

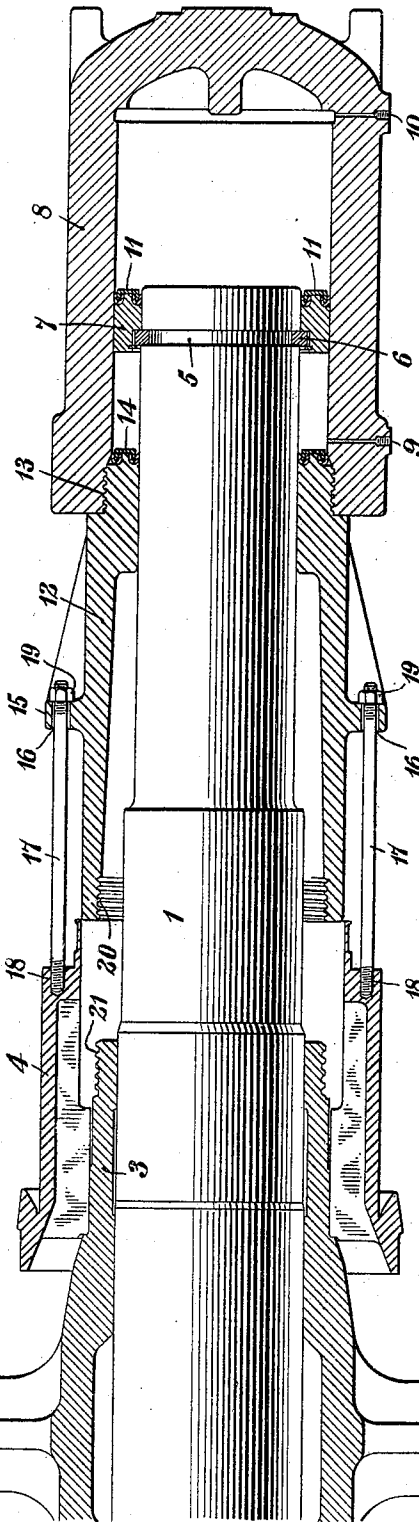
T. S. SCOTT.  
 FLUID PRESSURE APPLIANCE.  
 APPLICATION FILED DEC. 14, 1908.

975,467.

Patented Nov. 15, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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*R. J. Carbone*

INVENTOR

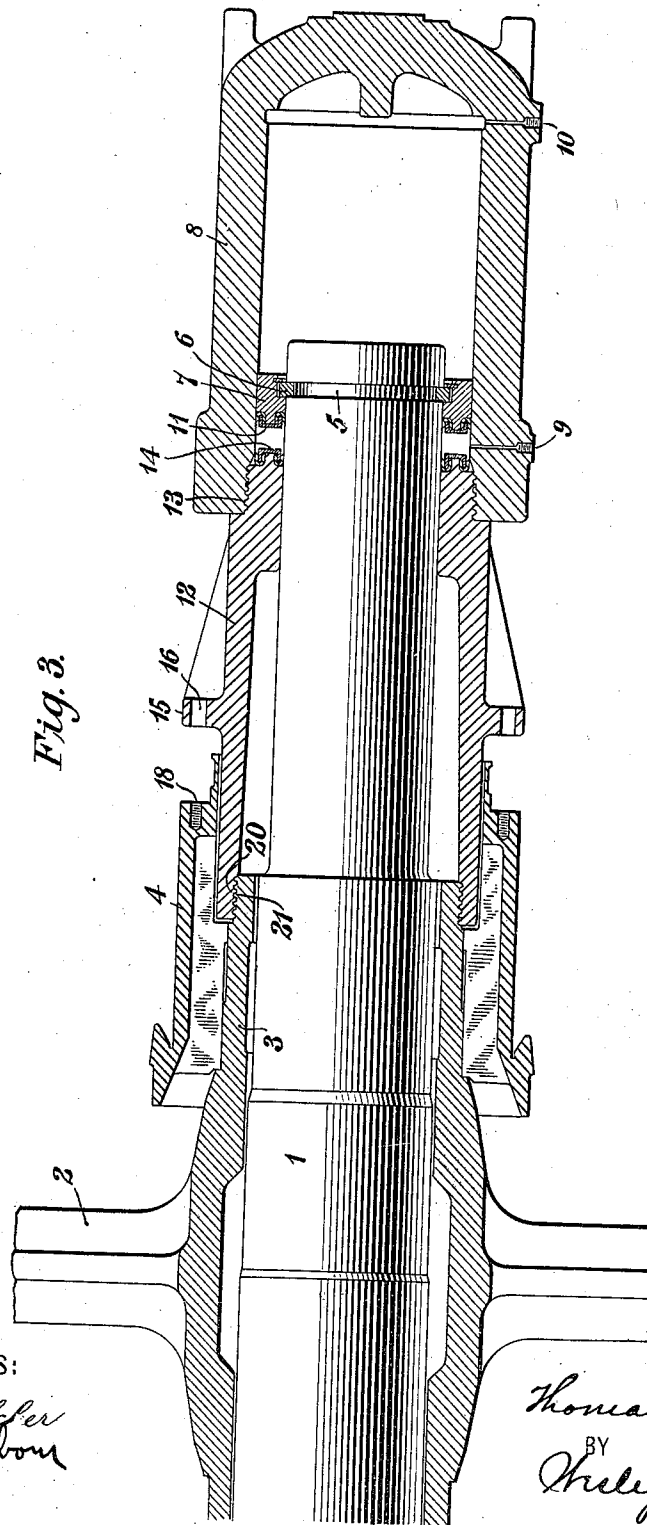
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# UNITED STATES PATENT OFFICE.

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## FLUID-PRESSURE APPLIANCE.

975,467.

Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed December 14, 1908. Serial No. 467,462.

*To all whom it may concern:*

Be it known that I, THOMAS S. SCOTT, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Fluid-Pressure Appliances, of which the following is a specification.

My invention relates to means for pressing armature and commutator spiders upon their supporting shafts and for removing said members, when desired.

The object of my invention is to provide a simple, compact and portable means for doing the work above specified in an expeditious and effective manner.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my invention as utilized for removing a commutator spider from its support. Fig. 2 is a view similar to Fig. 1 but showing my invention as utilized for removing an armature spider from its shaft. Fig. 3 is a view similar to Figs. 1 and 2 but showing my invention as utilized for forcing an armature and a commutator spider into their normal operating positions upon their shaft.

It is a common practice to press armature and commutator spiders upon their supporting shafts, and heavy, complicated machinery is ordinarily required for this purpose.

It sometimes occurs that removal of an armature or a commutator cylinder is desired, by reason of some injury to the one or other of said parts, and, since the shaft of a large electrical machine is an expensive member, it may be desirable to hold a spare armature and a spare commutator cylinder in reserve to substitute for those regularly in use, without replacing the shaft. Under such conditions, it is desirable to be able to utilize some readily available means for removing the injured parts, and replacing them, in an expeditious and effective manner, by the spare parts which are kept in reserve.

My present invention is designed to meet the conditions above set forth, and it may also, of course, be utilized for placing armature and commutator spiders in position upon their supporting shaft when the parts of the machine are initially assembled, as well as when they are in need of repair or replacement.

Referring now particularly to Fig. 1 of the drawings, the shaft 1 may be of the usual form having different portions of its length of different diameters in order to facilitate the assembling of the parts which it is to support, and, on the portion of the shaft having the largest diameter is mounted an armature spider 2, only a portion of which is shown in the drawings, it being understood that this spider has been forced to the position which it occupies by means of pressure applied in the usual, or in any convenient, manner.

Mounted upon one end of the sleeve extension 3 of the spider 2 is a spider 4 for supporting commutator segments (not shown) this commutator spider 4 having also been placed in position by means of suitably applied pressure.

The shaft 1 is provided, adjacent to its end, with an annular groove 5, in which is located a ring 6 of such thickness as to project beyond the periphery of the shaft in order to serve as an abutment for an annular piston 7. Surrounding the piston 7 and the end of the shaft is a cylinder 8 having inlet ports 9 and 10 adjacent to its respective ends, suitable packing 11 being interposed between the inside of the cylinder 8 and the annular piston 7 and between the latter and the shaft in order to make a fluid-tight joint between the said parts.

Surrounding the shaft, between the commutator and armature spiders and the cylinder 8, is a sleeve 12, the outer end of which makes a fairly close fit upon the shaft and is attached to the adjacent end of the cylinder by a screw joint 13, suitable packing means 14 being provided between the end of the sleeve and the shaft and between it and the inner surface of the cylinder, though such means is not utilized in performing the work for which the arrangement shown in Fig. 1 is intended. The sleeve 12 is provided with a flange or lugs 15 intermediate its ends having holes 16 to receive rods 17, the inner ends of which are screwed into suitable holes 18 in the outer end of the commutator spider and the outer ends of which are provided with nuts 19 to engage the flange or lugs 15. The inner end of the sleeve 12 is provided with an internal screw thread 20 which is adapted to engage a corresponding external screw thread 21 on the outer end of the ar-

mature spider extension 3 for certain operations to be hereinafter described but having no function in the operation of removing the commutator spider.

5 Assuming that the parts are in the positions shown in the drawing, suitable fluid, such, for example, as oil, is introduced into the port 10 under such pressure as may be necessary to effect movement of the parts  
10 and, as such pressure is exerted oppositely against the outer end of the cylinder and against the end of the shaft and the ring piston 7, it will tend to force the said parts in opposite directions, and if the pressure is  
15 sufficient and the shaft is held stationary, obviously, the movement of the cylinder outwardly will act through the sleeve 12 and the rods 17 to withdraw the commutator spider from the sleeve extension of the armature spider, on which it is mounted.  
20

Referring now to Fig. 2 of the drawings, the parts here shown, which are also shown in Fig. 1, will not again be described except in so far as such description is incidental to  
25 that of the additional parts here shown. The means here illustrated is intended to be utilized for removing the armature spider 2 from the shaft 1 and, for this purpose, the groove 5 near the end of the shaft, the ring  
30 6 and the annular piston 7, its packing means 11 and the cylinder 8 are utilized in the same way and the fluid pressure is introduced through the same port as in the combination shown in Fig. 1, but, in this case, a heavy  
35 block 22 is fitted against the outer end of the piston 8 and is connected to the arms of the armature spider by means of rods or bolts 23, the outer ends of which are provided with nuts 24 for clamping the blocks securely to the outer end of the cylinder.  
40

When fluid, under requisite pressure, is introduced through the port 10, the cylinder will be forced outwardly away from the end of the shaft and will carry with it the block  
45 22 and, by reason of the bolts or rods 23 extending therefrom to the armature spider, the latter will be drawn from its position on the shaft.

Referring now to Fig. 3 of the drawings, the parts here shown are substantially the same as those illustrated in Fig. 1 except that the rods 17 are not utilized and the sleeve 12 is joined to the sleeve extension 3 of the armature spider by means of the  
50 screw threads 20 and 21. In this case, also, the ring piston 7 is reversed in position with reference to the ring 6 and the fluid pressure

is applied between the ring piston and the outer end of the sleeve 12 through the port 9.

It will be readily seen that, if the fluid  
60 pressure applied within the chamber between the ring piston and the outer end of the sleeve is sufficient in amount, the sleeve and the armature spider will be forced along the shaft until the spider is seated in proper  
65 position for operating conditions.

It will be understood that minor changes in form, dimensions and relations of parts may be made within the scope of my invention.  
70

I claim as my invention:

1. The combination with a shaft, and an annular piston mounted immovably upon one end thereof, of a cylinder for said piston having a fluid-inlet port and means for connecting said cylinder to a part to be moved along said shaft.  
75

2. The combination with a shaft having an annular groove near one end, a ring in said groove, and an annular piston surrounding said shaft and engaging said ring, of a cylinder for said piston having a fluid-inlet port, and means for connecting said piston to a part to be moved along said shaft.  
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3. The combination with a shaft, an annular piston surrounding said shaft near one end thereof and means for locking said piston against movement along the shaft, of a cylinder for said piston having a fluid-inlet port, and means for connecting said cylinder to a part to be moved along the shaft.  
85 90

4. The combination with a shaft and an annular piston fastened to one end thereof, of a cylinder for said piston having a fluid-inlet port, a sleeve fitted to said shaft and fastened to one end of the cylinder and to a member which is to be moved along the shaft.  
95

5. The combination with a shaft and an annular piston attached to one end thereof, a cylinder for said piston having a fluid-inlet port adjacent to each of its ends, and means for connecting the cylinder to a shaft-supported member in order to force it to operative position or to withdraw it therefrom.  
100 105

In testimony whereof, I have hereunto subscribed my name this 30th day of November, 1908.

THOS. S. SCOTT.

Witnesses:

F. C. HALL,  
BIRNEY HINES.