

No. 781,065.

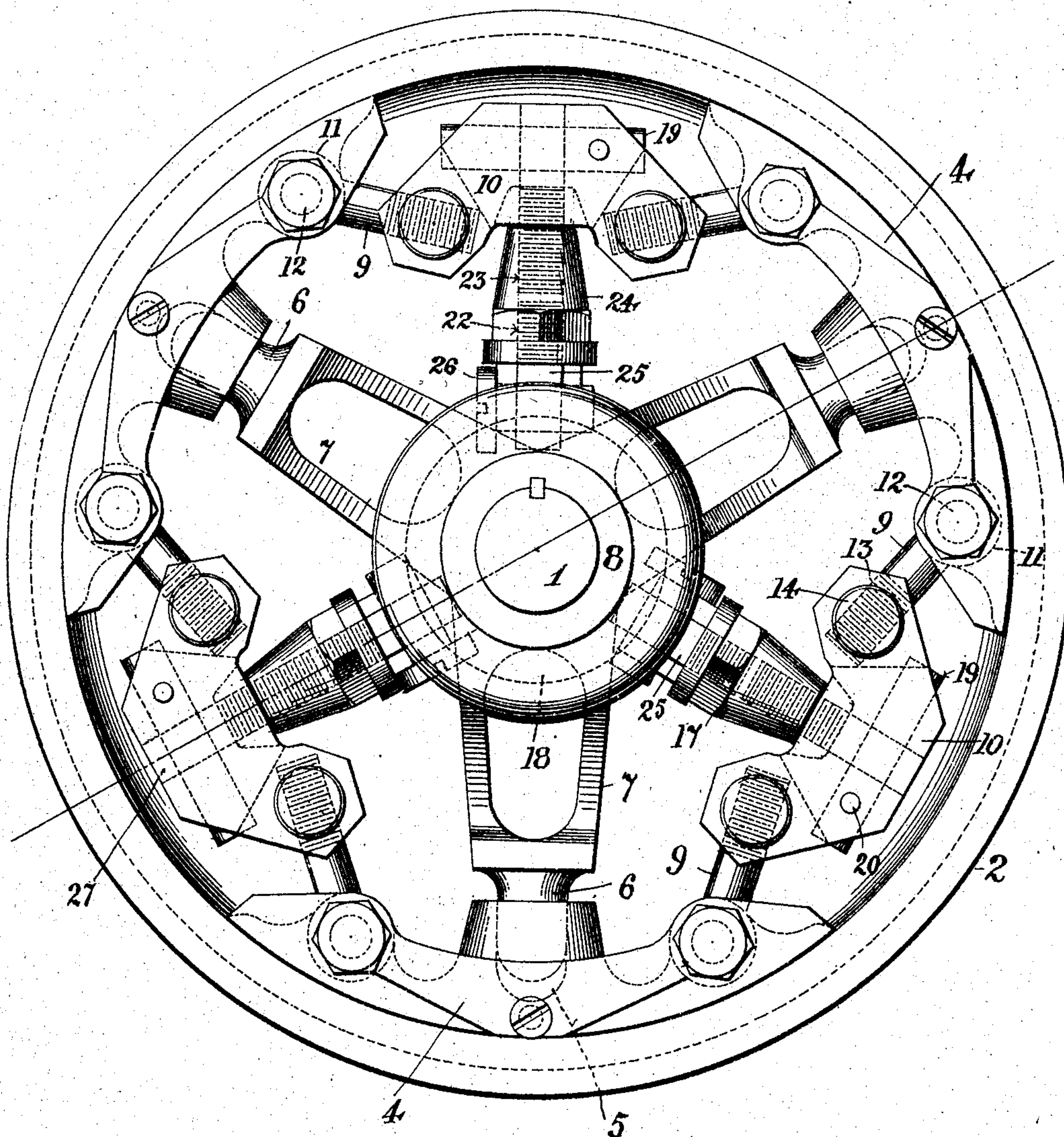
PATENTED JAN. 31, 1905.

E. R. HEWITT.
CLUTCH.

APPLICATION FILED MAR. 23, 1904.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS.—SHEET 2.

Fig. 3.

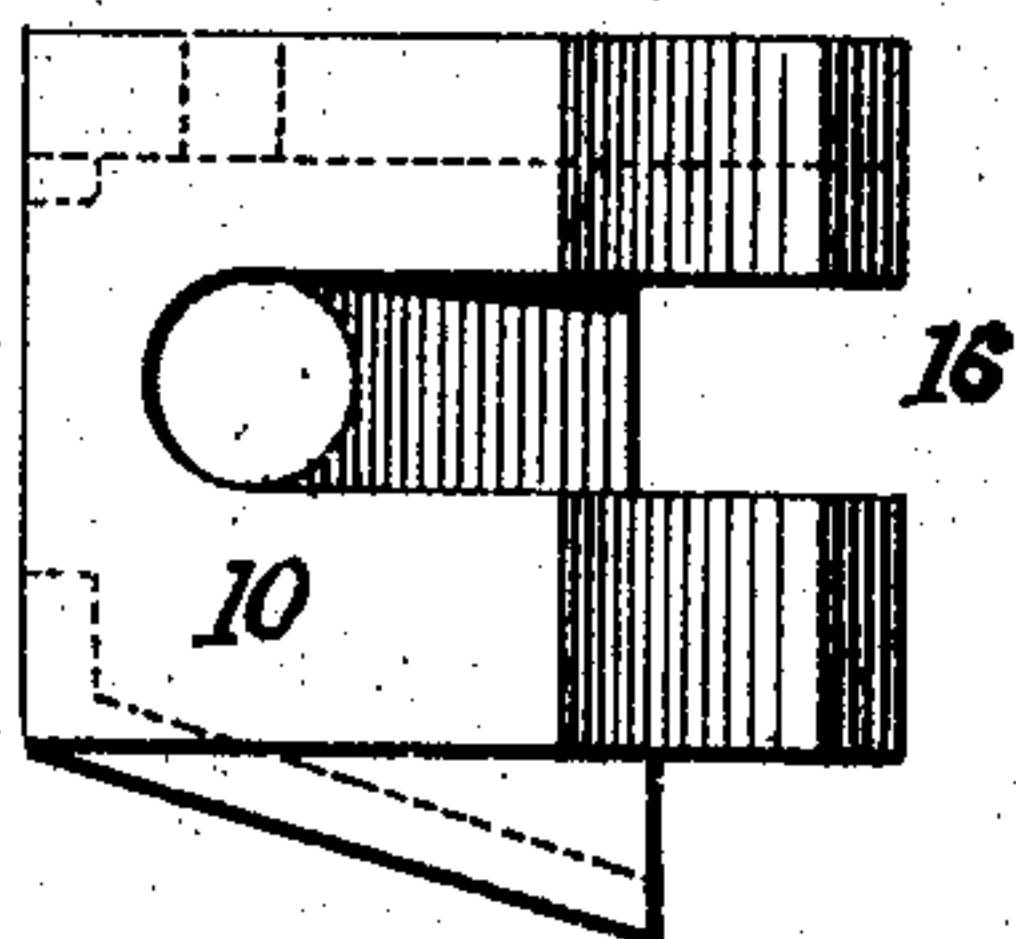


Fig. 2.

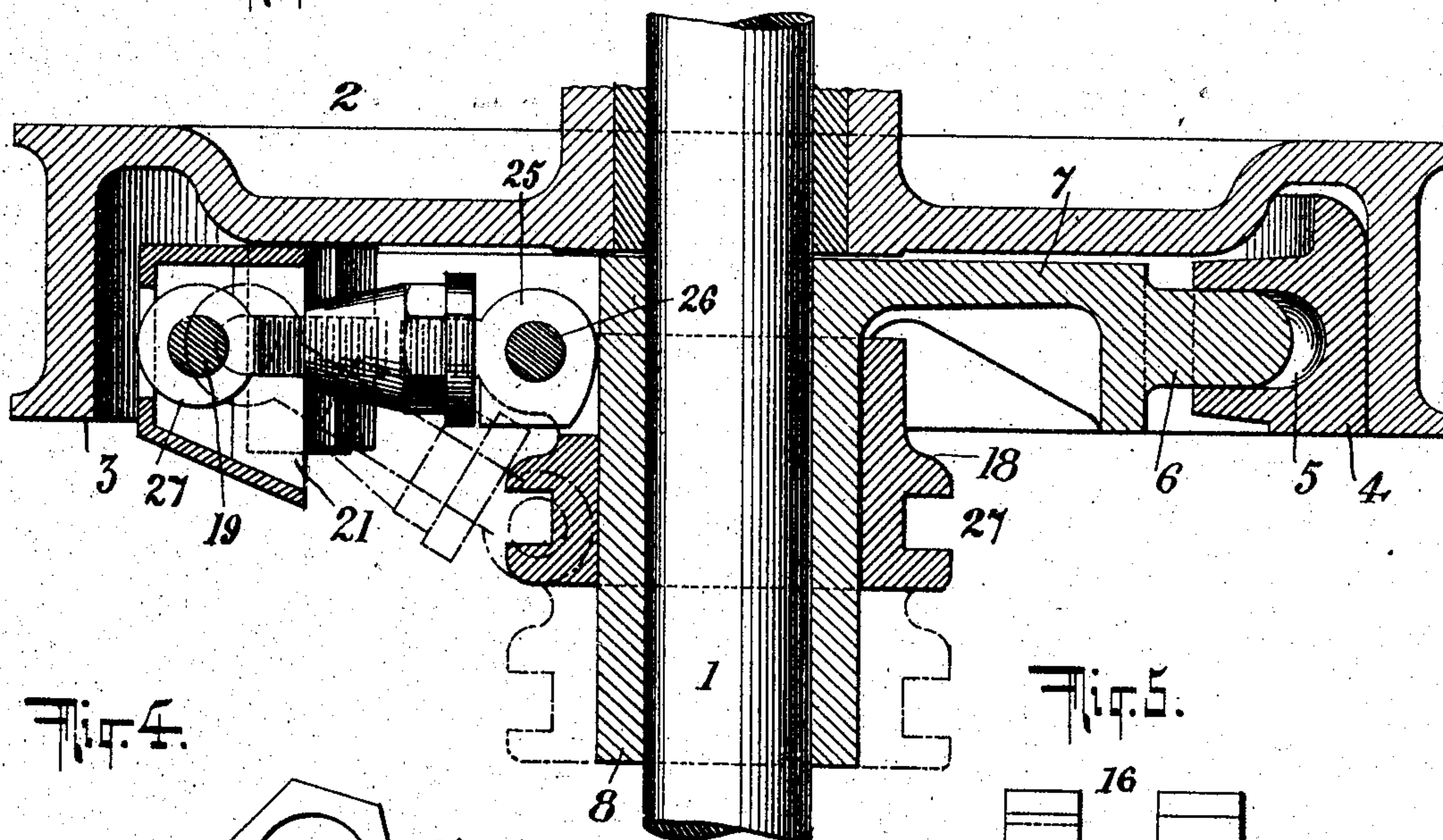


Fig. 4.

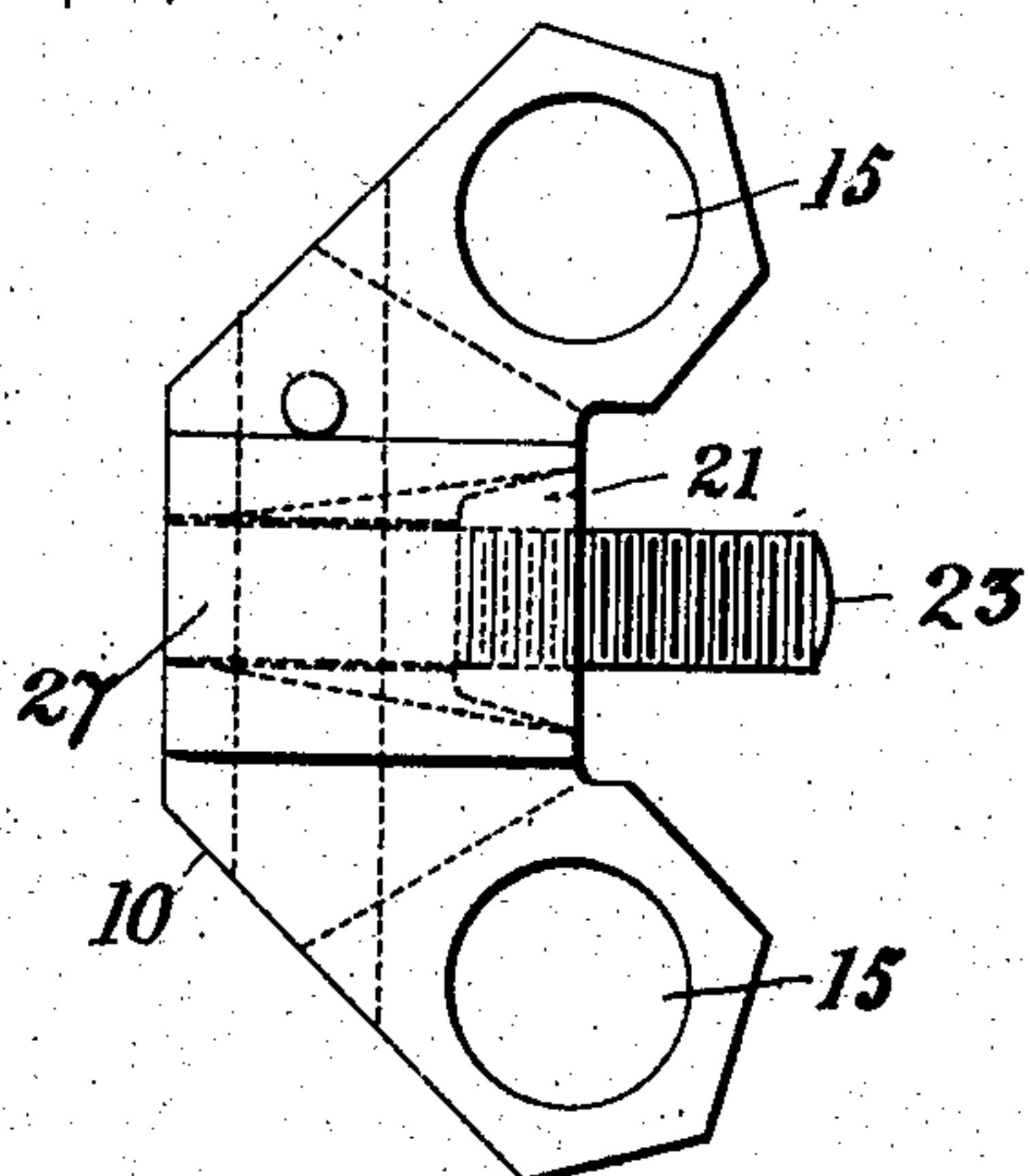
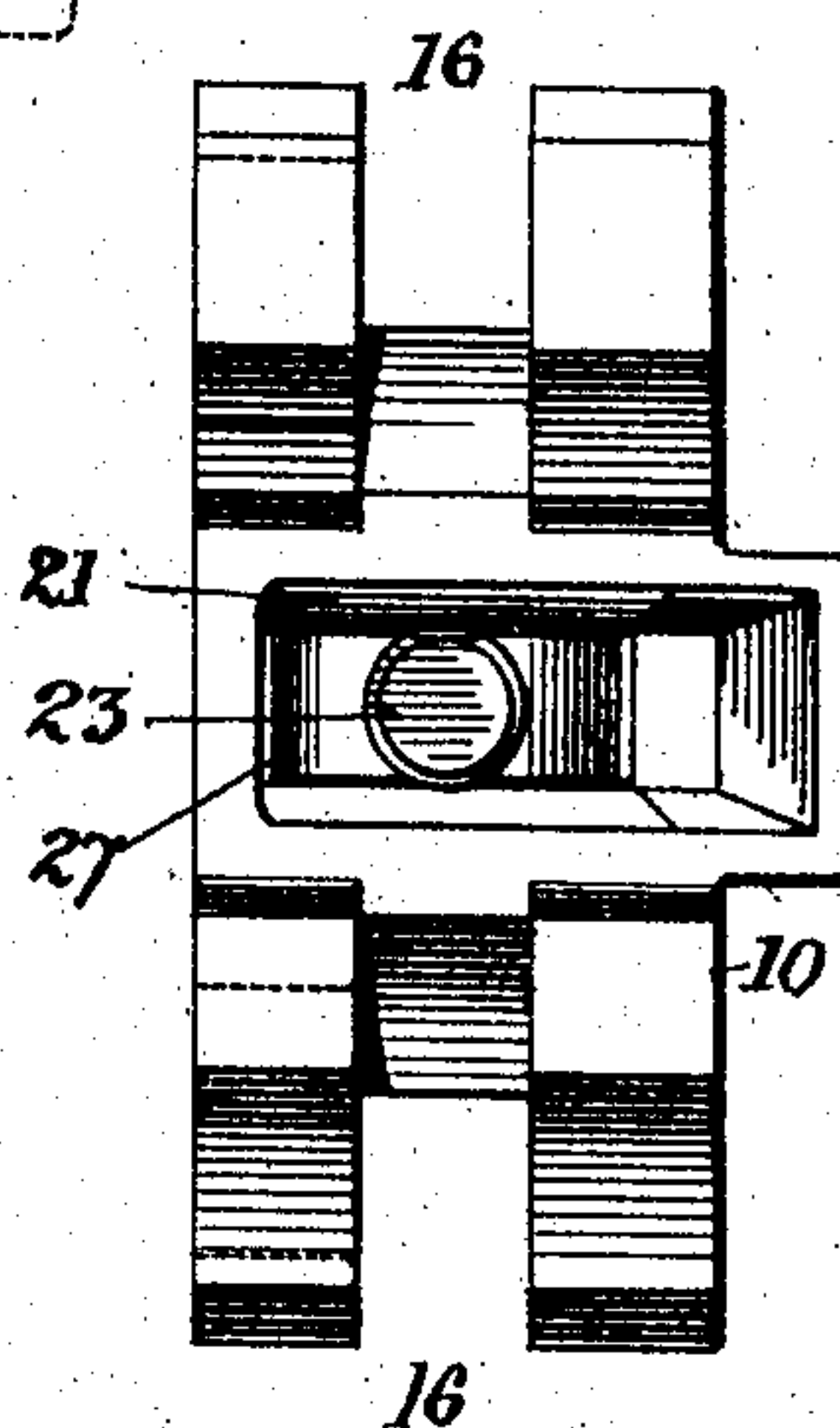


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDWARD R. HEWITT, OF NEW YORK, N. Y.

CLUTCH.

SPECIFICATION forming part of Letters Patent No. 781,065, dated January 31, 1905.

Application filed March 23, 1904. Serial No. 199,658.

To all whom it may concern:

Be it known that I, EDWARD R. HEWITT, a citizen of the United States, residing at the city of New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Clutches, of which the following is a full, clear, and exact description.

This invention relates to clutching or braking mechanisms, and particularly to those in which curved shoes are grouped within an annulus or rim and forced outwardly to grip the rim.

The object of the invention is to produce a clutch mechanism which is compact, effective, and not liable to get out of order, which can be produced at low cost, and in which the shoes may be readily set with accuracy and compensation may be easily made for wear of the several parts, particularly the shoes.

In the accompanying drawings, Figure 1 is a face view of my improved clutch mechanism, the parts being shown in the clutching position. Fig. 2 is a sectional view on the line *x x* of Fig. 1, the parts being shown in clutching position by full lines and some of the parts being indicated in released position by dotted lines. Fig. 3 is an end view, Fig. 4 is a face view, and Fig. 5 a bottom or inner side view, of a yoke which forms part of a toggle.

In the several views like parts are identified by like signs.

Upon shaft 1 is loosely mounted a wheel 2, having a rim 3, within which are located the remaining members of a tripartite clutching mechanism, whereby said wheel may be clutched to the shaft. The clutching-shoes, which are three in number, are designated as 4 and are curved to conform to the inner side of the rim 3, each shoe extending through an arc of preferably more than sixty degrees. The shoes are provided with central sockets 5, into which fit the outer ends 6 of three rigid arms 7, which radiate from a long hub or sleeve 8, keyed to the shaft 1.

The shoes may be either thrown out or withdrawn simultaneously by means of toggles which extend between the shoe ends, each toggle

connecting one shoe to the next. The toggles are similar, each consisting of a pair of links 9 and a yoke 10, each link having at its outer end an eye 11, through which passes the shank of a pivot-bolt 12, secured in the shoe. At its opposite end each link is tapped at 13 into a pivot-pin 14, of which two are employed, working in pivot-holes 15 at the ends of the yoke, said ends being slotted or forked, as at 16, Figs. 3 and 5, to receive the links. To said yokes are pivoted, respectively, three radial links 17, whose inner ends are pivoted to a collar 18, mounted to slide axially upon the sleeve 8, their outer ends being pivoted to the toggle-yokes, so that by movements of the collar along the sleeve or shaft the clutching members may be operated. Each of said radial links extends out between the yoke-pivots 14 and at its outer end is pivoted upon a pin 19, transfixed by a small securing-pin 20, said pivotal pin 19 being designedly beyond or upon the outer side of the yoke-pivots 14 and the yoke itself being centrally slotted or hollowed out at 21 to accommodate the vibratory movements of the radial link 17.

Each of the radial links 17 comprises an inner threaded stem 22, an outer threaded stem 23, and a connecting-turnbuckle 24, whereby the length of the link may be adjusted. The stem 22 has an eye 25, whereby it engages the shank of a pivot-screw 26, and the stem 23 has an eye 27 to engage the pivot-pin 19.

In setting up the mechanism adjustment of any link 9 may be effected by taking out the screw 12, slipping out the eye 11, giving the link one or more half-turns about its own axis, and then reinserting the eye in the slotted shoe and replacing the screw 12, and any of the radial links may be either lengthened or shortened by turning the turnbuckle 24. Hence the relative positions of the shoes, toggles, and links may be adjusted with exactitude, and the clutch may thereby be set or released with the least amount of motion of the parts, which is a desideratum.

The operating or controlling collar 18 may have the usual groove 27 to be engaged by a lever or other actuating device, and when moved from dotted-line to full-line position

at Fig. 2 the radial links are moved simultaneously from the inclined dotted-line position to the upright full-line position, the pivots 19 at the outer ends of said links being accordingly thrust out, together with the yokes 10, thus thrusting out the toggle-links 9 and setting the shoes 4 into engagement with the rim 3, so that wheel 2 and shaft 1 are caused to rotate together. By moving the collar 18 back to the dotted-line position the clutch is released.

It will be observed that by the construction of a tripartite mechanism of the class described each of the clutching-shoes may be sufficiently short to be effective throughout its length, while a larger portion of the clutching-rim is rendered effective than heretofore. It will be understood that where only two shoes are included in a set they must be either so long as to be objectionable or so short that their combined gripping power is insufficient for many purposes, unless they are subjected to such pressure as to be destructive. There exist two objections to an undue length of shoe, one being that it is not uniformly effective, some portions binding too much and others too little, and the other being on account of the very great movement of the shoe, which is highly objectionable, this movement being necessary, because the sides of the shoes move nearly in parallelism with or only at very slight angles to the adjoining portions of the clutching-rim. There is usually room for but limited movements of the shoes, and, moreover, a slight movement of the shoe entails a long movement on the clutch-controlling lever, which is undesirable. By making the three shoes each about eighty degrees in extent, as shown, a slight movement is sufficient to separate the entire shoe from the rim, while the different portions of the shoe bind with substantially equal pressure upon the rim, and so much of the latter is put into effective use that the pressure upon each shoe need not be excessive, thus conducing to reliability and long life of the mechanism.

In addition to the advantages already enumerated it will be seen that a highly-effective clutch can be compacted into a very small space, this result being due in considerable measure to the fact that the three radial links occupy positions between the three shoe-carrying arms 7. By pivoting the radial links at the outer side of the toggle-yokes a two-fold advantage is gained, one arising from the fact that the yoke is caused to act as a draw-link upon the toggle-links 9, thereby tending to maintain the several parts in their proper relations or alinement, and the other arising from the fact that by placing the radial link between the yoke-pivots 14 room is afforded for the necessary portions of the extensible radial link, particularly the turnbuckle. In other words, by providing for the

use of a sufficiently long radial link said link may be made of such construction that its length may be adjusted, the shoes and rim being thus brought close to the shaft, although the link reaches nearly from the shaft to the rim.

Having described my invention, I claim—

1. A clutch mechanism comprising a set of shoes, means connecting each shoe to the next and comprising a pair of toggle-links and an intervening yoke to which said links are separately pivoted, a radial link passing between and outwardly beyond the link-pivots in each yoke and pivoted at its outer end to the yoke, and a common controlling member to which the inner ends of the radial links are pivoted.

2. A tripartite clutch mechanism comprising three shoes, three rigid arms carrying said shoes, means connecting each shoe to the next and comprising a pair of toggle-links and a yoke to which said links are separately pivoted, radial links, and a member to which said radial links are pivoted at their inner ends, each of the radial links extending outwardly beyond the toggle-links and being pivoted at its outer end to said yoke, which connects the toggle-links.

3. A clutch mechanism comprising a set of shoes, a set of toggles whereby the shoes are connected, each toggle comprising a pair of links and a yoke to which the links are separately pivoted, radial links, and a central member to which the radial links are pivoted at their inner ends, each radial link passing between the link-pivots of the toggle-yoke, and being pivoted at its outer end to said yoke, and also being constructed between its ends with means whereby its length may be adjusted.

4. A tripartite clutch mechanism comprising three shoes, three rigid arms whereon said shoes are carried, three toggles whereby the shoes are connected, each toggle comprising a pair of links and a yoke, said links having eyes whereby they are pivoted to the shoes, and said yokes having pivots into which the opposite ends of said links are tapped, three radial links, and a central member to which the inner ends of the radial links are pivoted, each radial link extending out between the toggle-links and being pivoted at its outer end to the yoke beyond the toggle-pivots, and comprising two stems and a turnbuckle.

5. A tripartite clutch mechanism comprising three shoes having central sockets, three rigid arms having extremities which fit in said sockets, three toggles whereby the ends of the shoes are connected, each toggle comprising a pair of links and a yoke, each link being threaded at one end and having at the other end an eye whereby it is pivoted to the end of the shoe, and each yoke being formed with slotted ends or forks to receive the shanks of said links, and also with pivots into

which said shanks are tapped, three radial
links, and a central collar to which the inner
ends of the radial links are pivoted, each ra-
dial link extending out between said yoke-
5 pivots and being pivoted at its outer end to
the yoke beyond said pivots, and comprising
two stems and a turnbuckle.

In witness whereof I subscribe my signature
in presence of two witnesses.

EDWARD R. HEWITT.

Witnesses:

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WALDO M. CHAPIN.