

April 17, 1934.

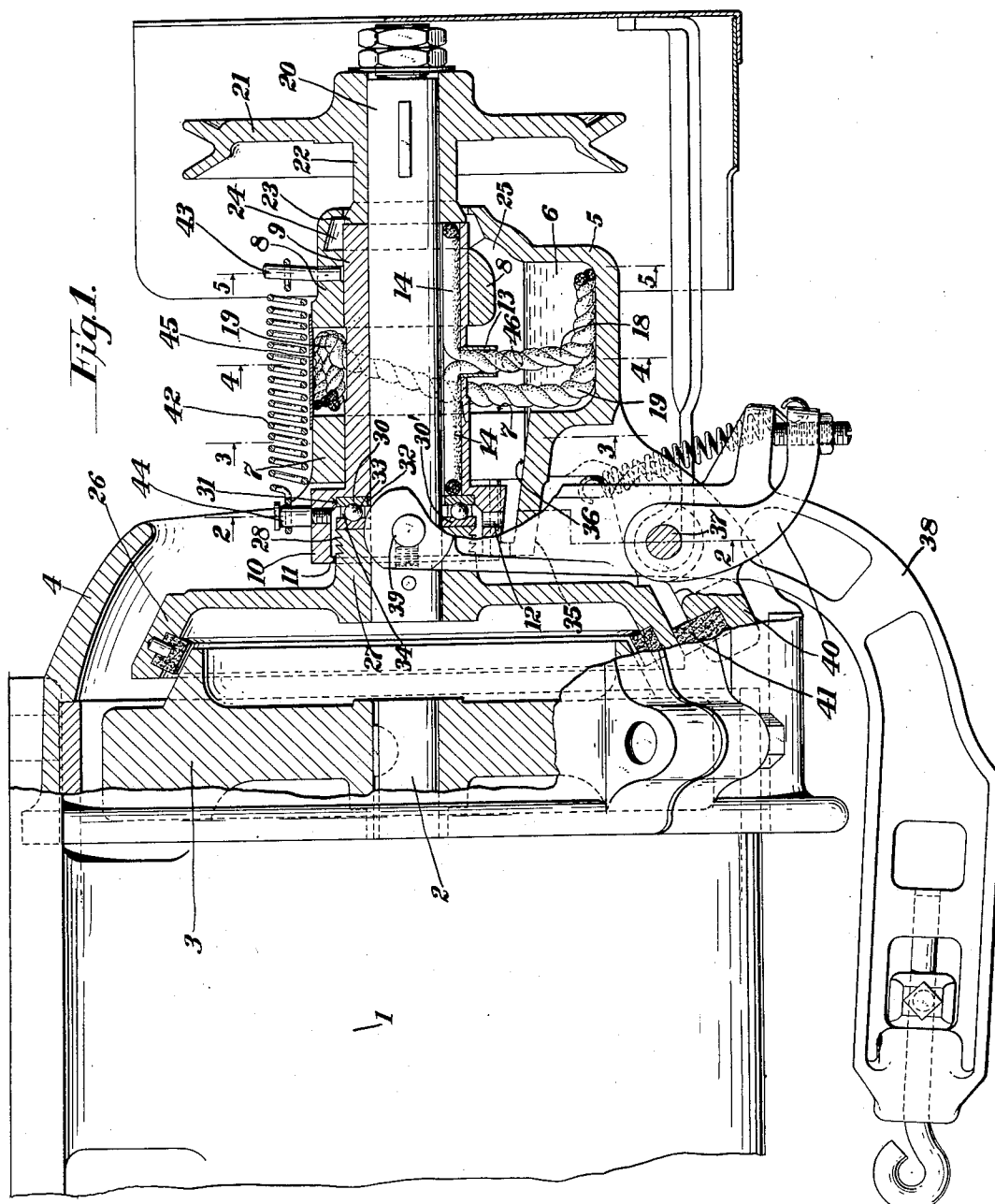
W. J. PEETS ET AL

1,955,604

POWER TRANSMITTER

Filed June 25, 1932

2 Sheets-Sheet 1



Inventors
Wilbur J. Peets
and Irving F. Webb

Witness:

John H. Cave

By Henry J. Miller

Attorney

April 17, 1934.

W. J. PEETS ET AL

1,955,604

POWER TRANSMITTER

Filed June 25, 1932

2 Sheets-Sheet 2

Fig. 2.

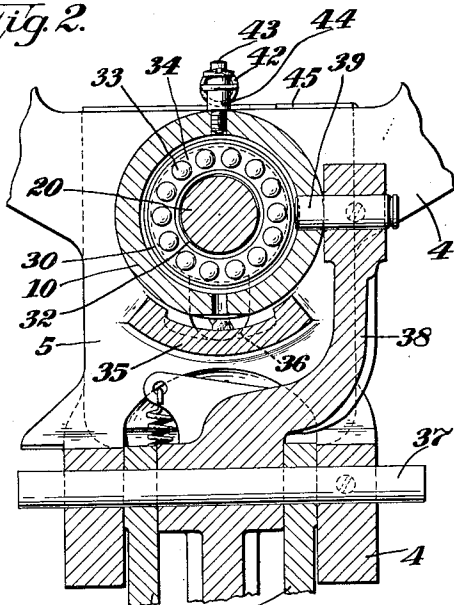


Fig. 3.

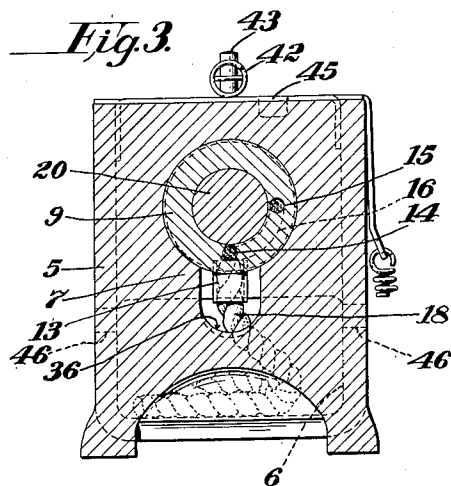


Fig. 4.

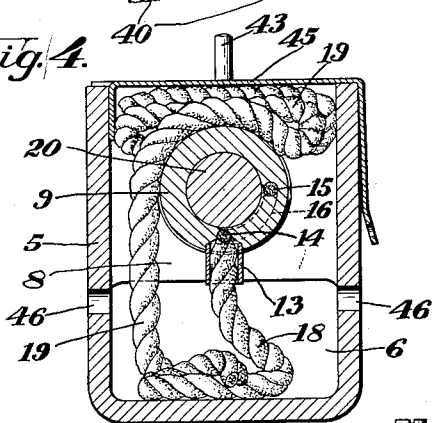
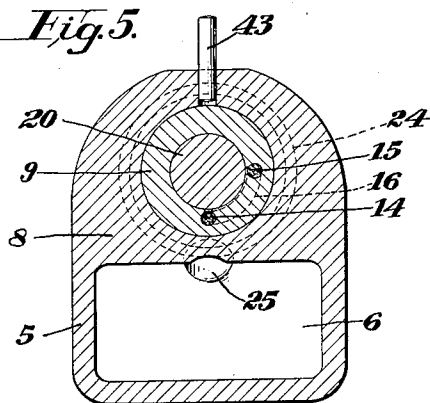
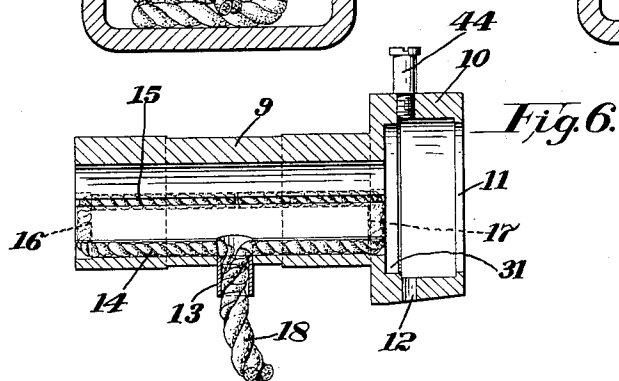


Fig. 5.



Inventors
Wilbur J. Peets
and Irving F. Webb

Witness:

John H. Cave

By

Henry Miller

Attorney

UNITED STATES PATENT OFFICE

1,955,604

POWER-TRANSMITTER

Wilbur J. Peets and Irving F. Webb, Elizabeth, N. J., assignors to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Application June 25, 1932, Serial No. 619,228

5 Claims. (Cl. 184—6)

This invention relates to power-transmitters, more particularly of the type disclosed in the patent to Herr, No. 1,514,083, of Nov. 4, 1924, and has for an object to simplify and improve the construction of the transmitter for better lubrication of the working parts.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the accompanying drawings, Fig. 1 is an elevation, partly in section of an electric motor and power-transmitter unit embodying the invention. Figs. 2, 3, 4 and 5 are sections substantially on the lines 2—2, 3—3, 4—4 and 5—5, respectively, Fig. 1. Fig. 6 is a longitudinal vertical section through the slide-shaft element of the transmitter.

The invention is shown as embodied in a motor-transmitter unit comprising an electric motor having a frame 1 and power-shaft 2 to which is fixed the live cone clutch-member 3. Fixed to the motor-frame 1 is the transmitter-frame 4 formed with a box-like portion or casing 5, the hollow lower portion of which constitutes an oil-well 6. The casing 5 is formed internally with spaced bearings 7, 8 for the tubular slide-shaft or quill 9 formed at one end beyond the bearings 7, 8 and externally of the casing 5 with an enlarged cup-shaped head 10 having an inwardly extending circular oil-retaining flange 11 and an oil-drainage aperture 12 in its lower wall.

The slide-shaft 9 carries an oil-duct 13 which extends through a portion of the wall of the slide-shaft 9 centrally of the latter between the bearings 7 and 8. The slide-shaft 9 is formed with spaced parallel longitudinal grooves 14, 15 connected by end grooves 16, 17. The longitudinal groove 14 intersects the oil-duct 13. The several grooves mentioned are filled with wicking 18 which extends downwardly through the oil-duct 13 into the oil-well 6. A wick 19 extends upwardly from the oil-well 6 externally of the slide-shaft 9 and is looped back and forth to form a wad resting on top of the slide-shaft 9 in the space between the bearings 7 and 8.

Journalled in the slide-shaft 9 is a rotary shaft 20 on one end of which is splined a belt-pulley 21 having a hub 22 formed with an oil-throwing flange 23 within the annular oil-catching groove

24 in the casing 5. An oil-drainage duct 25 connects the bottom portion of the oil-catching groove 24 to the oil-well 6.

Pinned to the other end of the rotary shaft 20 is the driven cone clutch-element 26 the hub 27 of which enters the cup-shaped head 10 of the slide-shaft 9 and is formed with oil-throwing flanges 28. A ball thrust-bearing is disposed between the hub 27 and the slide-shaft 9 within the head 10. This ball thrust-bearing includes hardened race-rings 30 and 30', of which the ring 30 is fitted in the circular seat 31 in the head 10 and has clearance 32 between it and the shaft 20, so that oil will pass through such clearance from the wick-filled grooves 14 and 17 into a zone within the ball bearing, from which zone the oil is thrown outwardly by centrifugal force past the balls 33 in the cage 34 between the race-rings 30 and 30' and thoroughly lubricates the ball bearing surfaces. Spent oil from the ball bearing collects within the head 10 and drains through the aperture 12 onto the troughed ledge 35 which projects from the casing 5 under the head 10 and is connected to the oil-well by an oil-return passageway 36.

Fulcrumed on the cross-pin 37 is the treadle-operated lever 38, the upwardly extending arm of which carries a lateral stud-pin 39 engaging an aperture in the side wall of the head 10 of the slide-shaft for imparting endwise movement to the latter to establish driving relation between the live and driven clutch-elements. A brake-lever 40 carrying a brake-shoe 41 is actuated by the recovery motion of the lever 38 to apply the brake-shoe to the driven clutch-element 26. The recovery motion of the parts is caused by the action of the biasing spring 42 anchored at one end to the frame-pin 43 and at its opposite end to the screw-pin 44 in the head 10 of the slide-shaft. A sheet-metal cover 45 closes the top opening of the casing 5.

In the operation of the device, lubricant is drawn upwardly from the oil-well 6 by the wick 19 and applied to the bearing surfaces externally of the slide-shaft. Oil is also drawn upwardly by the wick 18 and evenly distributed in opposite directions lengthwise of and within the slide-shaft 9 to lubricate the rotary shaft 20. The ball thrust-bearing is lubricated with fluid oil supplied by the wick 18 and never requires to be cleaned and repacked as is the case with ball bearings designed to be lubricated with grease. Spent oil from all of the bearing surfaces drains back into the oil-well and cannot leak away or escape to be thrown off by the rotating parts and spread over the

floor. Apertures 46 in the casing 5 above the bottom of the oil-well 6, establish the proper oil-level in the well, which oil-level should not rise above the ledge 35. The oil-duct 13 and wicking 18 are entirely enclosed within and protected by the frame-casing 5.

By virtue of the short vertical path or lift of the oil through the wick 18 from the oil-level in the well 6 to the rotary shaft 20 and by virtue of the disposition of the intake aperture 13 centrally of the slide-shaft 9, a generous flow of oil is maintained within the slide-shaft 9.

The diameter of the oil tube 13 is less than the width of the passageway 36 in the bearing 7, as shown in Fig. 3, and may be readily passed through such bearing, together with the wick 18, in assembly or disassembly of the parts; the tube 13 preventing accidental shearing of the wick by turning of the slide-shaft 9 in the bearing 7 during such assembly or disassembly.

The invention is not to be understood as limited to the specific embodiment shown and described as various other structural embodiments of the essence of the invention will readily occur to those skilled in the art from the teachings of the present disclosure.

Having thus set forth the nature of the invention, what we claim herein is:—

1. In a power-transmitter, a frame formed with spaced bearings and with a casing including said bearings and enclosing the space therebetween, said casing being formed below said bearings with an oil-well, a tubular slide-shaft journaled in said bearings, a rotary shaft journaled in said slide-shaft, said slide-shaft having in its wall at a point between said spaced bearings an oil-intake aperture leading to the bearing surfaces between said rotary shaft and slide-shaft, means for conducting oil from said oil-well through said aperture to said bearing surfaces within said slide-shaft, means for conducting oil from said oil-well upwardly between said spaced bearings externally of said slide-shaft to the bearing surfaces between the slide-shaft and said spaced bearings, a driven clutch-element fixed to said rotary shaft, a thrust-bearing between said slide-shaft and driven clutch-element, a live clutch-element and means for moving said slide-shaft endwise, said casing being formed with a ledge underhanging said thrust bearing and with an oil-return passageway from said ledge to said oil-well.

2. In a power-transmitter, a frame formed with an oil-well, a slide-shaft journaled in said frame above said oil-well and formed at one end with an enlarged hollow head having an inwardly extending end-flange and an aperture in its lower wall, a rotary shaft journaled in said slide-shaft, a live clutch-element adjacent the headed end of said slide-shaft, a driven clutch-element fixed to said rotary shaft and having a hub entering the hollow head of said slide-shaft, a thrust-bearing in said hollow head between said hub and slide-shaft, means for conducting oil from said oil-well through said hollow shaft to the bearing surfaces between the latter and said rotary shaft, said

frame being formed with an oil-catching ledge below said head and with an oil-return passageway leading from said ledge to said oil-well, and means applied to said slide-shaft for moving the latter endwise to establish driving relation between said driven and live clutch-elements.

3. In a power-transmitter, a frame formed with an oil-well, a slide-shaft journaled in said frame above said oil-well and formed at one end with an enlarged hollow head having an inwardly extending end-flange and an aperture in its lower wall, a rotary shaft journaled in said slide-shaft, a live clutch-element adjacent the headed end of said slide-shaft, a driven clutch-element fixed to said rotary shaft and having a hub entering the hollow head of said slide-shaft, a ball-thrust bearing in said hollow head between said hub and slide-shaft, means for conducting oil from said oil-well through said hollow shaft to the bearing surfaces between the latter and said rotary shaft, said frame being formed with an oil-catching ledge below said head and with an oil return passageway leading from said ledge to said oil-well, means applied to said slide-shaft for moving the latter endwise to establish driving relation between said driven and live clutch-elements, and means for conducting oil from said oil-well externally of said slide-shaft to the bearing surfaces between said frame and slide-shaft.

4. In a power-transmitter, a frame formed with a bearing and with an oil-well below said bearing, a tubular slide-shaft journaled in said bearing and having an enlarged cup-shaped head at one end thereof with an oil-drainage opening in its under wall, a rotary shaft journaled in said slide-shaft, a driven clutch-element fixed to said rotary shaft and having a hub entering the cup-shaped head on said slide-shaft, means for conducting oil from said oil-well to the bearing surfaces between said slide-shaft and rotary shaft, a hardened ball-race ring surrounding and spaced from said rotary shaft within said head to permit passage of oil from the inner bearing surface of said slide-shaft, ball members between said race and the hub of said driven clutch element, a ledge on said frame underhanging said oil-drainage opening, said frame having an oil-return passageway from said ledge to said oil-well, a live clutch element, and means for moving said slide-shaft endwise.

5. In a power-transmitter, a frame formed with an oil-well, a tubular slide-shaft journaled in said frame, a rotary shaft journaled in said slide-shaft, a ball thrust-bearing within one end of said slide-shaft, means on the rotary shaft in thrust relation with said ball-bearing, means for conducting oil from said oil-well to the bearing surfaces between said rotary shaft and slide-shaft and from said bearing surfaces to a zone within said ball thrust-bearing from which the oil is thrown outwardly through the ball thrust-bearing by centrifugal force, and means for collecting the oil thrown from the ball-bearing and returning it to said oil-well.

WILBUR J. PEETS.
IRVING F. WEBB.