No. 824,969. PATENTED JULY 3, 1906.

C. ANDERSEN & R. BERTRAM.

MECHANICAL MOVEMENT.

APPLICATION FILED FEB. 23, 1906.

3 SHEETS—SHEET 1.

Fig. 1.

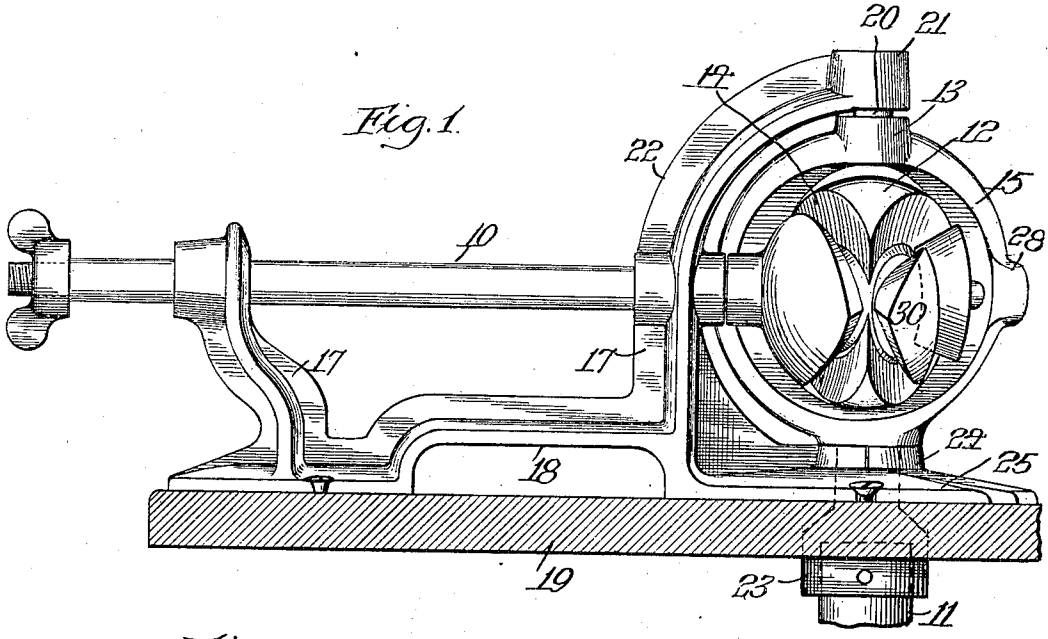


Fig. 2.

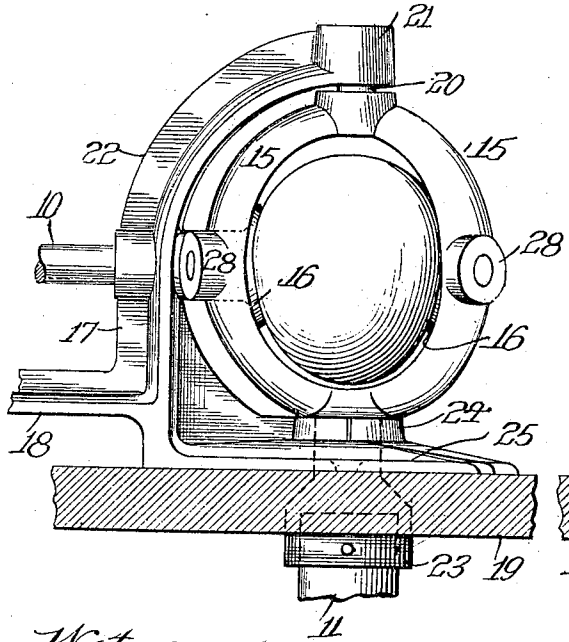
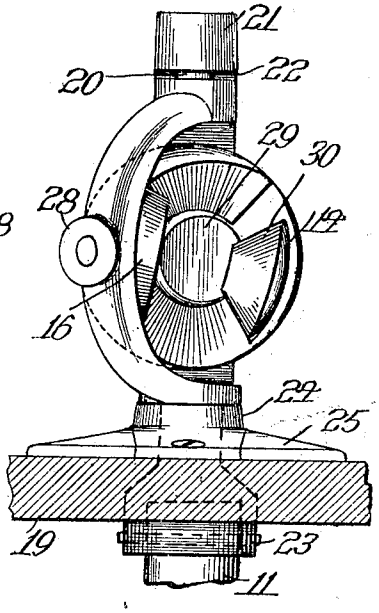


Fig. 3.



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3 SHEETS—SHEET 2.

Fig. 4

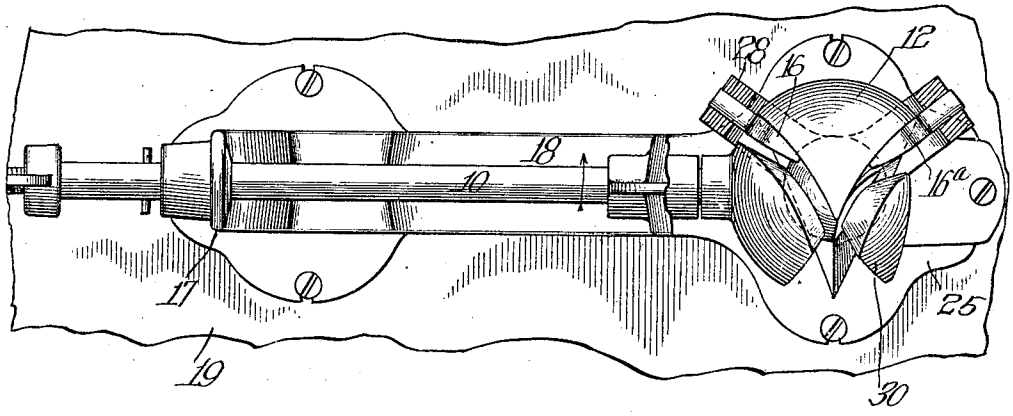


Fig. 5.

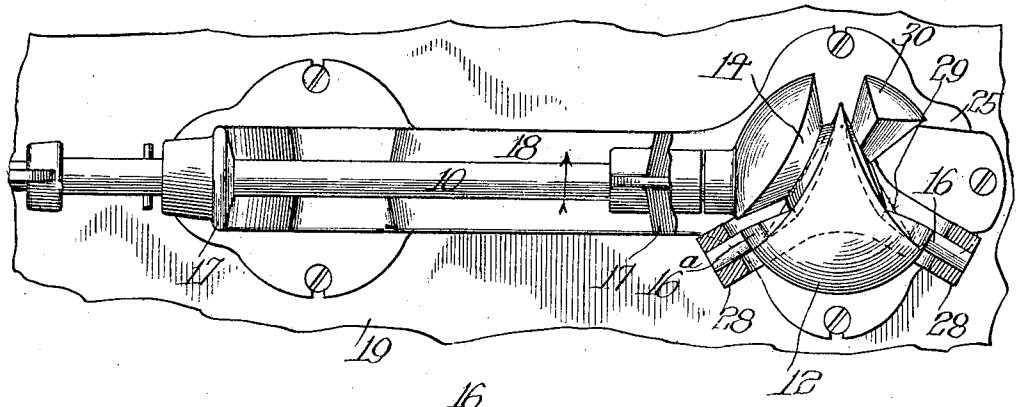
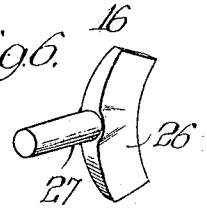


Fig. 6.



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3 SHEETS—SHEET 3.

Fig. 7.

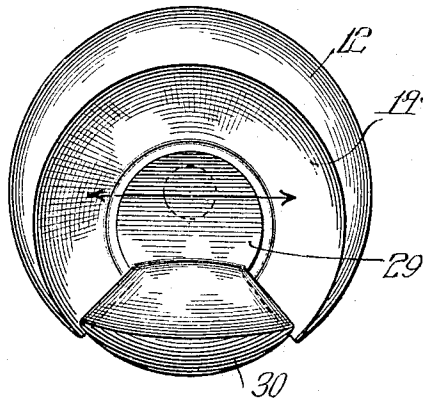


Fig. 8.

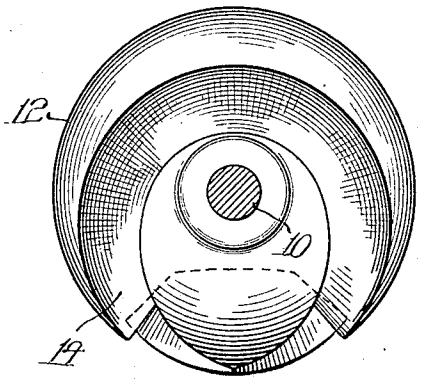


Fig. 9.

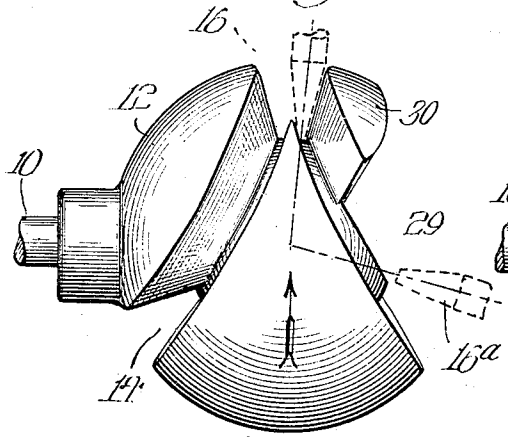


Fig. 10.

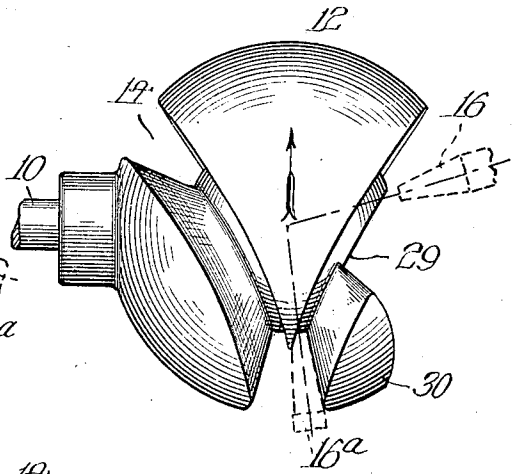
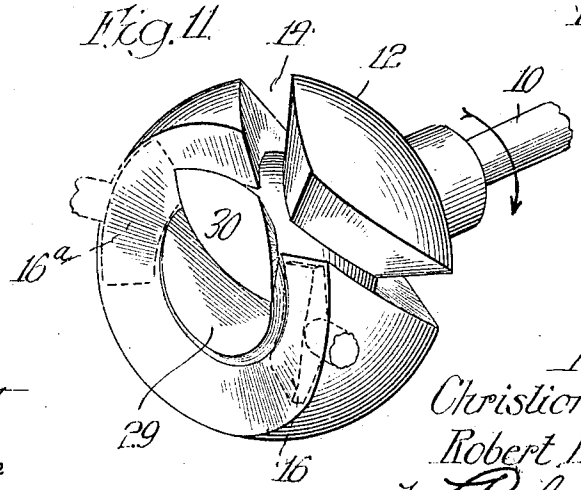


Fig. 11.



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UNITED STATES PATENT OFFICE.

CHRISTIAN ANDERSEN AND ROBERT BERTRAM, OF DAVENPORT, IOWA, ASSIGNORS TO H. F. BRAMMER MANUFACTURING CO., OF DAVENPORT, IOWA, A CORPORATION OF IOWA.

MECHANICAL MOVEMENT.

No. 824,969. Specification of Letters Patent. Patented July 3, 1906.

Application filed February 23, 1906. Serial No. 302,589.

To all whom it may concern:

Be it known that we, CHRISTIAN ANDERSEN and ROBERT BERTRAM, citizens of the United States, residing at Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Mechanical Movements; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in mechanical movements of that class wherein a rotary reciprocatory motion is imparted to one shaft from a continuously-rotative shaft arranged at an angle thereto.

The present improvements are embodied in that general class of mechanical movements wherein the continuously-rotative shaft is provided with a head having an exterior groove traversed by a shoe carried by a yoke affixed to the other shaft, said groove being of such form as to transmit rotary reciprocatory movement to the yoke and attached shaft. One form of this type of mechanical movement is shown in the prior United States Patent, No. 703,825, granted July 1, 1902.

In the accompanying illustration of our improvements we have followed generally the construction illustrated in said prior patent; but the illustrated application of our invention is to be regarded as in no wise limiting the scope and application of our invention.

Among the objects of the invention is to amplify the throw or movement of the rotary reciprocating shaft, and thereby increase its capacity for useful work to which said shaft may be adapted.

In a mechanical movement embodying our invention the yoke which moves with the rotary reciprocatory shaft is provided with two shoes that traverse the groove of the head, and the relative location of the shoes and the form of the groove are such that the shoes operate alternately to transmit motion from the head to the yoke and associated rotary reciprocatory shaft, and when one shoe is active to transmit such motion the other shoe is inoperative, but in position to become operative as soon as the shoe then operative becomes inoperative to transmit motion from the head to the yoke. In the present form of construction the head is cut away to provide a recess to receive each shoe during the inactive period of its movement, said recess being of such form and dimensions as to permit inoperative shoe to move bodily therethrough without obstructing the movement of the parts.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side elevation of a mechanical movement embodying our invention. Fig. 2 is a side elevation of the operative parts thereof, showing them in another position. Fig. 3 is a front view of said parts. Figs. 4 and 5 are plan views of the mechanism, showing the same at the opposite limits of their swing or throw. Fig. 6 is a perspective view of one of the shoes that transmit motion from the rotative head to the yoke of the reversible or rotary reciprocatory shaft. Fig. 7 is an elevation of one side of the head. Fig. 8 is an elevation of the other side of the head. Figs. 9 and 10 are plan views of the head, showing two positions thereof intermediate to the positions shown in Figs. 4 and 5. Fig. 11 is a perspective view of the head, illustrating the same in another position.

As shown in the drawings, 10 designates a horizontal continuously-rotative shaft; 11, a rotary reciprocatory shaft driven from and shown as disposed at a right angle to the shaft 10; 12, a head fixed to and rotating with the shaft 10, and 13 a yoke fixed to or carried by said shaft 11. Said head 12 is provided with an irregularly-shaped peripheral groove 14, and the yoke carries two shoes 16 16^a, which engage and traverse said groove, and by reason of the peculiar shape of the groove the continuous rotation of the head, imparted thereto by the shaft 10, is translated into a rotary reciprocatory motion in the shaft 11. As herein shown, the yoke is formed with two members 15 15, on each of which one of the shoes is rotatively mounted. The exterior groove of the head may be made of any form that will coöperate with the shoes

of the yoke to produce the desired rotary reciprocatory motion of the yoke and the shaft 11. As herein shown, said groove is made endless, and the members thereof cross or intersect to constitute two loops of the general form of a figure 8.

The horizontal shaft 10 is mounted in arms 17 17, rising from a frame 18, that is attached in any suitable manner to the support 19. The two-part yoke 13 is provided at its upper end with an integral bearing-stud 20, that engages a suitable bearing 21, formed on an extension 22 of the forward bearing-arm 17 for the horizontal shaft. The yoke is formed at its lower side to provide a bearing 23, which is socketed to receive the shaft 11, and is rotatively mounted in a suitable bearing-sleeve 24, formed on a forward extension 25 of the frame 18, before referred to. The said shoes 16 16[a] each consist of a flat or web-shaped body 26 and a shank 27, that has rotative bearing in a bearing-aperture formed in an enlargement or boss 28 of the associated yoke member.

The mechanism herein shown lends itself with peculiar adaptability to washing-machines for rotating in alternate directions the dasher of the machine, and when so adapted the shaft 11 constitutes the dasher-shaft, while the support 19 constitutes the top wall or cover of the tub of the machine.

In accordance with our invention we provide the yoke 13, constituting part of the mechanism for transmitting motion from one shaft to the other, with the two shoes 16 16[a] referred to, and, as herein shown, the yoke is composed of two angularly-separated members 15 15. Said yoke members are separated angularly from each other such distance that in each complete swing of the yoke one of the members thereof moves from its rearmost position adjacent to the bearing-arm 17 of the shaft 10 past the vertical plane of the longitudinal axis of the horizontal shaft, whereby said yoke swings through approximately one-half of a circle.

The shoes are herein shown as so disposed to each other that when the yoke is swung to one limit of its movement one of the shoes occupies one looped side of the groove, while the other shoe occupies the opposite looped side of the groove, as shown in Figs. 4, 5, 9, and 10. But one of the shoes is active at a time, however, to transmit motion from the head 12 to the yoke. The head is cut away at its portion bounded by the members of one of the loops of the groove to form a recess 29, which is occupied by one of the shoes while the other shoe is active to transmit motion from the head to the yoke.

The cutting away of the head to form the recess described removes the principal part of one of the side walls of one of the loops of the groove, so that the shoe occupying such recess is free to swing from side to side thereof, the other shoe in the meantime being active to transmit motion from the head to the yoke.

When cutting away the head within one of the looped members of the groove to form the recess 29, a part 30 thereof is retained to provide a projection at the intersection or crossing of the loops of the groove in order to properly guide the shoes to and from the active looped member of the groove.

At the time one of the shoes enters the active portion of the groove, or that portion on the side of the head not cut away, the other shoe has passed into the recess 29, and during the traverse of the shoe through said active portion of the groove said other shoe is swung bodily to and fro across said recess, as indicated by the double arrow on Fig. 7, without obstructing the movement of the parts, and in the continued rotation of the head the shoe therefore occupying said recess passes into the active portion of the groove and becomes itself active to transmit motion from the head to the yoke. As one of the shoes passes out of one end of what has been termed the "active loop" of the groove into said recess 29 the other shoe passes into the opposite end of said active loop, so that the yoke moves continuously in one direction or the other and swings in each movement approximately through one-half of a circle. It will also be observed that both members of the yoke are located on the same side of the axis of oscillation of the yoke and that in each movement of the yoke from one side to the other both shoes swing past the vertical plane of the longitudinal axis of the rotative shaft 10.

In Fig. 4 the yoke is shown as occupying one limit of its movement, while in Fig. 5 the yoke occupies the opposite limit of its movement. It will be observed that one of the shoes occupies the middle portion of the active loop of the groove when the yoke is at the limit of the swing in either direction, and it is at this point of the traverse of the shoe through said loop of the groove that the direction of swing of the yoke is reversed, while the head rotates always in the same direction, as indicated by the arrows.

Figs. 9 and 10 illustrate two positions of the head and the shoes intermediate the limits of the swing of the yoke. In Fig. 4 the shoe 16 occupies the middle portion of the active loop of the groove and the shoe 16[a] is at one side of the recess 29. In Fig. 9 the head 16 is shown as having turned half-way over, and the shoe 16 is passing out of one end of the active loop of the groove, while the shoe 16[a] has in the meantime swung bodily across the recess 29. In Fig. 10 the head has turned another half-rotation from the position shown in Fig. 9 and the shoe 16[a] has entered the active loop of the groove, while the shoe 16 has passed into the recess 29. While

said shoe 16ª is passing through the active loop of the groove the shoe 16 will swing back and forth across said recess, as indicated by the double arrow on Fig. 7, said shoe swinging from the position indicated in Fig. 10 to that indicated in Fig. 5 while the shoe 16ª passes from the entering end of the loop to the middle thereof, and, reversely, from the position indicated in Fig. 5 to that indicated in Fig. 10 while the shoe 16ª is passing from the middle of the active loop of the groove to the end thereof opposite to the end which the shoe entered. The center lines on Figs. 9 and 10 indicate the positions of the two members of the yoke in the two intermediate positions of the head. Fig. 11 is a perspective view of the head and shoes, showing the position of the latter at a point intermediate with the positions shown in Figs. 9 and 10, said view illustrating the shoe 16 as passing into the recess 29 and the shoe 16ª as passing out of said recess into the active loop of the groove. The arrangement of the parts described permits the yoke and its associated rotary reciprocatory shaft to swing through approximately one-half of a circle.

The particular angular disposition of the shoe and the form of the groove are illustrative of but one embodiment of the invention, it being understood that the invention is not limited to such embodiment except as pointed out in the specific claims hereto appended.

We claim as our invention—

1. In a mechanical movement, wherein a rotary reciprocatory motion is imparted to one shaft by the continuous rotary motion of another shaft placed at an angle thereto, operative connections between said shafts comprising a grooved head fixed to the continuously-rotative shaft, and an oscillatory yoke fixed to the rotary reciprocatory shaft and two shoes mounted on said yoke and located at one side of the axis of oscillation of said yoke, and engaging and traversing the groove of said head for the purpose set forth.

2. A mechanical movement comprising two shafts disposed at an angle to each other, one of which is adapted for continuous rotation in one direction and the other adapted to be rotated alternately in reverse directions, a grooved head on the continuously-rotative shaft, a yoke fixed to the other shaft and two shoes carried by the yoke and adapted to engage and traverse the groove of the head, said shoes being located at such angular distance apart and the groove being so formed as to impart to the yoke an oscillatory movement of approximately one-half a circle.

3. A mechanical movement comprising two shafts disposed at an angle to each other, one of which is adapted for continuous rotation in one direction and the other of which is adapted for reciprocatory rotation, a head on the continuously-rotative shaft provided with an endless groove, the members of which cross or intersect to form two loops, a yoke on the other shaft and two shoes carried by the said yoke and adapted to engage and traverse said groove.

4. In a mechanical movement, wherein a rotary reciprocatory motion is imparted to one shaft by the continuous rotary motion of another shaft placed at an angle thereto, operative connections between said shafts comprising a grooved head fixed to the continuously-rotative shaft, an oscillatory yoke fixed to the rotary reciprocatory shaft and two shoes mounted on said yoke and located at one side of the axis of oscillation of said yoke said head being provided at one side with a recess adapted to receive one of the shoes while the other shoe is traversing the groove of the head, and vice versa, for the purpose set forth.

5. A mechanical movement comprising two shafts located at an angle to each other, one of which is adapted for continuous rotation in one direction and the other of which is adapted to be rotated alternately in reverse directions, a head on the continuously-rotative shaft provided with an endless groove the members of which cross or intersect to form two loops, a yoke on the other shaft and two shoes carried by the said yoke and adapted to engage and traverse said groove, said head being cut away in the space surrounded by one of the loops to form a recess.

6. A mechanical movement comprising two shafts located at an angle to each other, one of which is adapted for continuous rotation in one direction and the other of which is adapted to be rotated alternately in reverse directions, a head on the rotative shaft provided with a groove formed to provide two loops, an oscillating yoke fixed to the other shaft and shoes mounted on the yoke and adapted to engage and traverse said groove, said head being cut away in the space surrounded by one loop to form a recess.

7. A mechanical movement comprising two shafts arranged at an angle to each other one of which is adapted for continuous rotation in one direction and the other adapted to be rotated alternately in reverse directions, a grooved head on the continuously-rotative shaft, a horizontally-swinging yoke fixed to the other shaft and provided with two shoes engaging and traversing the groove of said head, said groove being so formed that both shoes pass the vertical plane of the central axis of the head in each swing of the yoke.

8. A mechanical movement comprising two shafts located at an angle to each other, one of which is adapted for continuous rotation in one direction and the other adapted to be rotated alternately in reverse directions, a yoke fixed to the latter shaft pro-

vided with two shoes, a head fixed to the continuously-rotative shaft and provided with an exterior groove traversed by said shoes, one of said shoes being inoperative, while the other is active to transmit motion from the head to the yoke and vice versa.

In testimony that we claim the foregoing as our invention we affix our signatures, in presence of two witnesses, this 18th day of January, A. D. 1906.

CHRISTIAN ANDERSEN.
ROBERT BERTRAM.

Witnesses:
GEO. PILDING,
WM. THIBE.