

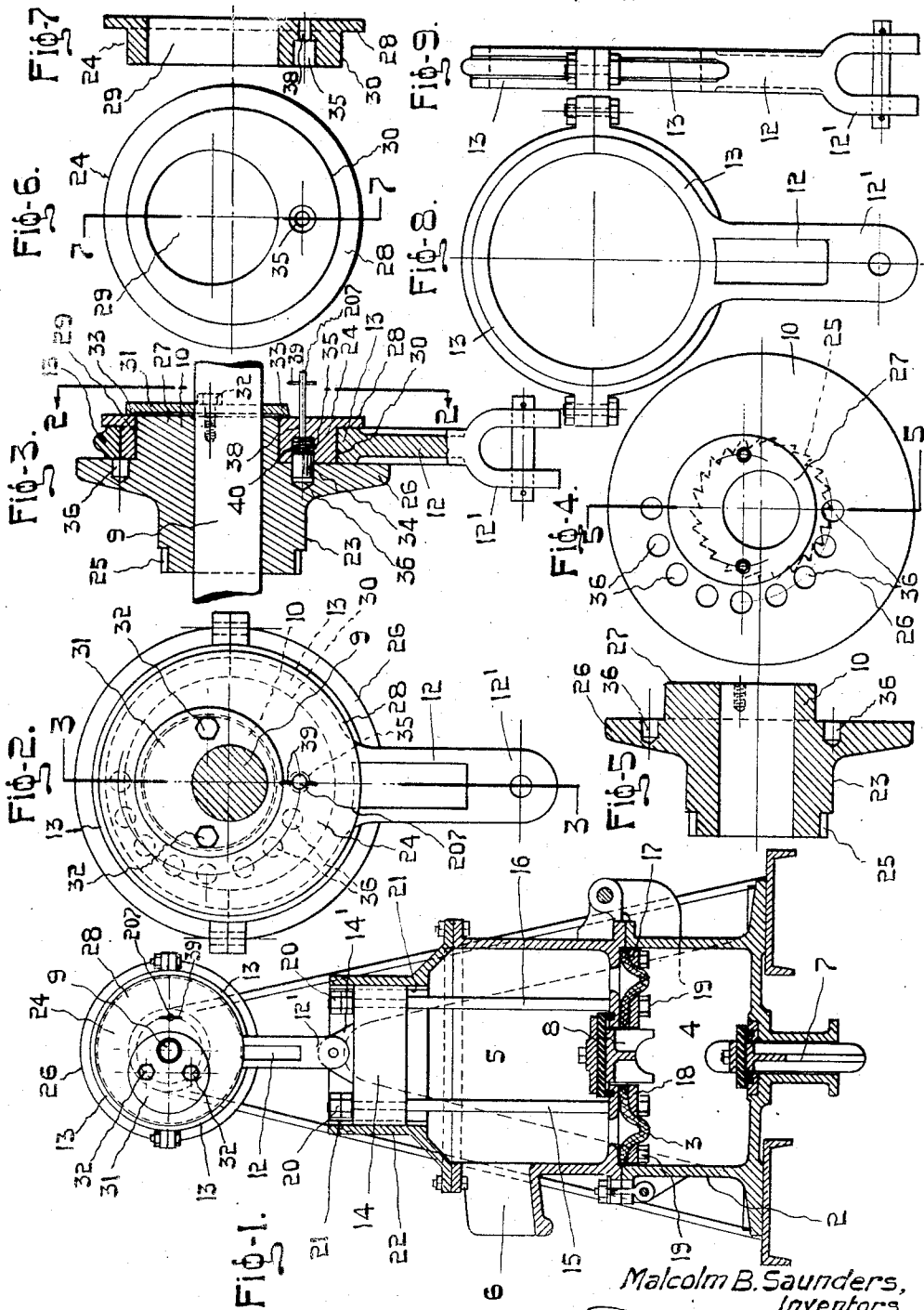
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TRANSMISSION OF POWER

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UNITED STATES PATENT OFFICE.

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TRANSMISSION OF POWER.

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To all whom it may concern:

Be it known that I, MALCOLM B. SAUNDERS, of the city of Owen Sound, Province of Ontario, Dominion of Canada, a subject of the King of Great Britain, have invented certain new and useful Improvements in Transmission of Power; and I do hereby declare that the following is a full, clear, and exact description thereof.

The invention disclosed herein forms a divisional part of a companion application bearing Serial No. 571,644. It relates particularly to the adjustment of the extent of reciprocatory movement of the diaphragm in the pump disclosed in the said application but I do not wish to be confined to this particular application as the invention may be employed broadly as an intermediary between a rotary element and a reciprocatory element.

For full comprehension, however, of my invention reference must be had to the accompanying drawings in which similar reference characters indicate the same parts and wherein:

Figure 1 is a vertical sectional view of a diaphragm pump equipped with my invention;

Figure 2 is a sectional view taken on line 2—2 Figure 3 and looking in the direction of the arrows;

Figure 3 is a sectional view taken on line 3—3 Figure 2;

Figure 4 is a detail elevation of one of the eccentrics;

Figure 5 is a sectional view thereof, the section being taken on line 5—5 Figure 4;

Figure 6 is a detail elevation of the other eccentric;

Figure 7 is a sectional view taken on line 7—7 Figure 6;

Figure 8 is a detail view of the reciprocatory element; and

Figure 9 is an elevation taken at right angles to Figure 8.

Referring to Figure 1 of the accompanying drawings the casing of a diaphragm pump is indicated at 2, diaphragm at 3, suction chamber at 4, delivery chamber at 5 with discharge outlet at 6, suction valve at 7 and the valve controlling communication between the suction and delivery chambers at 8.

The diaphragm is actuated by a shaft 9

and the means for effecting the operative connection between such diaphragm and shaft forms the essence of the present invention. This means consists of an eccentric 10 mounted upon the shaft 9 and adapted to rotate therewith, a connecting rod 12, one end of which terminates in a collar 13 adapted to encircle the eccentric, and a yoke comprising a cross head 14 and elongated bolts 15 and 16. The opposite ends of the bolts are of reduced diameter and threaded, the lower ends being connected to the diaphragm by rings 17 and 18 and nuts 19 and the upper ends are extended through vertical openings in the cross-head at opposite ends thereof and are secured to the latter by nuts 20.

The cross-head is of substantially oblong form and its ends are slidably mounted in vertical guideways 21 in a cylindrical extension 22 of the casing so that a straight up and down movement is translated to the diaphragm.

In order to provide a connection between the cross head and connecting rod which may be readily disconnected the top of the cross-head has an upwardly extending lug 14¹, the lower end of the connecting rod is forked and straddles this lug as at 12¹, and a removable pin is passed through aligned openings in the lugs and arms of the fork.

In order to permit of adjustment of the throw of the eccentric the latter is divided into two parts 23 and 24. The first part 23 consists of a sleeve encircling the shaft 9 and adapted to be connected thereto through a clutch 25 or other suitable means, such sleeve having a circumferential flange 26 adjacent its reduced end 27 and the periphery of the latter being eccentric to the axis of the shaft. The second part 24 is in the form of a collar having a flange 28 and an opening 29 eccentrically disposed relatively to its circumferential surface 30 the opening being slightly greater than the eccentric end 27 to permit of the mounting of the collar thereon. The collar 13 of the connecting rod is adapted to be interposed between the flanges 26 and 28 in position encircling the portion 30 of the eccentric collar 24, the parts being maintained in their respective positions by a plate 31 fastened to the hub 27 of the eccentric 23 by cap screws 32. This plate is larger in diameter than the

hub to which it is secured and its face adjacent thereto is provided with a circumferential rib 33 which is adapted to press the eccentric part 24 into contact with eccentric part 23. This serves to prevent strain on the means for interlocking the eccentric parts so that they rotate in unison. This locking means is constructed and arranged to permit of adjustment of the throw of the eccentric by a turning movement of the eccentric part 24 upon the part 23. The locking means consists of a pin 34 mounted in a socket 35 in the eccentric 24 and adapted to register with any one of a series of sockets 36 in the flange 26, the pin having a reduced end 207 which is extended outwardly through an opening 38 and having a fingerhold 39 which enables the pin to be pulled completely out of a socket in the part 23 when adjusting. A spring 40 encircling the reduced portion of the pin and located with the socket 35 yieldingly maintains the pin in position in the socket in the eccentric 23 in which it has been positioned.

To adjust the throw of the eccentric the cap screws 32 are loosened sufficiently to allow the eccentric part 24 to be turned. The pin 34 is then withdrawn from its socket in the eccentric part 23 and the part 24 turned until the desired eccentricity is obtained. Figures 2 and 3 illustrate the parts in a neutral position in which the eccentricity of one part relatively to the shaft 9 is neutralized by that of the other part. From this position by turning the part 24 in a clockwise direction the throw of the eccentric unit is increased commensurately with the extent of such movement.

What I claim is as follows:

1. The combination with a rotary element and a reciprocatory element, of adjustable means effecting an operative connection therebetween, said means including a plurality of eccentrics adjustable relatively to each other, one of said eccentrics having a series of sockets and the other having a movable pin adapted to enter each of said sockets, the axial line of each socket and the pin being disposed parallel to the axis of the rotary element, and means for yieldingly maintaining the pin in position projecting into one of the sockets when the eccentrics are in adjusted position.

2. The combination with a rotary element and a reciprocatory element, of adjustable means effecting an operative connection therebetween, said means including a plu-

rality of eccentrics adjustable relatively to each other, one of said eccentrics having a series of sockets and the other having a movable pin adapted to enter each of said sockets, the axial line of each socket and the pin being disposed parallel to the axis of the rotary element, means for yieldingly maintaining the pin in position projecting into one of the sockets when the eccentrics are in adjusted position and means for manually withdrawing the pin from the socket into which it projects.

3. The combination with a shaft and a diaphragm, of means for converting rotation of the shaft into reciprocation of the diaphragm, said means consisting of an eccentric encircling the shaft and adapted to rotate in unison therewith, a second eccentric encircling the first eccentric, means for adjustably connecting the eccentrics to cause them to rotate in unison, said means consisting of a series of sockets in one and a movable pin in the other adapted to enter any of the sockets, a spring encircling said pin and yieldingly maintaining the same in position projecting into one of the sockets, a fingerhold on said pin for manually withdrawing the same, means for preventing axial separation of the eccentrics and a connecting rod having a collar encircling the second eccentric, and means operatively connecting the connecting rod to the diaphragm.

4. The combination with a rotary element and a reciprocatory element, of means for converting rotation of the former into reciprocation of the latter, said means consisting of a sleeve encircling the shaft and rotatable therewith, said sleeve having a reduced end presenting a periphery eccentric to the axis of the shaft and a radially disposed flange adjacent said reduced end; a collar having an opening eccentric of its periphery and encircling the reduced end, said last-mentioned periphery being flanged; a plate fastened to the reduced end of the sleeve and adapted to prevent relative displacement between the same and the collar, and a connecting rod encircling the collar and connected to the reciprocatory element, said flange on the sleeve having a plurality of sockets therein, and a pin adjustably mounted in the collar and adapted to enter the sockets.

In testimony whereof I have signed my name to this specification.

MALCOLM B. SAUNDERS.