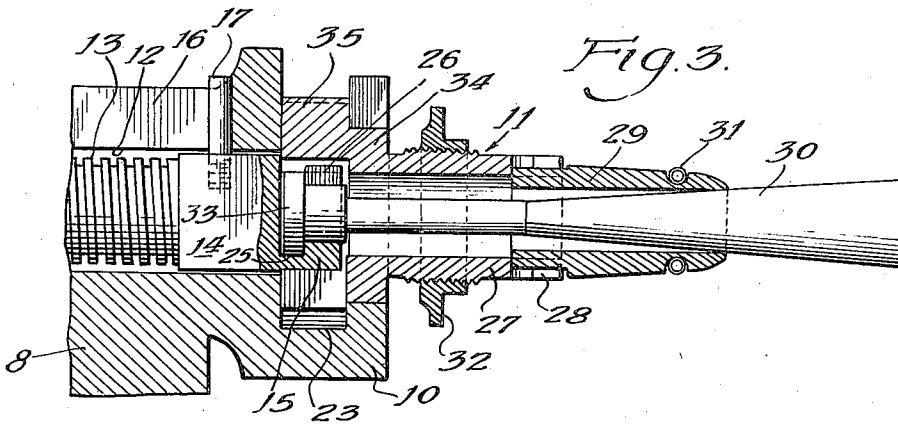


Fig. 3.

Fig. 4.

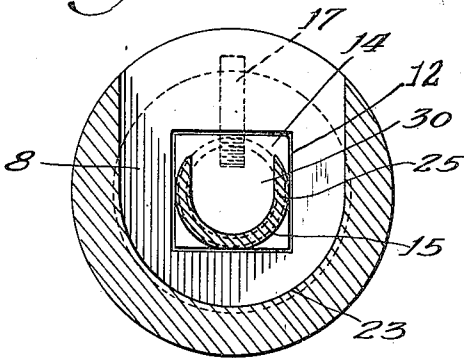


Fig. 5.

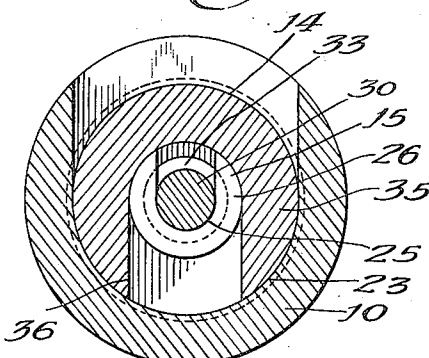


Fig. 6.

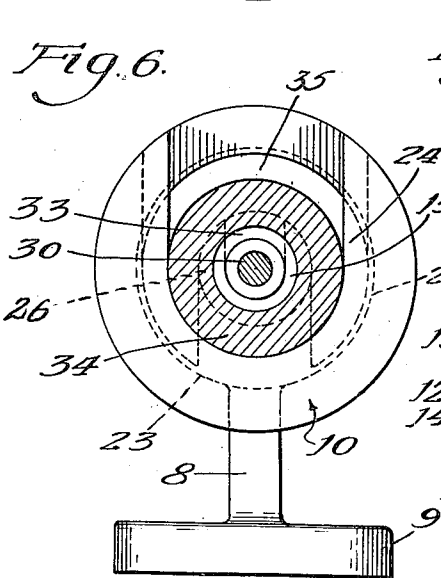
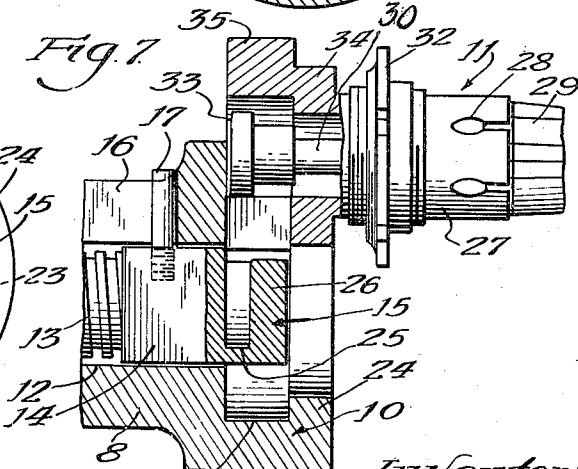


Fig. 7.



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UNITED STATES PATENT OFFICE

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READILY DETACHABLE EXPANDER IN APPARATUS FOR ATTACHING COUPLINGS TO HOSE

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4 Claims. (Cl. 153—80)

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This invention relates to apparatus for attaching hose couplings to hose, and more particularly to apparatus adapted to handle couplings of various diameters.

The primary object of the invention is to provide an improved machine for operating an expanding mandrel wherein one size of mandrel may be removed easily and quickly, without any tools, and another slipped into its place.

The conventional way of attaching a coupling to the end of a piece of hose, such as a fire hose, is to place a brass ring, of proper size, on an expandable mandrel, slip the hose over the ring, slide a metal coupler over the hose and inner ring, and then stretch the inner ring into clamping engagement with the hose by expanding the inner ring by means of the mandrel. Heretofore, it was necessary to have a separate machine for each size of hose. By the present invention different size detachable mandrels may be operated by the same draw-screw apparatus.

The invention is illustrated in a preferred embodiment, in the accompanying drawings in which—

Figure 1 is a plan view of the complete apparatus embodying the invention; Fig. 2, an elevational view of the same; Fig. 3, a fragmentary vertical sectional view showing how the expanding mandrel is attached taken as indicated at line 3—3 of Fig. 1; Fig. 4, a vertical sectional view taken as indicated at line 4—4 of Fig. 1; Fig. 5, a vertical sectional view taken as indicated at line 5—5 of Fig. 1; Fig. 6, a vertical sectional view taken as indicated at line 6—6 of Fig. 1; and Fig. 7, a fragmentary elevational view, partly in section, showing the expansion unit being slipped into operative position.

In the embodiment illustrated, a stand 8 is provided with a base 9 which may be bolted to a bench. The stand is provided at one end with a connecting joint or chuck 10, to support a detachable expansion unit 11. The stand is provided with a long square aperture 12, to receive a traveling draw-screw 13. The screw is provided at one end with a square head 14 carrying a small coupling joint 15 which is movable into the chuck 10. The upper side of the stand has a longitudinally extending slot 16. A stud 17 is fixed to the head 14, so as to project through the slot and indicate the position of the draw-screw in the stand. When the stud 17 is in the extreme right end position, indicated in the various figures, the coupling joint 15 on the screw is in position to receive the expansion unit.

The other end of the stand 8 has an upwardly

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open socket portion 18, to receive a nut 19 on the screw. The nut may be rotated by means of a wheel or crank (not shown) to cause the draw-screw to move back and forth in the stand. A pair of brass thrust washers 20 are shown in the socket 18, and the draw-screw is provided at its end with a collar 21, which is held by a shear pin 22, to limit the inner travel of the screw.

The coupling joint or chuck 10 has a semi-circular upwardly open socket 23 with a U-shaped flange 24 at its right end, as viewed in Fig. 1. In like manner, the small coupling joint 15 on the draw-screw 13 has an upwardly open semi-circular socket portion 25 and a U-shaped flange 26.

Each of the expansion units 11 has a circular body portion 27 provided with keyhole-shaped radial slots 28, to serve as guides for the ends of segments 29, which are held together and are urged inwardly towards a tapered mandrel 30, by means of an annular spring 31. A guide ring 32 for a hose is threaded to the member 27, and may be adjusted to regulate the position of the parts which are placed on the mandrel while a coupling is being attached.

The inner end of the mandrel 30 has an enlarged head 33, which is adapted to slip down into the socket 25 on the draw-screw and couple those parts together. The body member 27, in like manner, has an enlarged head 34 affording a flange 35, adapted to slip into the socket 23 on the stand. The lower portion of the flange is cut away as indicated at 36, so that it may slip over the joint on the draw-screw and permit the head of the mandrel to be gripped by the draw-screw. When the parts have been brought into engaging position the expansion unit may be partially rotated to lock the head 34 in the socket. The unit may be operated satisfactorily, however, without being locked but the lock serves to prevent accidental displacement of the expansion unit.

The operation of the device will be readily understood. The nut 19 is turned until the indicator 17 reaches the end of the slot 16, as indicated in Fig. 1. This will bring the coupling joint on the end of the draw-screw into coupling position. The end of the head 33 on the mandrel is then lined up with the end of the head 35, and with the open portion 36 turned downwardly, the expansion unit is slipped down into the position shown in Fig. 3, and given a partial turn. This couples the mandrel to the draw-screw, and the expansion unit is firmly held by its head engaging the chuck on the stand. The clamping ring,

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not shown, is then slipped over the segments 29, a hose is slipped over the free end of the expansion unit up to the guide ring 32, and the hose coupling is slipped over the hose into contact with the flange on the ring 32. By turning the nut 19, the mandrel 30 is drawn inwardly with great force, and causes the segments 29 to stretch the clamping ring permanently into engagement with the hose. The draw-screw is then returned by means of the nut to the starting position shown in Fig. 1, and the hose with its coupling may be removed. If the next hose to be operated upon is of a different size, a different expansion unit may be slipped into position without the aid of any tool.

The foregoing detailed description is given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, for some modifications will be obvious to those skilled in the art.

I claim:

1. A device of the character described, comprising: an elongated stand having a hole extending longitudinally therethrough; a draw screw axially slidable in said hole; cooperating means on said stand and said draw screw to prevent rotation of the screw without interfering with sliding movement thereof; an expanding unit disposed adjacent to one end of the stand including a tubular member, and a tapered mandrel inside the tubular member and movable axially with respect thereto; an enlarged head on one extremity of the tubular member adjacent to said end of the stand; means for readily detachably holding the expanding unit in an operative position axially aligned with the draw screw comprising a substantially U-shaped flange on said end of the stand projecting beneath and behind said enlarged head of the tubular member and cooperating with the adjacent end of the stand to define a socket in which the enlarged head is received with the socket opening laterally to the side of the stand to enable the enlarged head on the tubular member to be passed sidewise therethrough for disassembly of the expanding unit from the stand; a driving connection between the mandrel and the draw screw established with the end portion of the draw screw inside said socket by sidewise movement of the expanding unit to its operative position, and by which axial movement of the draw screw is translated into a corresponding axial motion of the mandrel; said enlarged head having a substantially radial slot to enable the head to pass freely over said end portion of the draw screw during assembly and disassembly of the expanding unit with relation to the stand; and means threaded on the draw screw and reacting against a portion of the stand remote from the expanding unit for effecting axial motion of the draw screw in a direction to carry the mandrel into spreading relationship with a part encircling the same.

2. A device of the character described, comprising: an elongated stand having a hole extending longitudinally therethrough; an expanding unit disposed adjacent to one end of the stand and including a tubular element aligning axially with said hole in the stand and a tapered mandrel slidable axially inside the tubular element; an enlarged head on the end of the tubular element adjacent to the stand; means on the stand defining a laterally open socket to readily detachably receive said enlarged head of the tubular member and hold the expanding unit in an operative axially aligned position with re-

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spect to said hole in the stand and connected with the stand against axial motion relative thereto while permitting rotation of the head in the socket, said connection between said stand and the enlarged head being established by sidewise movement of the expanding unit relative to the stand in a path normal to the axis of said hole therein to seat the enlarged head in said socket; a draw screw slidable axially in said hole in the stand to and from a position with one end portion thereof disposed inside said socket; said head having a substantially radial slot therein to accommodate said end portion of the draw screw during assembly of the expanding unit to its operative position and whereby slight rotation of the tubular member relative to the stand to bring the unslotted portion of the head beneath said end portion of the draw screw locks the expanding unit in its operative position against accidental displacement from the stand; a readily detachable connection between said end portion of the draw screw and the mandrel established by sidewise assembling motion of the expanding unit to its operative position and by which the mandrel is driven axially by the draw screw; cooperating means on the stand and the screw for preventing rotation of the screw in its hole; and a nut threaded on the screw and reacting against a portion of the stand for translating rotation of the nut into axial movement of the draw screw and mandrel in a direction to effect expansion of a ring encircling the mandrel.

3. A device of the character described comprising: an elongated stand having a hole extending longitudinally therethrough; an expanding unit disposed adjacent to one end of the stand and including a tubular element aligning axially with said hole in the stand, and a tapered mandrel slidable axially inside the tubular element; an enlarged head on the end of the tubular element adjacent to the stand; means holding the expanding unit in an operative axially aligned position with respect to the stand but against axial motion relative thereto comprising a readily detachable connection between said stand and the enlarged head on the tubular member established by sidewise movement of the expanding unit in a path normal to the axis of said hole in the stand to bring the expanding unit into axial alignment with said hole; a draw screw slidable axially in said hole to and from a normally inactive position with one end portion thereof projected into said enlarged head, said head having a substantially radial slot therein to accommodate the screw during motion of the expanding unit to and from its operative position; a readily detachable driving connection between the mandrel and said end portion of the draw screw established when the draw screw is in said normally inactive position by sidewise motion of the expanding unit to its operative position, and by which axial movement of the draw screw is imparted to the mandrel; cooperating means on the stand and the draw screw for preventing rotation of the screw in said hole; and a nut threaded on said screw and reacting against a portion of the stand for translating rotation of the nut into axial movement of the draw screw and mandrel in a direction to effect expansion of a ring encircling the mandrel.

4. Apparatus for attaching couplings to hose by means of axial movement of a tapered mandrel in consequence to relative rotation between cooperating screw threaded parts carried by a supporting stand, characterized by the provision

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of a readily detachable connection between the mandrel and one of said screw threaded parts established by bodily movement of the mandrel in a path normal to the axis of said screw threaded part and by which connection the mandrel is operated axially as a result of relative rotation between the screw threaded parts; and further characterized by the provision of a holder for the mandrel encircling at least a part of the same for holding the mandrel operatively associated with said screw threaded part connected thereto, and a readily detachable connection between said holder and the supporting stand effected concomitantly with the establishment of the driving connection between the mandrel and said screw threaded part.

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