

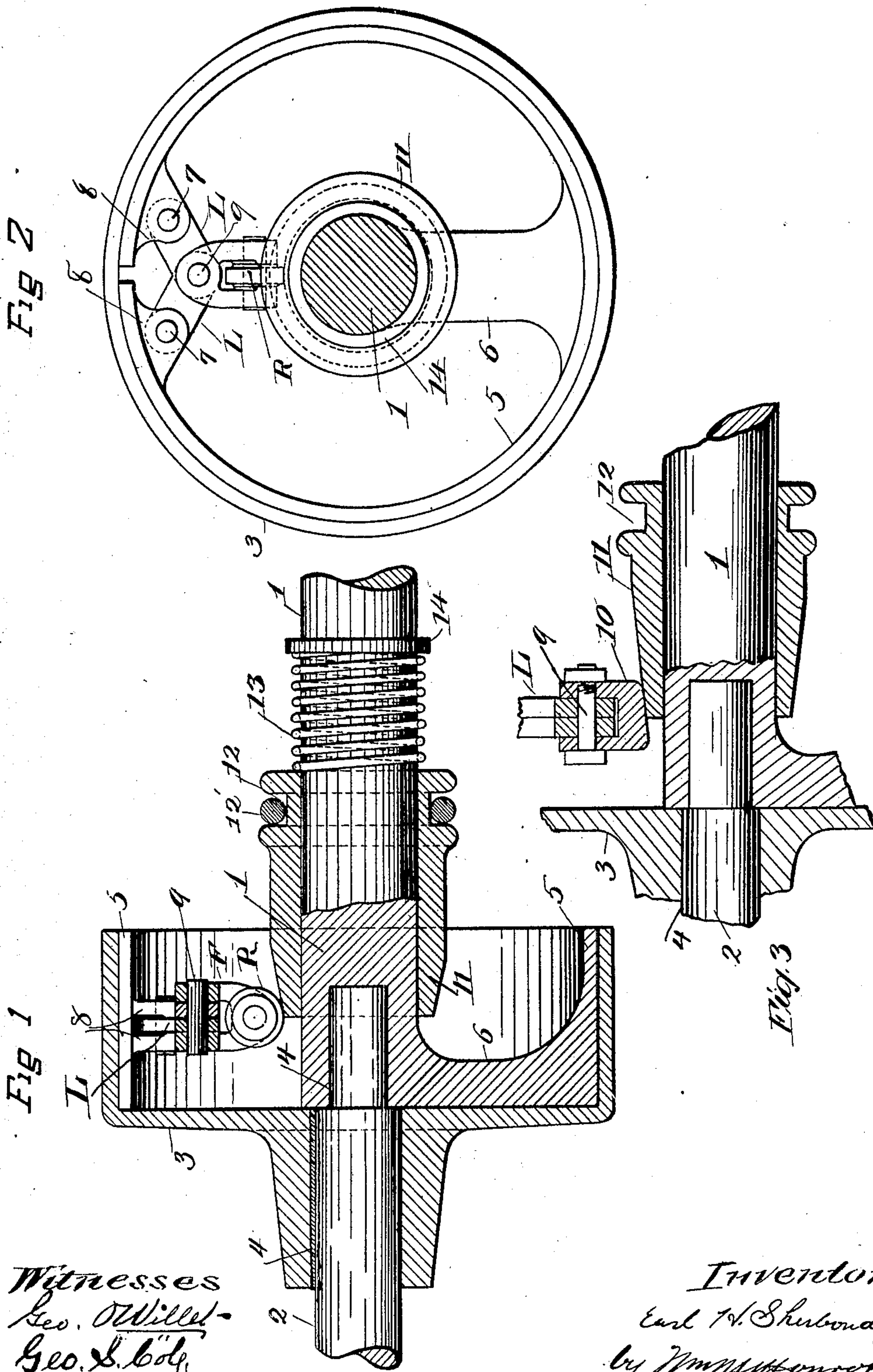
E. H. SHERBONDY.

CLUTCH.

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912,741.

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UNITED STATES PATENT OFFICE.

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CLUTCH.

No. 912,741.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EARL H. SHERBONDY, a citizen of the United States, and resident of Cleveland, county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Clutches, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of the invention are to provide a form of clutch for a divided shaft, such as the driving shaft of an automobile, in which in its normal condition the coupling will be made and can easily be released, and in which no irregularity in the action of the working parts will cause binding or objectionable friction thereof upon each other.

The invention comprises a form of construction in which a fly wheel is secured to one portion of the shaft and an expansible split ring adapted to bear upon the inner surface of the fly wheel is secured to the other portion of the shaft, and in which connected toggle arms and a longitudinally moving cone upon the shaft are employed to separate the sides of the expansible ring, and to force them into engagement with the wheel surface.

Heretofore, various means have been employed to expand the sides of an expansible ring, and a radially moving block in which the inner ends of the toggle arms have been pivoted has been employed in connection with lever mechanism for forcing this block outwards. Pivoted levers have also been employed to obtain this result. Some difficulty, however, has been experienced in obtaining a smooth and continuous good action of these devices as their pivotal parts and engaging surfaces wear upon each other, and hence forms of construction and simple arrangement and combination of parts have been devised to overcome these defects and increase the efficiency, practicability and positive action of the device.

The invention consists further in the forms of construction shown in the accompanying drawings, hereinafter described, and specifically pointed out in the claims.

In the accompanying drawings Figure 1 is a longitudinal central section of the device exemplified in connecting a divided automobile shaft; Fig. 2 is a transverse section there-

of; and Fig. 3 is a detail view of a modified form of toggle.

In these views 1 and 2 are the adjacent portions of the shaft, 1, being preferably the driving portion thereof, 3 is a clutch drum which may be formed in a fly wheel, or wheel for any other purpose if desired, and is secured by means of a key 4 to the shaft 2. One shaft as 2 is shown to enter a socket or recess in the end of the other shaft and find a bearing therein at 4, so that no further support is required at this point for either shaft. To the inner end of the shaft 1 is secured the split ring 5, the sides of which correspond in shape with the inner surface of the clutch drum 3, so that when expanded a frictional contact is obtained with practically all of the inner surface of the clutch drum, the extremities of the arms being slightly separated to enable the ring to collapse when it is desired to disengage them with the clutch surface of the drum. The arms are connected integrally with the central hub or shaft by means of the radial arm 6, intermediate between the ends of the expansible arms and so placed as not to interfere with the free action thereof.

Pivoted by means of suitable pins 7 to ears 8 upon the inner surfaces of the expansible arms are the links, L L, which are pivotally attached together at their inner ends by means of a common pin 9, to form a toggle joint. A shoe 10 is formed and beveled at the outer edge and connected with the links by a common pin 9, and against this shoe bears the inner end of the conical sleeve 11, provided with a clutch groove 12 adapted to receive a clutch fork or ring 12'. Or a roller R mounted in a double fork F may be made to directly bear upon the cone 11. A strong spiral spring 13 bears against the outer end of the clutch sleeve and against the collar or shoulder 14 upon the shaft.

In operation the spring 13 normally forces the conical sleeve underneath the shoe 10 or roller R and tends to close the toggle joint, forcing the central joint radially outwards so as to separate the sides of the expansible ring and force them into engagement with the drum. The spring will then maintain them in close frictional contact therewith until the conical sleeve is withdrawn. On account of this spring's action there is no perceptible jar.

I believe myself to be the first to engage a toggle joint without intermediate operating mechanism for the purpose of expanding the arms of a split ring, for the purpose
5 described and in connection with an automatically acting member to normally maintain the clutch portions in frictional contact.

By this means a positive, smoothly acting and durable device is obtained, having an
10 efficiency not obtainable by other methods of construction.

I claim—

1. In a clutch, the combination with a divided shaft, one shaft having a socket into
15 which the end of the adjacent shaft is inserted, of a clutch drum secured to one shaft, a split expansible ring and arm integral at a central point with the other shaft, and adapted when expanded to en-
20 gage with said clutch drum, toggle links pivotally connected together at their inner ends to form a central toggle joint, a shoe pivoted to the central toggle joint, a cone sleeve upon the shaft which bears the split
25 ring, and means for normally forcing said cone underneath said shoe to expand said ring, substantially as described.

2. In a clutch, the combination with a divided shaft, one shaft provided with a
30 bearing in the other shaft, of a clutch drum secured to the one shaft, an expansible ring having integral arms, and integral with the other shaft, links pivoted to said arms at their outer ends, and to each other at their
35 inner ends, a shoe pivoted to their inner ends, a longitudinally movable cone on the expansible ring shaft, a shoulder on said shaft,

and a coiled spring upon said shaft engaging said cone and shoulder, substantially as described.

3. In combination, two adjoining shafts,
40 one shaft provided with a reduced extremity, and the other with a socket into which said reduced extremity is inserted, a clutch drum on the reduced shaft, an expansible
45 ring and central arm therefor integral with the socket shaft, a collar thereon, toggle links pivoted upon said expansible ring and to each other, an engaging device pivoted
50 directly to the toggle joint, a cone sleeve on the socket shaft adapted to engage said engaging device, and a spring between said collar and said cone sleeve, substantially as described.

4. In a clutch adapted to a divided shaft,
55 one section of which is reduced and the other provided with a socket adapted to receive the said reduced portion, a clutch drum on one section, a radial web or arm integral with the extremity of the other section, an
60 expansible split ring integral with said web or arm, toggle links pivoted to the respective ring portions and to each other, an engaging device having arms pivoted to said toggle links, a common pivotal pin therefor, a
65 cone sleeve upon the split ring bearing shaft section and a spring therefor.

In testimony whereof I hereunto set my hand this 28th day of February 1908.

EARL H. SHERBONDY.

In presence of—

WM. M. MONROE,
GEO. S. COLE.