

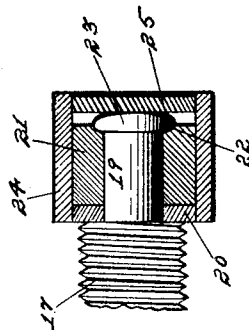
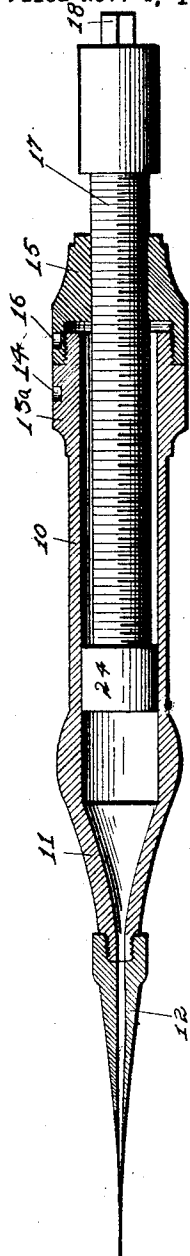
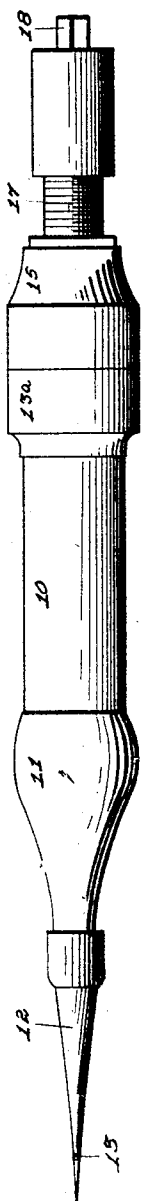
Oct. 6, 1925.

1,556,085

H. H. DE PEW

SURGICAL INSTRUMENT

Filed Nov. 4, 1922



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UNITED STATES PATENT OFFICE.

HENRY H. DE PEW, OF DES MOINES, IOWA.

SURGICAL INSTRUMENT.

Application filed November 4, 1922. Serial No. 599,020.

To all whom it may concern:

Be it known that I, HENRY H. DE PEW, a citizen of the United States, and a resident of Des Moines, in the county of Polk, State of Iowa, have invented a certain new and useful Surgical Instrument, of which the following is a specification.

The object of my invention is to provide a surgical instrument of simple, durable and inexpensive construction especially adapted for use in the treatment of abdominal ruptures or for similar purposes, and whereby a surgeon may employ the instrument in forming a retaining wall of paraffin or similar material under the skin and between the muscles and other tissues of the abdominal wall, in such manner as to permanently reinforce, strengthen and protect the abdominal wall, and thus obviate the necessity of external trusses, bandages and the like.

More specifically it is my object to provide a cylinder to receive the paraffin and a screw actuated piston fitted to the cylinder for forcing out the paraffin under high pressure, which piston is of simple and inexpensive construction and so arranged that after being assembled, its parts cannot be detached or loosened, and at the same time the piston is free to revolve upon the screw threaded shaft with a minimum of friction; and

Further to provide a piston of this character through which none of the paraffin can be forced, and also provide a piston through which none of the lubricant applied to the screw can enter or come in contact with the face of the piston adjacent to the paraffin or the adjacent walls of the paraffin containing cylinder.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claim, and illustrated in the accompanying drawings, in which:

Figure 1 shows a side elevation of a surgical instrument embodying my invention.

Figure 2 shows a central, longitudinal, sectional view of the same; and

Figure 3 shows an enlarged, detail, longitudinal, sectional view of the piston and its supporting screw shaft.

Referring to the accompanying drawings I have used the reference numeral 10 to indicate a cylinder body portion having a

smooth internal wall designed to receive paraffin and the like. At one end the cylinder is tapered at 11 and provided with an external screw thread designed to receive a surgical needle 12 having a small passage-way through it and a discharge opening 13 at its outer end portion.

At the opposite end of the cylinder 10 there is an enlarged portion 13^a in which there is formed a small opening 14 and a cylinder head 15 is screwed to the end of the cylinder, and is also provided with an opening 16. These openings 14 and 16 are for the purpose of receiving a holding tool which forms no part of my present invention. The interior of the cylinder head 15 is screw threaded.

Extended through the cylinder head 15 is the screw threaded shaft 17 having an angular extension 18 at one end to receive a tool for rotating the shaft. The end of the screw threaded shaft opposite from the part 18 is formed with a reduced rounded portion 19.

In forming the piston, I first place on the end 19 of the shaft 17 a metal disk 20 slightly larger in diameter than the screw threaded shaft. I then place on the end 19 a metal ring 21 having an annular recess formed around its central opening at 22. I then form a head 23 on the end 19 by an ordinary riveting process, thereby causing the head 23 to enter the annular recess 22 and to firmly and securely hold the ring 21 on the part 19. In this connection the outer surface of the head 23 is preferably formed of a rounded contour, as shown in Figure 3. After the head 23 has been formed I then place a cylindrical piston member 24, open at both ends, in position extended over the disk 20, the ring 21 and beyond the head 23. I then provide a solid metal disk 25 and place it against the head 23 and within the end of the cylinder 24, and after this has been done I firmly unite the cylinder 24 with both the disk 20 and the disk 25 by a brazing or soldering process.

When permanently securing the disk 25 to the cylinder 24 I am careful to cause the disk 25 to lightly engage the head 23 so that the screw may freely revolve within the piston.

In practical use I first move the threaded shaft 17 to position with the piston adjacent to the piston head. I then remove the piston head from the cylinder 10. I then fill the cylinder 10 with sterilized paraffin or

other suitable material. I then replace the piston head upon the cylinder and apply the surgical needle to the discharge end of the instrument. Then by holding the cylinder
5 10 in a stationary position and rotating the screw threaded shaft, the piston is slowly and forcibly advanced against the paraffin and a small thread of paraffin is forcibly ejected from the cylinder.

10 On account of the nature of the paraffin, it requires relatively high pressure as applied to the piston for forcing the paraffin from the instrument, and it is very essential that during the movement of the screw
15 threaded shaft, the piston should not revolve within the cylinder, as otherwise it would operate disadvantageously upon the paraffin. Therefore, under such high pressure the piston must be relatively free to
20 revolve upon the shaft.

Furthermore, it is desirable in that none of the lubricant used upon the screw shaft is ever permitted to pass to the outer or working face of the piston.

25 I have found in use that by means of my improved piston construction, the device may be manufactured at a minimum of expense, for the reason that during the time that the head 23 is being formed on the end
30 of the screw shaft, no particular care is necessary in forming the head, because neither the smooth outer cylinder portion of the piston nor the disk 25 are present. When
35 the riveting of the head 25 has been completed, then it is only necessary to see that the disk 20 is free to revolve between the ring 21 and the adjacent shoulder on the shaft 17, and it is immaterial whether the
40 ring 21 may rotate or not.

The cylinder piston body 24 may be accurately shaped and proportioned on a suit-

able lathe, and accurately fitted to the outer surface of the disk 20, which may also be accurately formed on a lathe, and it is immaterial whether the cylinder 24 accurately
45 fits the ring 21 or not. The disk 25 may then be placed in position resting lightly against the head 23 regardless of the exact shape, size and contour of the head, because it may be extended more or less into the
50 adjacent end of the cylinder 24.

After the parts have thus been fitted together in such a manner as to permit the screw to turn freely within the piston, then the disks 20 and 25 may be brazed or other-
55 wise permanently secured in position, and after this work has been completed, none of the pressures or uses to which the instrument is subjected will in any way effect the relationship of the piston relative to the
60 screw shaft, and yet at all times the shaft will freely turn within the piston.

I claim as my invention:

In an instrument of the class described, a piston designed to be advanced through a
65 cylinder by a screw like movement for forcibly ejecting material from the cylinder, comprising a shaft formed with a shoulder and a reduced extension beyond the shoulder, a disk rotatably mounted on the extension
70 and engaging the shoulder, a ring mounted upon the extension and engaging the disk, a head formed on the extension and engaging said ring, a disk shaped piston end member engaging said head, and a cy-
75 lindrical piston body portion enclosing said disks and ring and fixedly connected to both disks and rotatable relative to said ring, for the purposes stated.

Des Moines, Iowa, October 7, 1922.

HENRY H. DE PEW.