74. MACHINE ELEMENTS AND MECHANISMS.

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No. 819,334. PATENTED MAY 1, 1906.

A. T. BROWN.

TRANSMISSION GEAR.

APPLICATION FILED NOV. 16, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

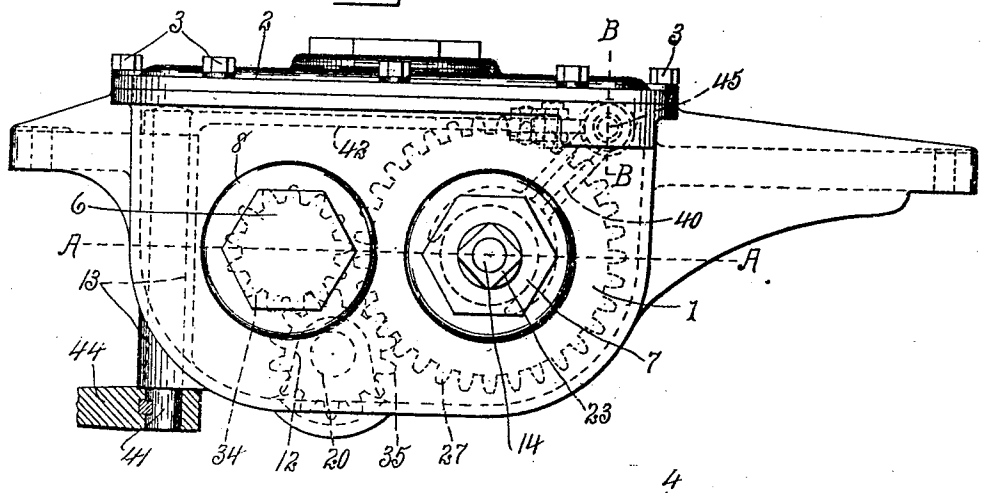


Fig. 4.

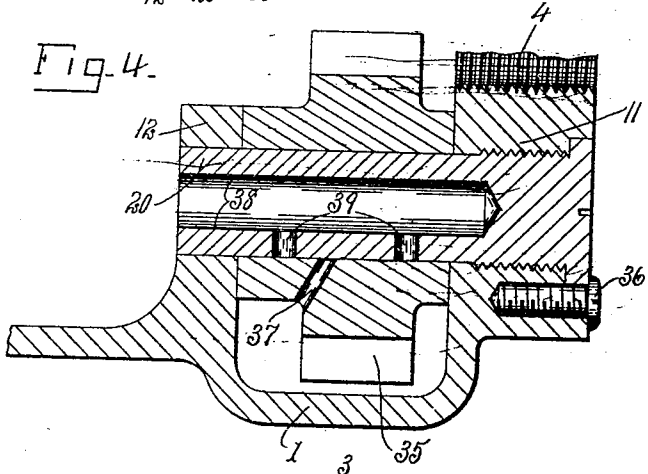
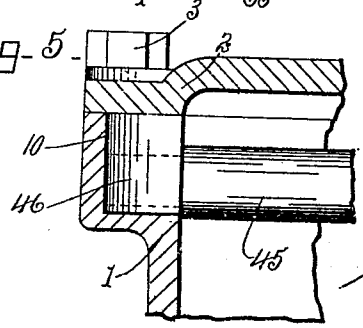


Fig. 5.



WITNESSES:

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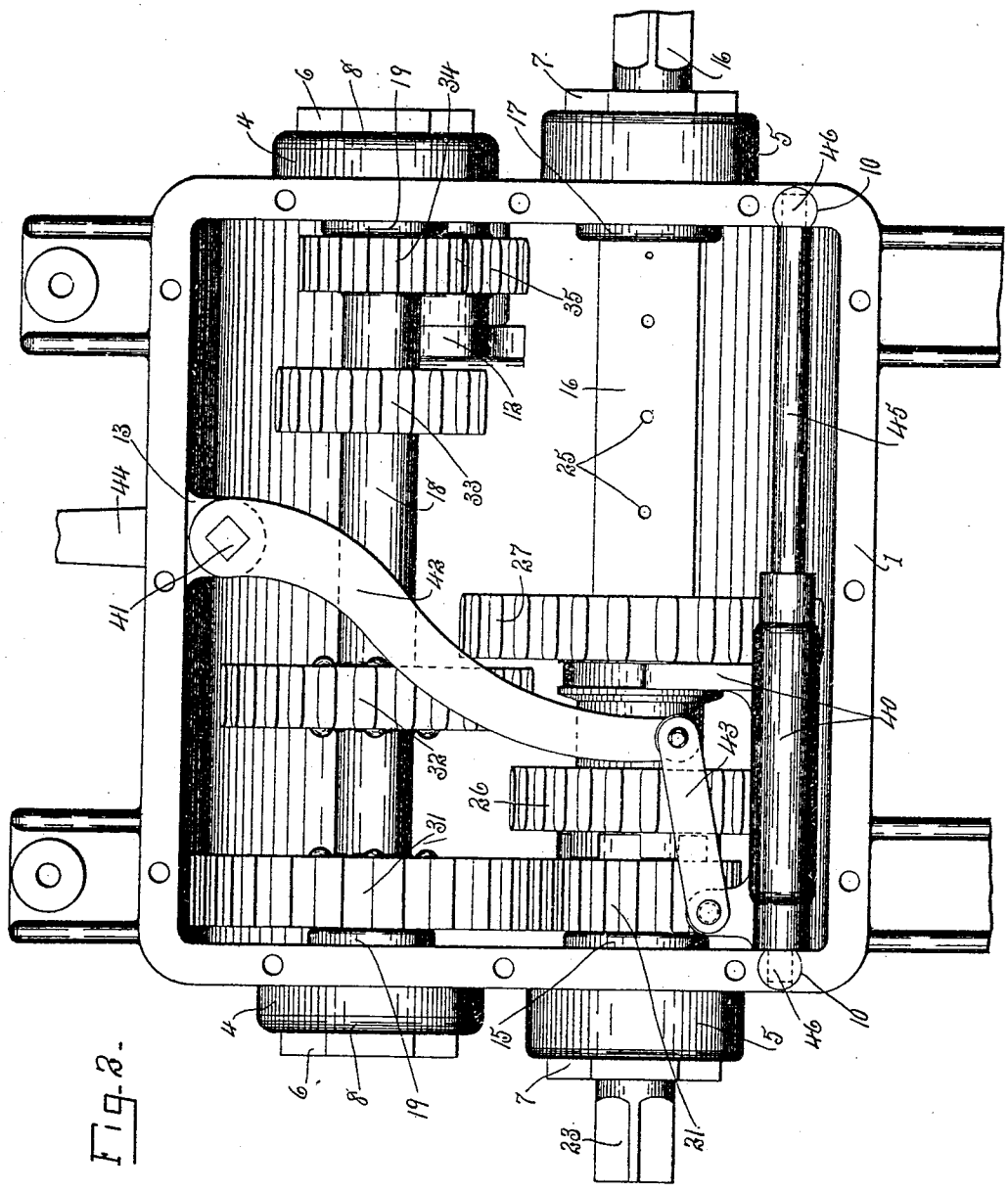

Fig. 2.

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3 SHEETS—SHEET 3.

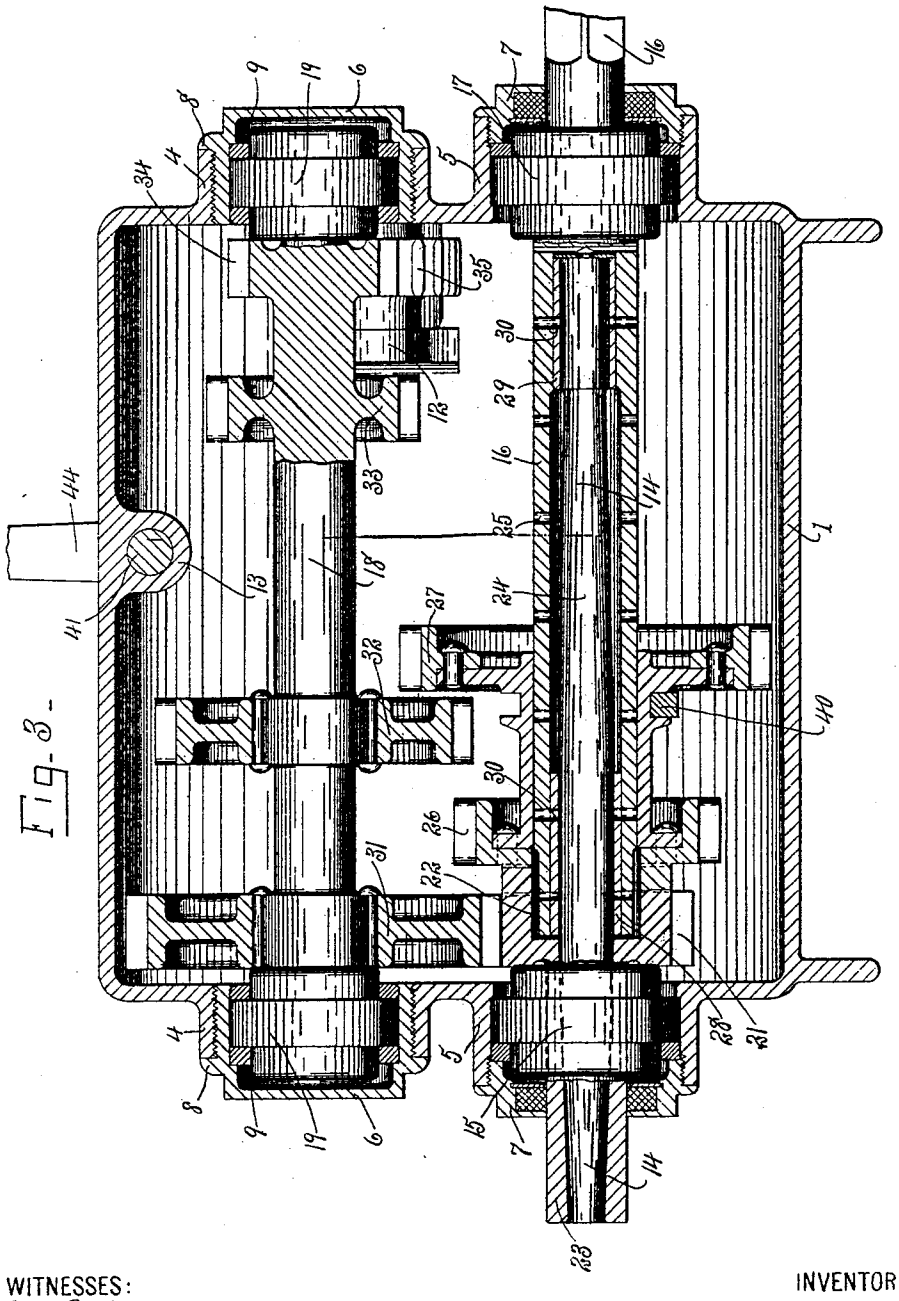

Fig. 3.

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UNITED STATES PATENT OFFICE.

ALEXANDER T. BROWN, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE BROWN-LIPE GEAR COMPANY, OF SYRACUSE, NEW YORK, A COPARTNERSHIP.

TRANSMISSION-GEAR.

No. 819,334. Specification of Letters Patent. Patented May 1, 1906.

Application filed November 16, 1905. Serial No. 287,580.

To all whom it may concern:

Be it known that I, ALEXANDER T. BROWN, of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Transmission-Gear, of which the following is a specification.

My invention has for its object the production of a transmission-gear which is particularly simple in construction and highly efficient and durable in use; and to this end it consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention reference is had to the accompanying drawings, in which like characters designate corresponding parts in all the views.

Figure 1 is an end elevation, partly broken away, of my transmission-gear, parts being indicated by dotted lines. Fig. 2 is a plan thereof, partly broken away, the top being removed. Fig. 3 is a sectional view, partly broken away and in elevation, on line A A, Fig. 1. Fig. 4 is an enlarged sectional view, partly in elevation, illustrating one of the gears and contiguous parts. Fig. 5 is an enlarged sectional view, partly in elevation, on line B B, Fig. 1.

The case or receptacle 1 has a removable top 2, secured by any desirable fastening means, as screws 3, to the side and end walls of the case, the upper edges of said walls being generally opposed to the marginal portions of the top 2. The opposing end walls of the case 1 are each provided with integral internally-threaded hubs 4 5 below the top 2, the hubs 4 being closed by caps 6 and the hubs 5 being provided with axially-perforated caps 7. Said caps 6 extend in the hubs 4 and are provided with external threads meshing with the internal threads of the hubs and are also provided with annular shoulders 8, engaging the ends of the hubs, and with sockets 9, extending axially from the inner ends of the caps and having closed outer ends. The end walls of the case are also provided with channels 10, opening through the inner faces of said walls and through their upper edges opposed to the cover 2. One of the end walls of the case is formed with an internally-threaded hub 11, Fig. 4, and the bottom of the case is provided with an internal lug 12, formed with a bearing alined with the opening of the hub 11. The case is also provided with an upright journal-bearing 13, extending from the bottom and terminating near the top 2, the opening of the bearing extending through the outer face of the bottom.

The power-transmitting means of my invention comprises a driving-shaft 14, passed through the perforation of one of the caps 7 and journaled in a bearing 15 within one of the hubs 5, a driven shaft 16, passed through the perforation of the other cap 7 and journaled in a bearing 17 in the other hub 5, a counter-shaft 18, journaled in bearings 19, mounted in the sockets 9 of the caps 6, and a spindle 20, supported in the hub 11 and the lug 12. As best seen in Fig. 3, the driving-shaft 14 terminates near the bearing 17 for the driven shaft 16 and carries a gear 21, fixed thereto and provided with a socket 22, extending axially from its inner side, and with a hollow hub 23, which projects from its opposite side, encircles the portion of the shaft 14 within the bearing 15, and is journaled in the bearing 15. As will be obvious to those skilled in the art, the hub of the gear 21 is essentially a part of the shaft 14. A part 24 of the driving-shaft 14 between the inner end thereof and the bearing 15 is formed of reduced diameter. The driven shaft 16, journaled in the bearing 17, is formed with a hollow portion encircling the inner end of the driving-shaft 14 and extending into the socket 22 of the gear 21 and terminating near the bearing 15 for said driving-shaft. The hollow portion of the driven shaft 16, which is preferably of angular cross-section, is formed with transverse ducts 25, communicating with the interior thereof, and supports a pair of sliding gears 26 27, suitably fixed together, one of these gears having a clutch-face for coacting with a corresponding clutch-face on the gear 21. Bushings 28 29 are interposed between contiguous surfaces of the shafts 14 16 at opposite sides of the reduced part 24 of the shaft 14, are suitably fixed to the shaft 16, and are formed with transverse ducts 30, alined with some of the ducts 25. Driving and driven shafts constructed and arranged as described are firmly supported and resist to a maximum the strains and wear to which the same are subjected.

The counter-shaft 18 is provided with suitable gears 31 32 33 34 of dissimilar diameter, fixed thereto, the gear 31 being engaged with the gear 21, and the gears 32 33

being detachably engaged, respectively, by the gears 26 27, and the gear 34 being engaged with a gear 55, mounted on the spindle 20. The shaft 18 is preferably of greater length than the distance between the opposing walls of the case 1, and the gear 34 on said shaft is of less diameter than the internal opening of the contiguous hub 4 in order that said shaft and gear may be moved axially in the hub for facilitating assembling of said parts in position. The bearings 15, 17, and 19 are of any desirable construction, those illustrated being of the well-known type, comprising fixed external shells, revoluble internal rings, and antifriction rollers or balls between such shells and rings, and it is therefore thought unnecessary to further describe the same. As shown in Fig. 4, the spindle 20 extends through the hub 11 into the bearing of the lug 12 and is formed with a head provided with peripheral threads meshing with the internal threads of said hub. A screw 36 engages the hub 11 and the head of the spindle 20 for locking the spindle in position. Lubrication of the spindle is facilitated by ducts 37 in the gear 35, leading from the exterior of said gear to the spindle 20, a lengthwise passage 38 in the spindle 20, having one end closed and its other end opening through the end face of said spindle nearest the internal lug 12, and transverse ducts 39, extending through the periphery of the spindle from the passage 38.

The shifting mechanism for the sliding gears 26 27 comprises a rectilinearly-movable yoke 40, a rock-shaft 41, journaled in the bearing 13 and having its ends extended above and below said bearing, an arm 42, fixed to the upper end of the rock-shaft 41, a link 43, connecting the yoke 40 and the arm 42, and suitable means, as an arm 44, fixed to the lower projecting end of the rock-shaft 41 and connected to any suitable means, as a hand-lever or other operating part. (Not illustrated.) The yoke 40 is movable along a guide-rod 45, having its opposite ends supported in bearings 46, which are removably mounted in the channels 10 and are held in position by the cover 2. By supporting the rock-shaft 41 in a bearing constructed as described the liability of leakage of oil from the bearing for such rock-shaft is reduced to a minimum.

What I claim as new is—

1. In a transmission-gear, a case having opposing walls formed with integral hollow hubs, caps for the hubs, a revoluble shaft within the case formed of greater length than the distance between the opposing walls of the case, the shaft being supported by the hubs, and gears fixed to the shaft, the gear nearest one of the hubs being of less diameter than the internal opening of said one of the hubs, substantially as and for the purpose specified.

2. In a transmission-gear, a case provided with a removable top and having opposing walls formed with integral hubs below the top, perforated caps for the hubs, driving and driven shafts extending respectively through the perforations of the caps, and power-transmitting means within the case connecting the shafts, substantially as and for the purpose set forth.

3. In a transmission-gear, a case formed with a plurality of hubs, caps for closing two of the hubs, perforated caps for other hubs, a revoluble shaft within the case supported by the first-mentioned caps, driving and driven shafts extending respectively through the perforations of the second-mentioned caps, and gears within the case connecting the shafts, substantially as and for the purpose described.

4. In a transmission-gear, a case having opposite bearings, a shaft journaled in one bearing and terminating near the other bearing, a shaft journaled in said other bearing and having a hollow portion encircling the first-mentioned shaft and terminating near the bearing therefor, and power-transmitting means within the case connecting the shafts, substantially as and for the purpose specified.

5. In a transmission-gear, a case having opposite bearings, a shaft journaled in one bearing and terminating near the other bearing, a part of the shaft between the inner end thereof and the bearing for such shaft being of reduced diameter, a shaft journaled in said other bearing and having a hollow portion encircling the first-mentioned shaft and terminating near the bearing therefor, bushings between contiguous surfaces of the shafts at opposite sides of the reduced portion of the first-mentioned shaft, and power-transmitting means within the case connecting the shafts, substantially as and for the purpose described.

6. In a transmission-gear, a case having opposite bearings, a gear having a hollow hub on its outer side journaled in one bearing, said gear being formed with a socket extending axially from its inner side, a shaft fixed in the hollow hub and terminating near the other bearing, a shaft journaled in said other bearing and having a hollow portion encircling the first-mentioned shaft and extending into the socket of the gear and terminating near the bearing for such gear, and power-transmitting means within the case connecting the gear and the second-mentioned shaft, substantially as and for the purpose set forth.

7. In a transmission-gear, a case having opposite bearings, a shaft journaled in one bearing, a shaft journaled in the other bearing and having a hollow portion encircling the first-mentioned shaft, said hollow portion being formed with a plurality of transverse ducts communicating with the interior thereof, and power-transmitting means within the

case connecting the shafts, substantially as and for the purpose described.

8. In a transmission-gear, a case having opposite bearings, a shaft journaled in one bearing and terminating near the other bearing, a shaft journaled in said other bearing and having a hollow portion encircling the first-mentioned shaft and terminating near the bearing therefor, said hollow portion being formed with a plurality of transverse ducts communicating with the interior thereof, bushings between contiguous surfaces of the shafts, said bushings being formed with transverse ducts alined with the first-mentioned ducts, and power-transmitting means within the case connecting the shafts, substantially as and for the purpose specified.

9. In a transmission-gear, a case having an upright journal-bearing extending from the bottom of the case and terminating near the top of the case, the opening of the bearing extending through the outer face of the bottom, power-transmitting means in the case comprising a sliding gear, and mechanism for shifting the gear including a rock-shaft journaled in the bearing and extended downwardly outside of the case and upwardly above the upper end of the bearing, and means in the case for connecting the upper end of the rock-shaft and the sliding gear, substantially as and for the purpose set forth.

10. In a transmission-gear, a case having an upright journal-bearing extending from the bottom of the case and terminating near the top of the case, the opening of the bearing extending through the outer face of the bottom power-transmitting means in the case comprising a sliding gear, and mechanism for shifting the gear including a rectilinearly-movable yoke, a rock-shaft journaled in the bearing and extending downwardly outside of the case and upwardly above the upper end of the bearing, an arm fixed to the upper end of the rock-shaft, and a link connecting the yoke and the arm, substantially as and for the purpose described.

11. In a transmission-gear, a case formed with an opening, a removable part for closing the opening, and opposing walls having edges thereof opposed to the removable part, the opposing walls having channels opening through their inner faces and said edges, power-transmitting means in the case comprising a sliding gear, mechanism for shifting the gear including a rectilinearly-movable yoke, a guide-rod for the yoke, and bearings for the guide-rod mounted in the channels and held in place by said removable part of the case, substantially as and for the purpose specified.

12. In a transmission-gear, a case having one of its walls formed with an internally-threaded hub near the bottom thereof, said case having an internal lug projecting from its bottom and formed with a bearing alined with the opening of the hub, a spindle extending through the hub and into the bearing and having a head provided with peripheral threads meshing with the internal threads of the hub, a screw engaged with the threaded hub and the head of the spindle for locking said spindle in position, a gear on the spindle, and power-transmitting means within the case coacting with the gear, substantially as and for the purpose set forth.

13. In a transmission-gear, a case having one of its walls formed with a bearing near the bottom thereof, said case having an internal lug projecting from its bottom and formed with a bearing alined with the first-mentioned bearing, a spindle supported by said bearings and formed with a lengthwise passage having one end closed and its other end opening through the end face of the spindle nearest the internal lug, said spindle being formed with transverse ducts extending through its periphery from the lengthwise passage, a gear on the spindle, said gear being formed with a duct leading from the exterior thereof to the spindle, and power-transmitting means within the case coacting with the gear, substantially as and for the purpose described.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 11th day of November, 1905.

ALEXANDER T. BROWN.

Witnesses:
S. DAVIS,
E. K. SEEMILLER.