

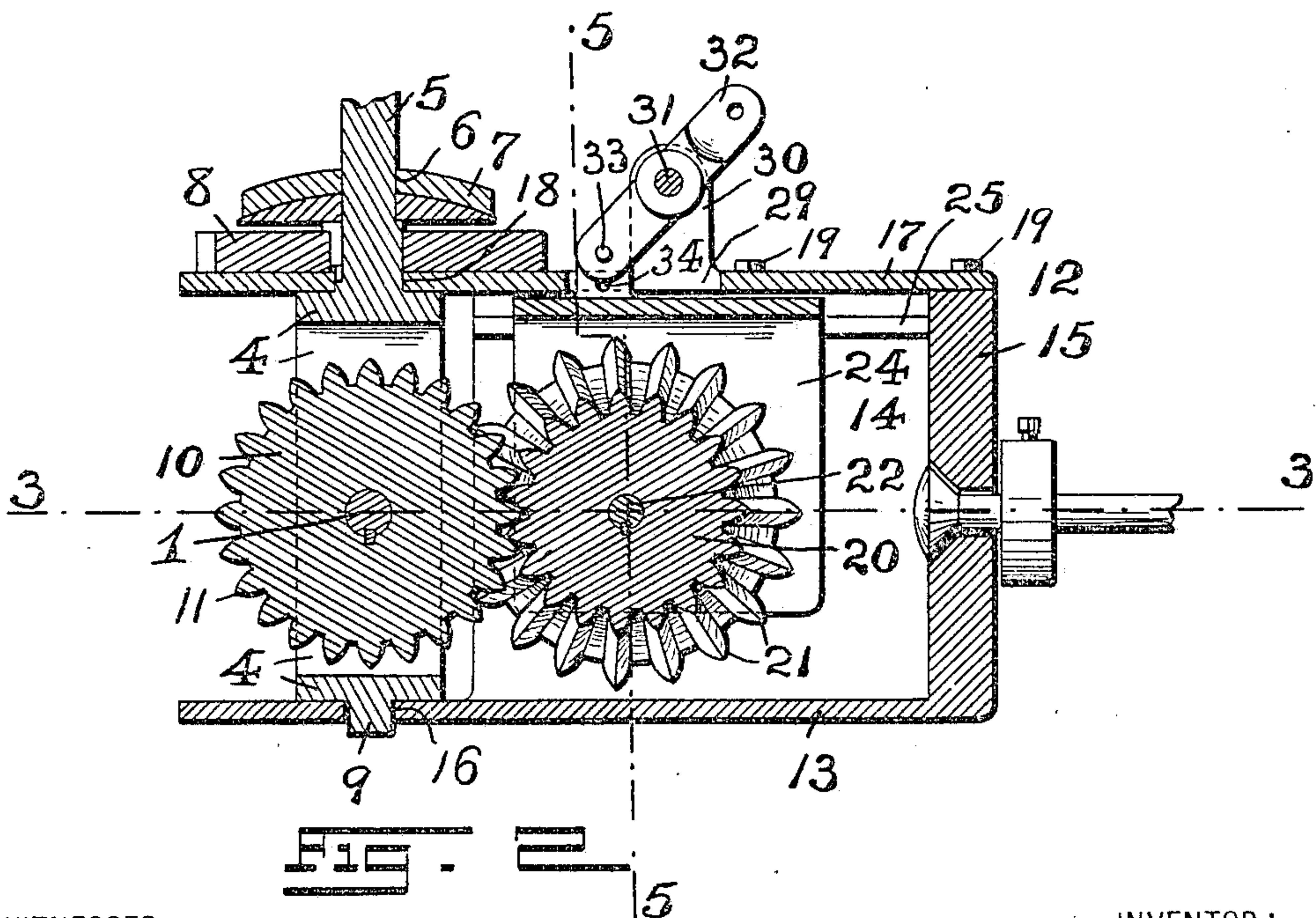
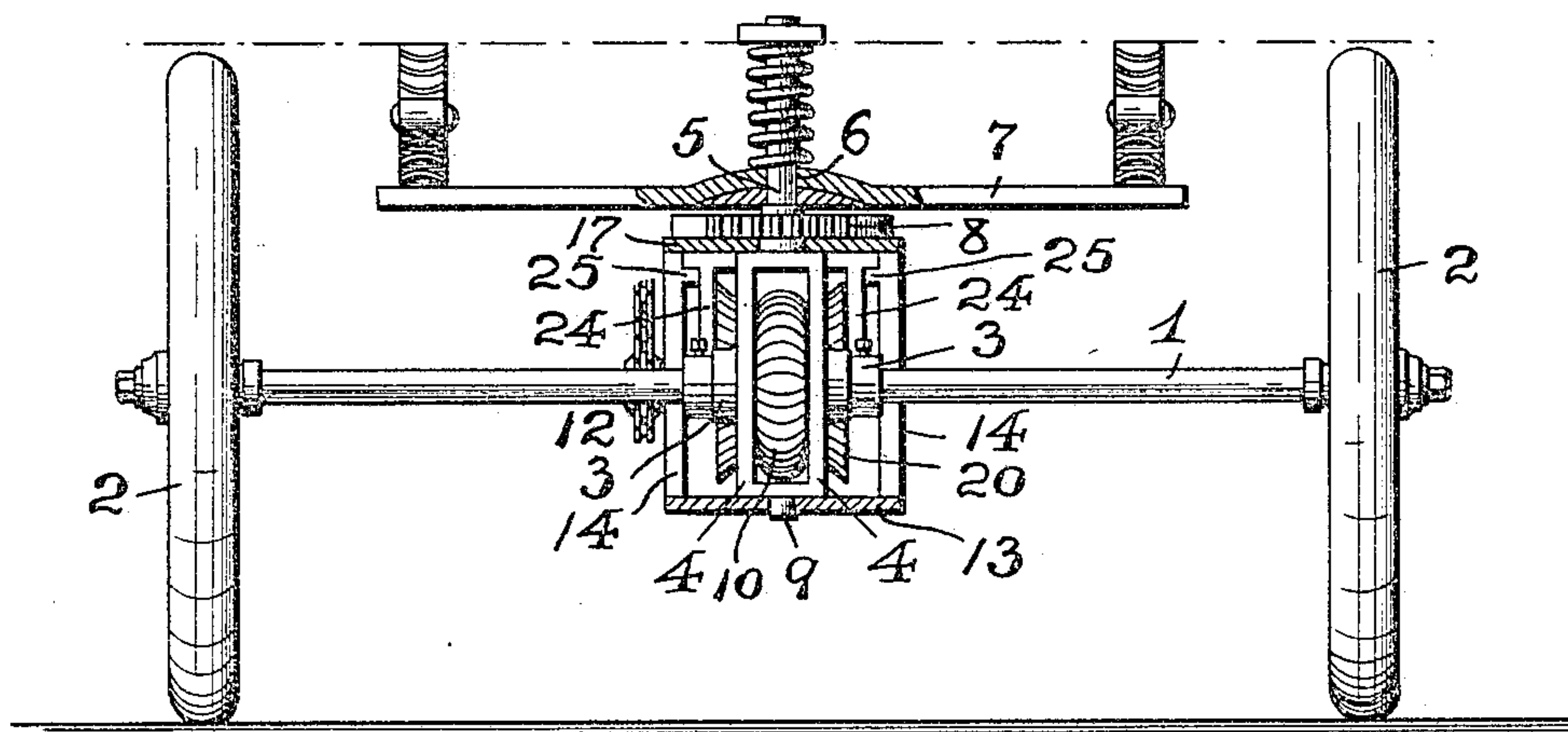
S. H. HANSON.

GEARING.

APPLICATION FILED AUG. 3, 1904.

2 SHEETS—SHEET 1.

FIG. 1



WITNESSES:

Geo. D. Richards
 W. B. Fraentzel

INVENTOR:

Stephen H. Hanson,

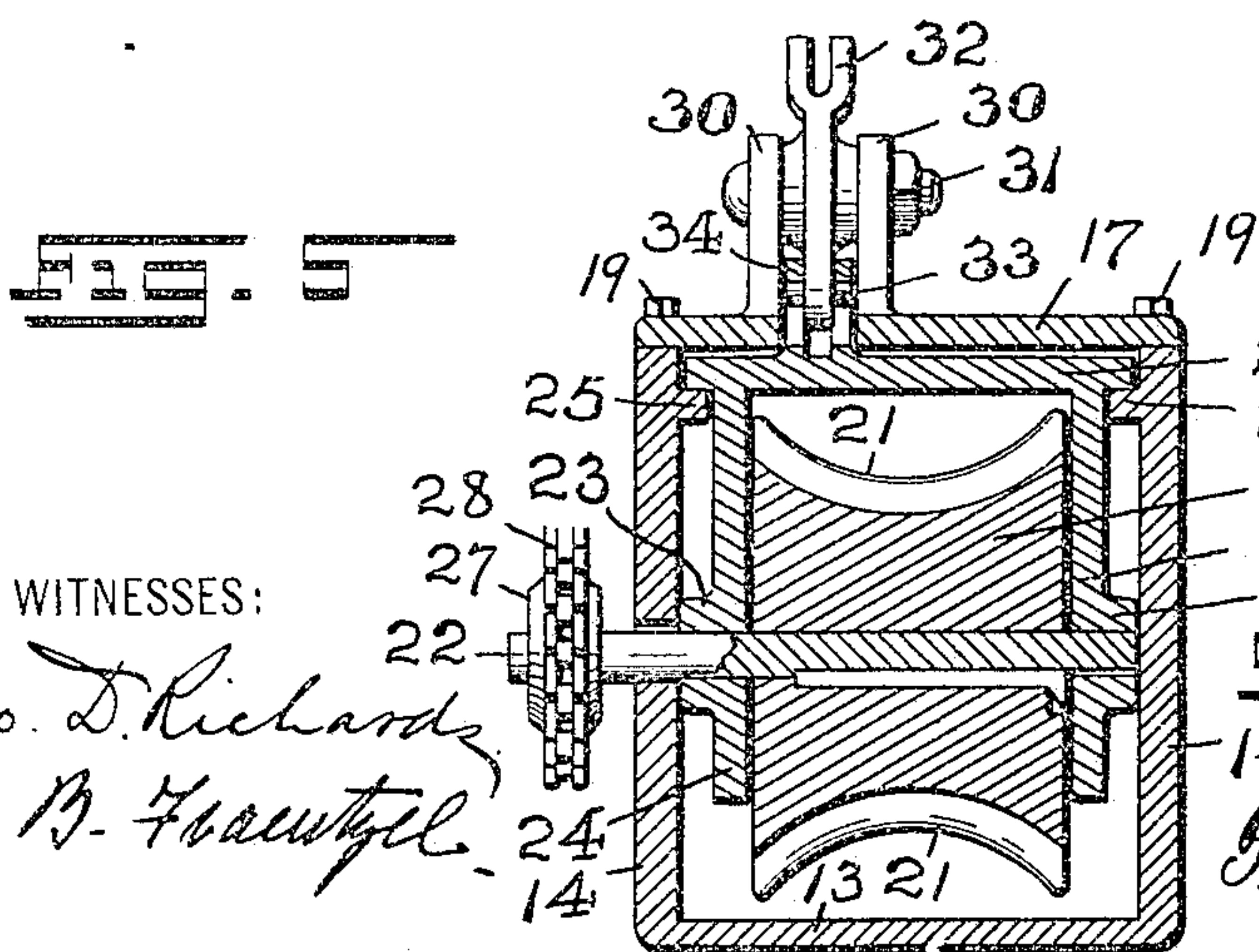
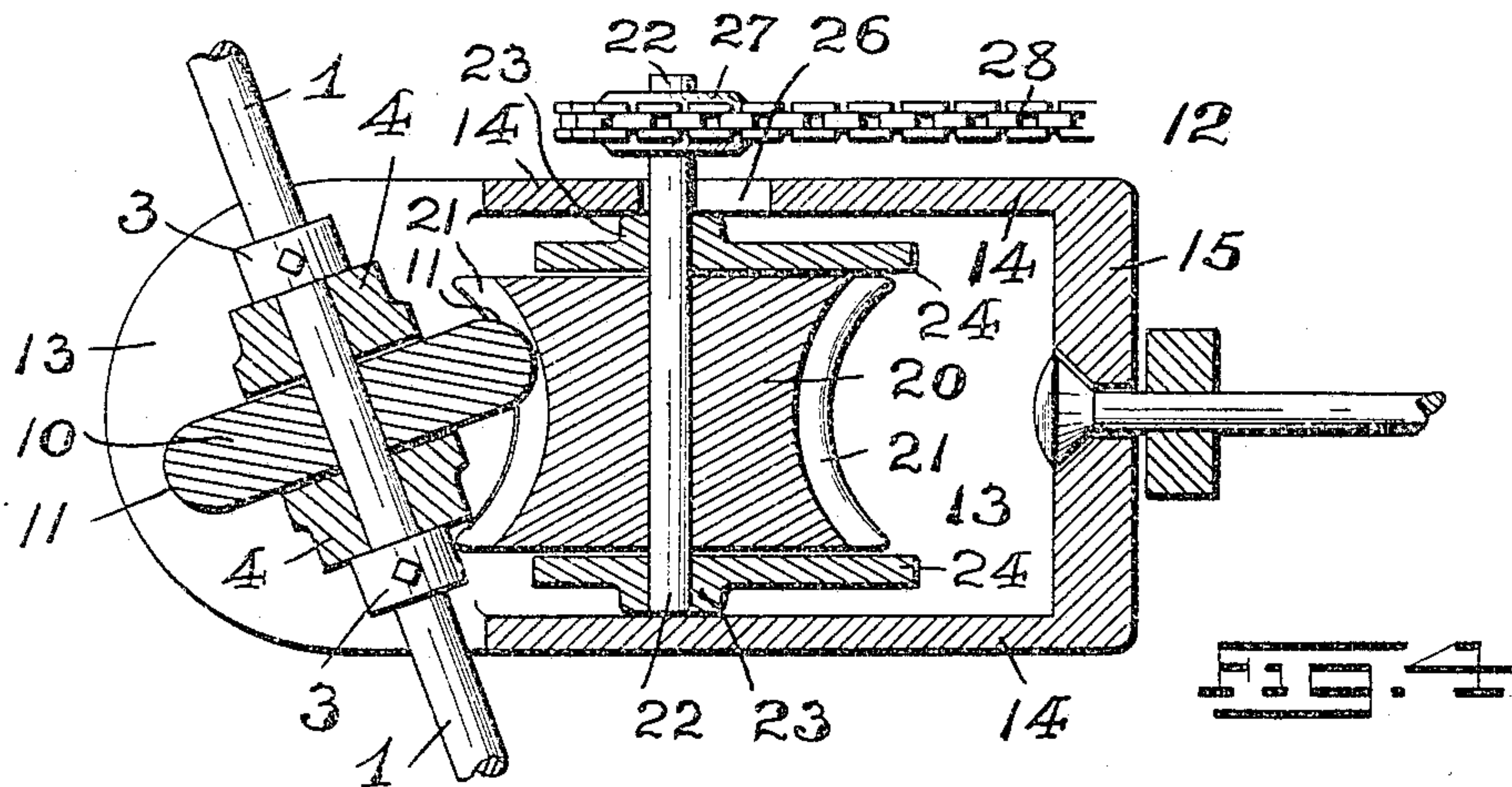
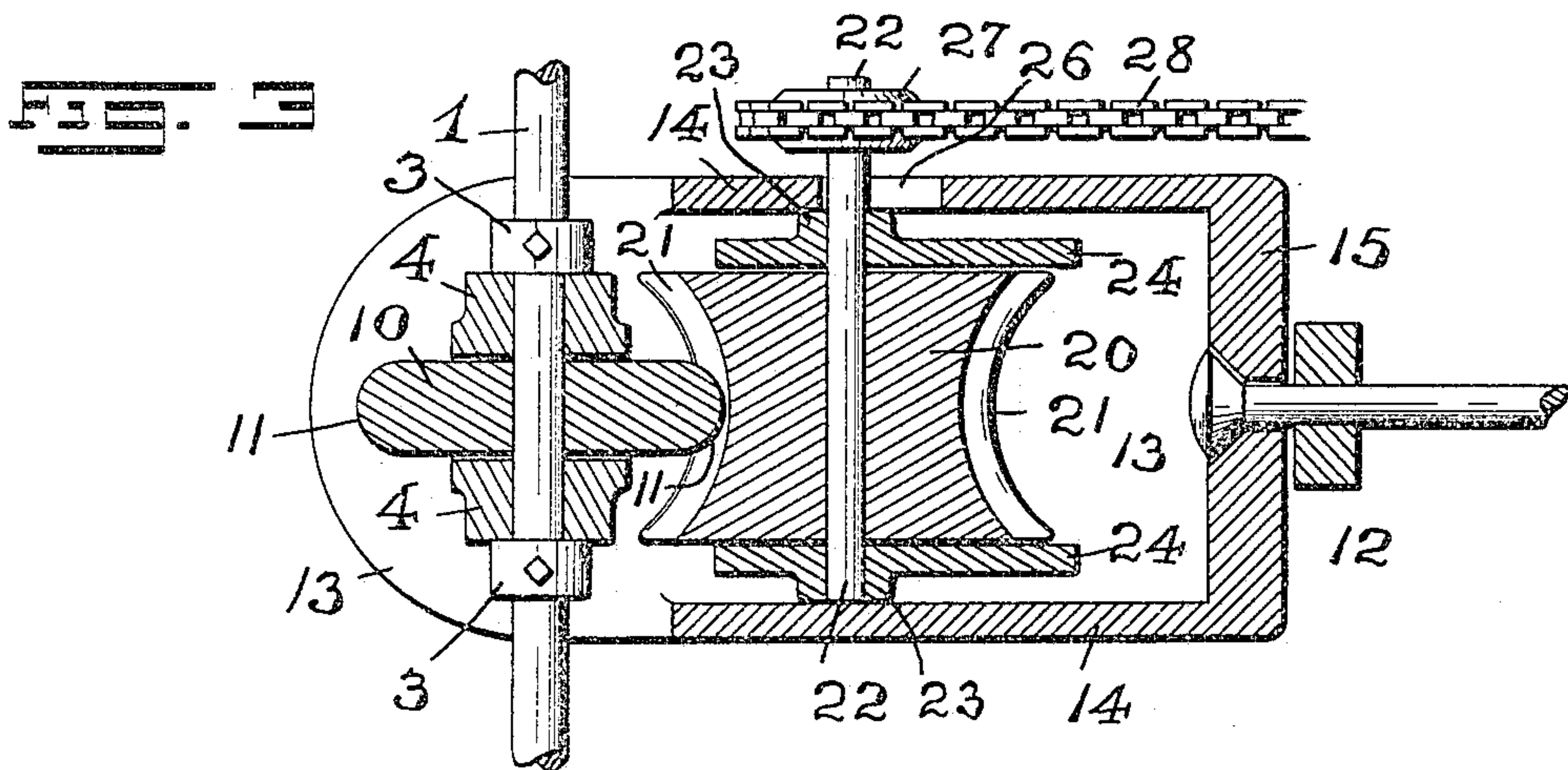
BY
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2 SHEETS—SHEET 2.



WITNESSES:

Geo. D. Richards
H. B. Fraentzel

INVENTOR:

Stephen H. Hanson,
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UNITED STATES PATENT OFFICE.

STEPHEN H. HANSON, OF AKRON, OHIO.

GEARING.

SPECIFICATION forming part of Letters Patent No. 787,330, dated April 11, 1905.

Original application filed May 10, 1904, Serial No. 207,236. Divided and this application filed August 3, 1904. Serial No. 219,259.

To all whom it may concern:

Be it known that I, STEPHEN H. HANSON, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Gearing; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to numerals of reference marked thereon, which form a part of this specification.

This invention has reference to improvements in gearing; and the invention is in the nature of a division of the matter set forth in my previous application for Letters Patent for improvements in power-transmission for motor-vehicles, filed May 10, 1904, Serial No. 207,236.

My present invention has for its principal object to provide a novel construction and form of gearing comprising intermeshing gears or toothed wheels, one of which in addition to its rotary motion about its central axis is capable also of a horizontal or lateral movement during such rotary motion without the disengagement of the gear-teeth of the respective gears, whereby the gearing can be used with a revolving shaft, which also has a rotary motion about a pivotal post or other similar support.

A further object of this invention is to provide, in connection with gearing of the character hereinafter more fully set forth, a supporting frame or box therefor and a means for forcing the gears out of mesh.

The invention consists in the novel gearing hereinafter set forth; and, furthermore, this invention consists in the arrangement and combinations of the various parts, as well as in the details of the construction of the same, all of which will be fully described in the accompanying specification and then finally embodied in the clauses of the claim.

By my invention I have provided a novel gearing which is especially adapted for use with the front axle of a motor-vehicle to enable the use of a revolving axle, which is movable horizontally about a king-bolt.

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a front view of the front axle of a vehicle and its wheels, showing in end elevation the novel gearing and its frame in operative relation with the said axle. Fig. 2 is a central longitudinal section of the gearing and its frame. Fig. 3 is a horizontal sectional representation of the same, the said section being taken on line 3 3 in said Fig. 2, showing the intermeshing gears with their axes in parallel alinement; and Fig. 4 is a similar sectional representation showing the two gears in a different angular relation from that represented in said Fig. 3. Fig. 5 is a transverse vertical section taken on line 5 5 in Fig. 2.

Similar characters of reference are employed in the above-described views to indicate corresponding parts.

In the said drawings the reference character 1 indicates a revolving shaft or axle, that in the present case representing the front axle of a suitable vehicle, the said axle or shaft being provided with wheels 2, substantially as illustrated in Fig. 1 of the drawings. Suitably arranged upon the said axle or shaft, preferably between a pair of collars 3 or other devices for preventing lateral movement upon said axle or shaft, is an open frame 4, provided with a king-post 5, which extends through a bearing 6 in a cross-bar or spring-support 7, to be suitably secured to the body of the vehicle in any well-known manner. The said king-post 5 may also be provided with a pinion 8 for producing a horizontal rotary motion of said open frame 4; but of course it will be evident that any other means for turning the said king-post may be employed. Upon its lower portion the said frame 4 may be provided with a pivot projection or stud 9. Suitably secured upon the said axle or shaft 1 in the opening formed by the frame 4 is a gear-wheel 10, which is provided with gear-teeth 11, having circular or convex marginal edges, the said edges being also preferably of a sharp or knife edge configuration, substantially as illustrated in the several figures of the drawings. The driving-gear in mesh with the said gear 10 is arranged in a suitable support, box, or frame 12, which

is made, preferably, in the manner illustrated in Figs. 2, 3, 4, and 5 of the drawings, the said support comprising a base 13, a pair of sides 14, and a back 15. The said base 13 is provided with a suitable perforation 16, in which the pivot or stud 9 is arranged so as to turn therein, and the king-post 5 of the frame 4 extends through a perforation 18 in an upper plate 17, which is suitably secured upon the upper edges of the sides 14 and the back 15 by means of bolts or screws 19 or other fastening means, as will be understood. It will thus be seen from an inspection of Fig. 2 of the drawings that the said open frame and its gear 10 are capable of an oscillatory movement between the said base 13 and the top or upper plate 17 of the support 12. The said support, box, or frame 12 may be provided with any fastening means for securing it in its suspended position beneath the body of a vehicle or other body. The said driving-gear is indicated by the reference character 20 and it is provided with concaved gear-teeth 21, so as to permit of the horizontal rotary or swinging movement of the axle or shaft 1 without forcing the gears 10 and 20 from their operative engagement. The gear 20 is affixed to a shaft or spindle 22, rotating in suitable bearings 23, connected with a frame 24, preferably of such construction that it can slide or reciprocate upon ways or guides 25, extending from the inner faces of the sides 14 and upon which the said frame is supported. The one end of the said shaft 22 is made to extend through an elongated hole or opening 26 in one of said sides 14, and upon the free end of said shaft 22 is a driving means 27, such as a sprocket and chain 28, for producing a rotary motion of the shaft 22 and its gear 20. That the said gear 20 may be thrown in and out of mesh with the gear 10 the said box, frame, or support 12 is provided in its top or upper plate 17 with an opening 29 and a pair of posts 30, having a pin 31, upon which is arranged an oscillating lever or arm 32. The lower end portion of said lever or arm 32 has a pin 33, movably arranged in a slotted post or lug 34, which is connected with the sliding frame 24, the said post or lug 34 extending into and through the said opening 29 and being slidably arranged in said opening when the said arm or lever 32 is oscillated by a suitable actuating means which may be operatively connected with the upper end of said arm or lever 32 in any suitable manner, and may be operated from any desired point outside of the said box, frame, or support 12.

From the foregoing description of this invention it will be seen that I have devised a simple and operatively-constructed gearing for the transmission of power from one shaft or axle to another shaft, no matter whether the shafts are parallel with each other or

whether said shafts are in changeable or variable angular arrangement to each other.

I am aware that changes may be made in the arrangements and combinations of the parts as well as in the details of the construction of the same without departing from the scope of my present invention. Hence I do not limit my invention to the exact arrangements and combinations of the various parts as described in this specification and as illustrated in the accompanying drawings, nor do I confine myself to the exact details of the construction of the said parts.

Having thus described my invention, what I claim is—

1. The combination, with a pair of revolving shafts, one of said shafts being capable of variable angular relation to the other shaft, a gear on each shaft, said gears having gear-teeth in operative mesh irrespective of the varying angular relations of one shaft to the other shaft, and means for forcing said gears from their operative mesh, substantially as and for the purposes set forth.

2. The combination, with a pair of revolving shafts, one of said shafts being capable of variable angular relation to the other shaft, a gear on each shaft, the teeth of one of said gears being concave and the teeth of the other gear being convex, and said gears having their gear-teeth in operative mesh irrespective of the varying angular relations of one shaft to the other shaft, and means for forcing said gears from their operative mesh, substantially as and for the purposes set forth.

3. In a gearing, the combination, with a main frame having bearing portions, of a second frame provided with a pivotal stud and king-post arranged in said bearing portions, said second frame being capable of oscillatory movement in said main frame, a shaft revoluble in bearing portions in said second frame, a gear on said shaft, said gear being arranged between the sides of said second frame, a shaft revoluble in bearings in said main frame, and a gear on said shaft, said gears having their gear-teeth in operative mesh irrespective of the varying oscillatory movements of said second frame and its shaft, substantially as and for the purposes set forth.

4. In a gearing, the combination, with a main frame having bearing portions, of a second frame provided with a pivotal stud and king-post arranged in said bearing portions, said second frame being capable of oscillatory movement in said main frame, a shaft revoluble in bearing portions in said second frame, a gear on said shaft, said gear being arranged between the sides of said second frame, a shaft revoluble in bearings in said main frame, a gear on said shaft, said gears having their gear-teeth in operative mesh irrespective of the varying oscillatory movements of said second frame and its shaft, and means for

forcing said gears from their operative mesh, substantially as and for the purposes set forth.

5. In a gearing, the combination, with a main frame having bearing portions, of a second frame provided with a pivotal stud and king-post arranged in said bearing portions, said second frame being capable of oscillatory movement in said main frame, a shaft revoluble in bearing portions in said second frame, a gear on said shaft, the teeth of said gear being convex, and said gear being arranged between the sides of said second frame, a shaft revoluble in bearings in said main frame, and a gear on said shaft, the teeth of said gear being concave, both gears having their gear-teeth in operative mesh irrespective of the varying oscillatory movements of said second frame and its shaft, substantially as and for the purposes set forth.

6. In a gearing, the combination, with a main frame having bearing portions, of a second frame provided with a pivotal stud and

king-post arranged in said bearing portions, said second frame being capable of oscillatory movement in said main frame, a shaft revoluble in bearing portions in said second frame, a gear on said shaft, the teeth of said gear being convex, and said gear being arranged between the sides of said second frame, a shaft revoluble in bearings in said main frame, and a gear on said shaft, the teeth of said gear being concave, both gears having their gear-teeth in operative mesh irrespective of the varying oscillatory movements of said second frame and its shaft, and means for forcing said gears from their operative mesh, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 30th day of July, 1904.

STEPHEN H. HANSON.

Witnesses:

MAUD MAUTERSTOCK,
JOSIE BONNELL.