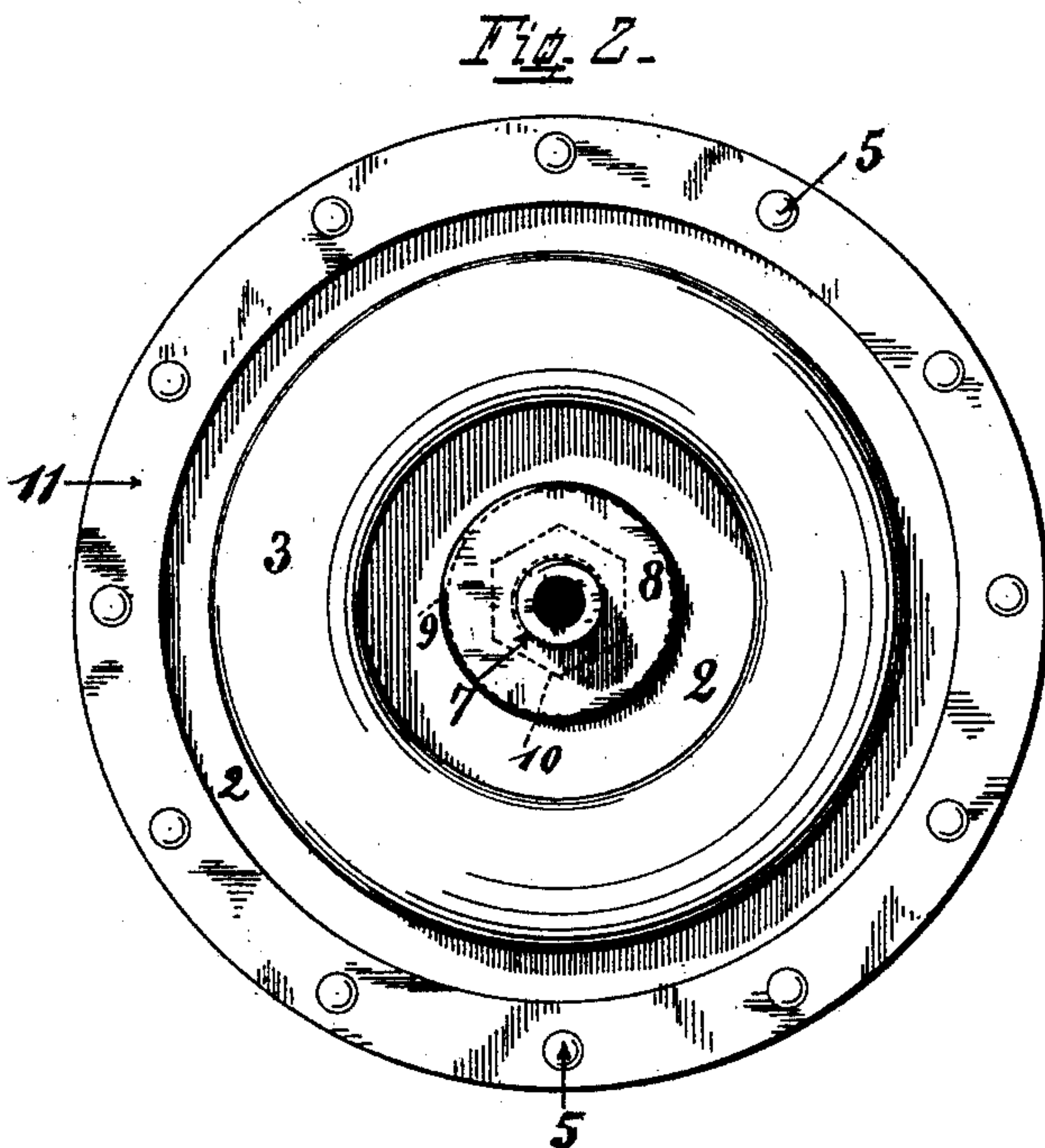
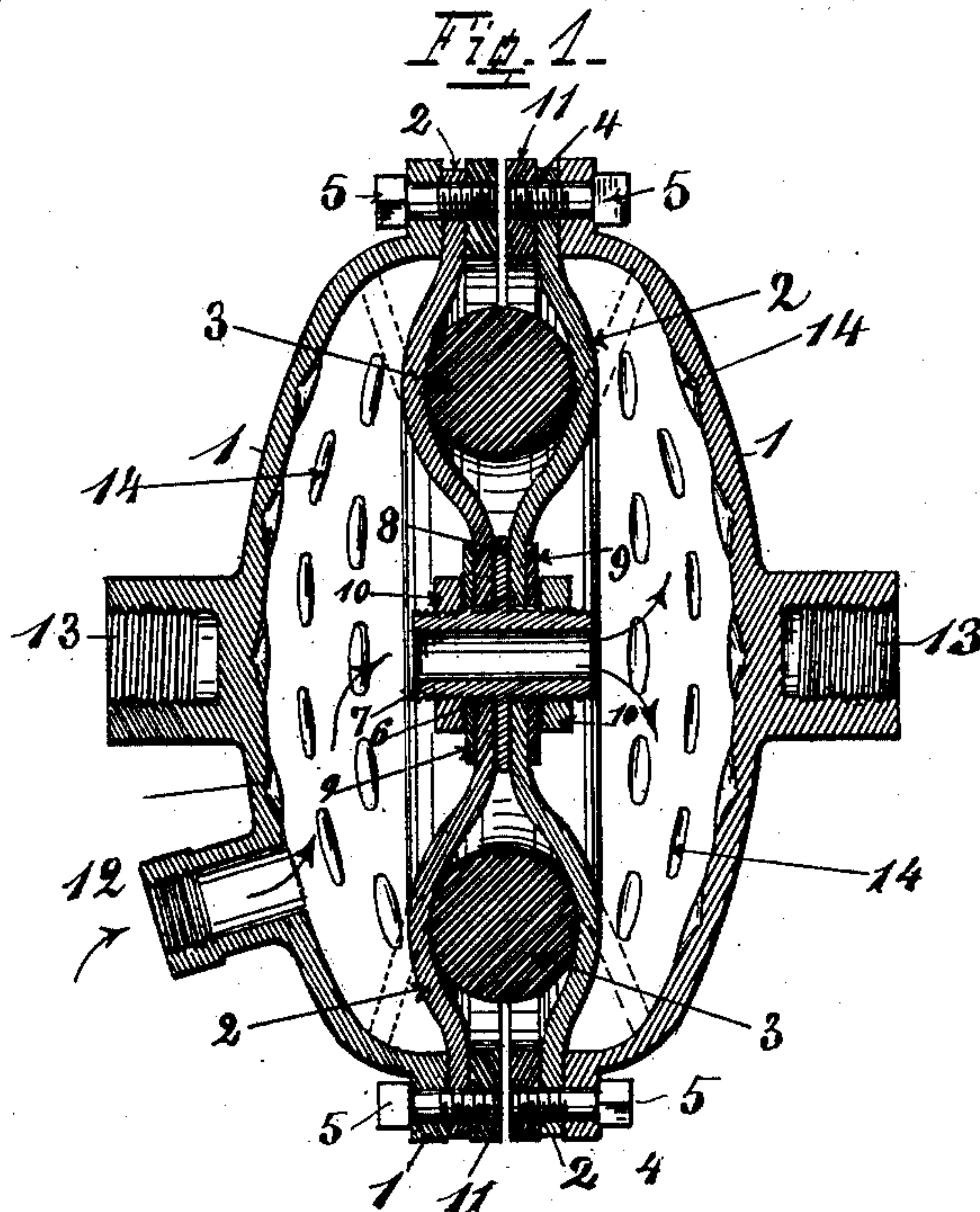


(No Model.)

C. W. BOLUSS.
DIAPHRAGM MOTOR.

No. 360,651.

Patented Apr. 5, 1887.



Attest
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Inventor
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by Carl Spengel his Atty.

UNITED STATES PATENT OFFICE.

CLARENCE W. BOLUSS, OF NORWOOD, OHIO.

DIAPHRAGM-MOTOR.

SPECIFICATION forming part of Letters Patent No. 360,651, dated April 5, 1887.

Application filed October 25, 1886. Serial No. 217,193. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE W. BOLUSS, a citizen of the United States, residing at Norwood, Hamilton county, State of Ohio, have
5 invented a new Diaphragm-Motor, of which the following is a specification.

My invention relates to such mechanism in which, principally, compressed air is used; and the object of my improvement is to gain additional power by passing said fluids through
10 one or more diaphragm-motors, (as, in short, I might call my apparatus.) I attain these objects by the construction illustrated in the accompanying drawings, in which—

15 Figure 1 is a central longitudinal section of the diaphragm-motor. Fig. 2 is a central cross-section of the same.

My diaphragm-motor consists, next, in two segmental shells, 1 1, two flexible diaphragms,
20 2 2, preferably of leather, a ring, 3, placed loosely between the diaphragms, and means for connecting said diaphragms. In constructing the diaphragm-motor the diaphragms are next cut to the proper size and provided with
25 holes 4 near their outer edges to allow bolts 5 to pass through, and with a central hole, 6, through which a sleeve, 7, having midway a flange, 8, passes. The diaphragms are secured to either side of flange 8 on sleeve 7 by
30 washers 9 and nuts 10.

Before screwing home the second diaphragm a ring, 3, is placed loosely between them. This ring may be solid or hollow, and its diameter is so small in relation to the diaphragms that their outer edges may lap over
35 it so as to almost touch each other. To the outer edge of each diaphragm 2 is secured a segmental shell, 1, by bolts 5, which pass through holes in an annular flange on shell 1, thence
40 through holes 4 in the diaphragms, and finally screw into a ring, 11, which takes the place of a nut to each bolt and clamps the diaphragm tightly all round to the shell. One of the shells is provided with an inlet, 12, for the expanding fluid, and each one may have on its outer
45 side a socket, 13, preferably screw-threaded. By one of these sockets the whole apparatus is permanently secured in position wherever used, while to the other socket are connected
50 those parts which are intended to be actuated by the diaphragm-motor. I do not confine myself, however, to this mode of attachment

alone. The diaphragm-motor may sit loosely in a cylinder or between guide-rods. Indentations 14 are provided on the inner side of the
55 shells 1 to increase the cubic capacity of the space occupied by the expanding fluid.

Ordinarily the diaphragm-motor is in a collapsed condition, as shown in the drawings, being kept so either by the resistance of
60 any machinery it is connected with or by springs or weights being provided for that purpose.

The fluid which expands the apparatus enters through the inlet 12, and, passing through
65 the passage in sleeve 7, fills the two shells and straightens the diaphragms, as shown in dotted lines in Fig. 1. If there were nothing between the diaphragms, they would merely
70 straighten out, leaving the shells in their position; but, having ring 3 placed between them, they are forced apart from either side of the ring in the same time. Thus the diaphragms become levers, ring 3 forming their pivot at
75 the point where the former comes in contact with it, and the initial pressure of the entering fluid is increased by the additional power of said levers.

This apparatus may be used wherever high pressure is needed, and in its effects is very
80 similar to a hydraulic press. It may be, in connection with appropriate machinery, used as a lifting-jack, propelling-motor, brake, and many other purposes. As a means to actuate
85 the brake mechanism of railway-cars it is especially well adapted. In this case it may be secured by one of those sockets 13 to a stationary fixture on the car, while the other
90 socket 13 takes the connection to the brake-beam.

Several diaphragm-motors may be secured together, having a passage for the fluid from
95 one to the other, thereby increasing the stroke or lift of the apparatus as many times as the number of diaphragm-motors is increased.

I do not confine myself to any material to be used—the diaphragm may be leather, rubber, or metal (steel)—nor to the nature of the
100 expanding-fluids, which may be water, oil, air, steam, or any other vapor.

Having thus explained my invention, what I claim as new, and want to secure by Letters Patent, is as follows:

1. A diaphragm-motor consisting of two dia-

phragms, 2 2, connected centrally and secured to a sleeve, 7 8, or otherwise united in a suitable manner, having a loose ring, 3, between to keep them apart, secured by their outer edges to shells 1 1, one of them having an inlet, 12, and having a central orifice through which the fluid fills the shells.

2. The combination of the following elements for the purposes described: two shells, 1 1, having initial sockets 13 13, or other equivalents, to connect them to and with the machinery in combination with which they are to be used, one shell having an inlet, 12, to admit the fluids, indentations 14 to increase the cubic capacity of the expanding fluids, two flexible diaphragms, 2 2, centrally connected with each other in a suitable manner, each diaphragm connected with its outer edge

to one of the shells 1, a central passage in the diaphragms, whereby fluids pass from one shell to the other, and a ring, 3, placed loosely between the diaphragms, which forms an abutment to the former when the apparatus is expanded.

3. The combination of such diaphragm-motors as above described with ring 3 in series, whereby the lift or stroke of the whole combined apparatus is multiplied as many times as the number of diaphragm-motors is increased.

In testimony of which invention I hereunto set my hand.

CLARENCE W. BOLUSS.

Witnesses:

CARL SPENGEL,
AARON E. MOORE.