

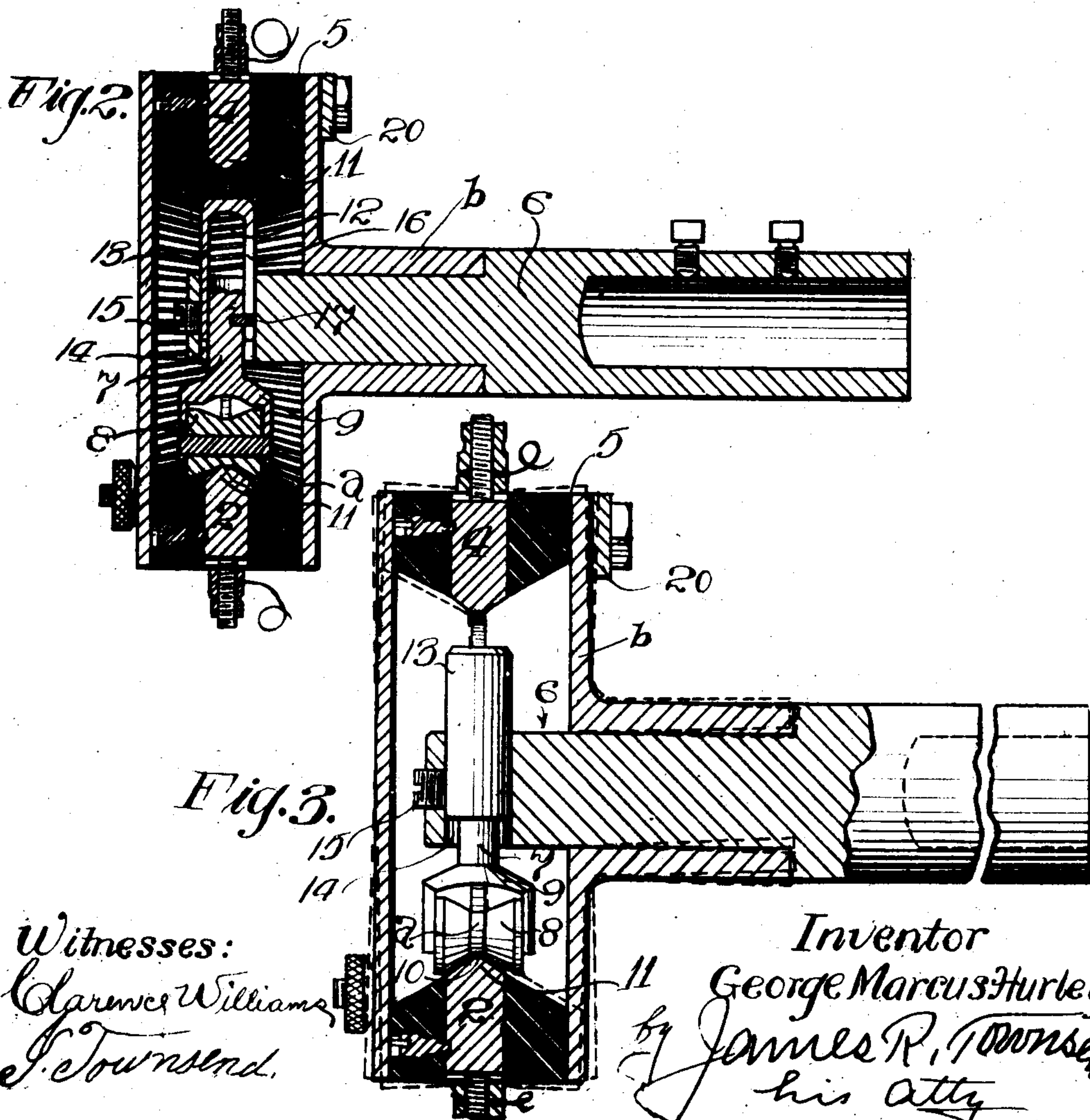
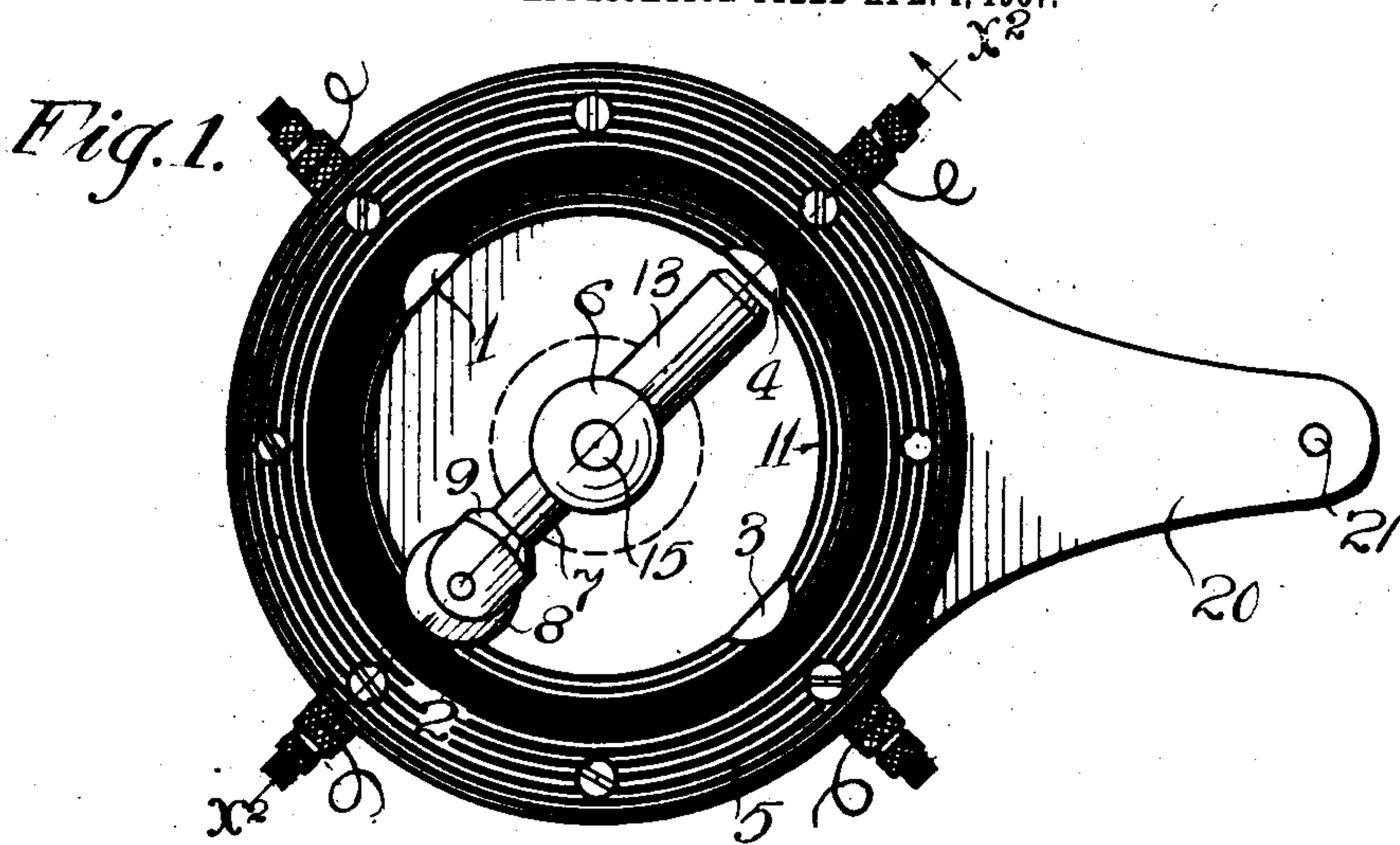
No. 871,064.

PATENTED NOV. 12, 1907.

G. M. HURLEY.

THREE POINT CONTACT TROLLEY TIMER FOR INTERNAL COMBUSTION MOTOR CARS.

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# UNITED STATES PATENT OFFICE.

GEORGE M. HURLEY, OF LOS ANGELES, CALIFORNIA.

## THREE-POINT CONTACT-TROLLEY TIMER FOR INTERNAL-COMBUSTION MOTOR-CARS.

No. 871,064.

Specification of Letters Patent.

Patented Nov. 12, 1907.

Application filed April 4, 1907. Serial No. 366,442.

To all whom it may concern:

Be it known that I, GEORGE MARCUS HURLEY, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Three-Point Contact-Trolley Timer for Internal-Combustion Motor-Cars, of which the following is a specification.

An object of this invention is to provide means for positively assuring the production of the electric spark for igniting the charges in the cylinders of internal combustion engines actually at the period desired.

A further object is to so construct the timer that it will operate to cause effective electrical contact invariably at the time required regardless of ordinary wear and tear, and also regardless of any looseness of parts which may occur through excessive or other wear on the insulating ring, bearing or base of the timer.

The accompanying drawings illustrate the invention.

Figure 1 is a view of my newly-invented timer detached, looking into the insulating-ring, the contact-trolley being shown in position to contact with one of the contact-points. The timer illustrated in this view is only adapted for a four-cylinder engine. Fig. 2 is a section on line  $x^2-x^2$ , Fig. 1. Fig. 3 is an enlarged detail illustrating different positions that may be assumed by the contact-trolley in case of worn parts; solid lines in this view show one position, and dotted lines indicate another.

1, 2, 3, 4 designate contact-points projecting slightly beyond the inner face of the insulating ring 5 of fiber or other suitable insulating material.

6 is the rotating arbor carrying a spring-pressed arm 7 which is provided at one end with a contact-trolley 8. The trolley is mounted in a yoke 9 provided on the end of the spring-pressed arm 7, and is in the nature of a V-shaped roller journaled in the yoke 9. The central portion,  $a$  of the trolley-roller is flat to correspond with the flat surface 10 of the projecting edge 11 of the lip formed on the interior of the insulating-ring 5. The spring 12 for normally holding the trolley in engagement with the lip of the insulating-ring 5 is housed in a shell or casing 13 which is fitted in the opening 14 provided in the end of the arbor and secured therein by a screw 15 extending through the arbor and impinging against the said shell. The shell is slotted, as seen at 16, for the purpose of accommodating the lug 17 provided on the end of the arm 7 and guides the said arm in the sleeve when the same is caused to be depressed against the tension of the spiral spring 12.

In practice, the base  $b$  for the insulating ring 5 will be made originally to fit the arbor 6, on which said base is revolubly mounted, as shown in Fig. 2, but in time the bearing of the base on said arbor will become worn to a greater or less extent, as indicated in Fig. 3. In such case a wobbling motion is set up at times in the base, as indicated by the dotted lines in said Fig. 3.

By reason of my improvement, such wobbling motion does not interfere with the sparking action, as the V-shaped trolley will positively engage some one of the three faces of the contact-points whenever the trolley passes such points.

20 designates the usual arm on the base for turning the same on the arbor to advance or retard the spark.

21 is an eye for the connecting-rod, not shown, for operation by the operator of the car.

It is to be understood that although I have shown a timer for a four-cylinder engine, the invention is applicable for use with 2, 4, 6, 8-cylinder, or other multiple engines; the change being simply in the number of contacts arranged around the insulating-ring.

What I claim is:—

1. An annular insulating-ring having an annular interiorly-projecting beveled lip provided at intervals with one or more contact points projecting slightly beyond the terminus of the lip, an arbor, a trolley mounted on said arbor and arranged to travel about said projecting lip at different times to engage the contact faces on said lip.

2. An arbor, a base revolubly mounted on said arbor, an insulating ring on said base having an interior annular bevel lip, whose edge is flat, said ring being provided with contact-points projecting beyond the face of said flat edge, an arm on said arbor, and a V-shaped roller carried by said arm and engaging the flat edge of the lip.

3. An arbor, a base revolubly mounted on said arbor, an insulating ring on said base having an interior annular bevel lip, whose edge is flat, said ring being provided with contact points projecting beyond the face of said flat edge, an arm on said arbor, a V-shaped trolley carried by said arbor and engaging the flat edge of the lip, and means for normally holding said trolley in engagement with said lip.

4. An arbor, a base revolubly mounted on said arbor, an insulating ring on said base having an interior bevel lip whose edge is flat, said lip being provided with contact points projecting beyond the face of said flat edge, an arm on said arbor, a trolley carried by said arbor and arranged to engage the said lip and travel around the flat face of the same, a spring for normally holding said trolley in engagement with said lip, and a casing for said spring, said casing being secured to said arbor.

5. An arbor, a base revolubly mounted on said arbor, an insulating ring on said base having an interior bevel lip whose edge is flat, said lip being provided with contact-points projecting beyond the face of said flat edge, an arm on said arbor terminating in a yoke, a trolley journaled in said yoke, and arranged to engage the flat face of said bevel, a spring for normally holding said trolley in engagement with said flat face, a casing for said spring, and means for securing said casing in said arbor.

6. An arbor, a base revolubly mounted on said arbor, an insulating ring on said base having an interior bevel lip whose edge is flat, said lip being provided with contact-points projecting beyond the face of said flat edge, a casing carried by said arbor, said casing having a slot, a spring in said casing, an arm provided with a lug carried by said arbor and arranged to fit said casing, said lug being arranged to slide in the slot of said casing, a trolley mounted on said arm and arranged to engage said flat edge of said lip, and means for removably securing said casing in said arbor.

7. A three-point contact trolley-timer for internal combustion motor-cars, comprising an arbor, an insulating-



- ring having a V-shaped lip, contacts having V-shaped ends, and a V-shaped trolley yieldingly mounted on said arbor to run on said V-shaped lip and adapted to contact at any of the three contact-points on said V-shaped contacts, substantially as and for the purpose set forth.
- 5 8. An arbor, a base revolubly mounted thereon, an insulating ring on said base having an interior annular beveled lip, contact points in the face of said lip, an arm on said arbor, and a V-shaped roller carried by said arm and engaging the edge of the lip.
- 10 9. An arbor, a base revolubly mounted on said arbor, an insulating ring on said base having an interior annular beveled lip and provided with contact points in the face of said lip, an arm on said arbor, a V-shaped trolley carried by said arbor and engaging the lip, and means for normally holding said trolley in engagement with said lip.
- 15 10. An arbor, a base revolubly mounted on said arbor, an insulating ring on said base having an interior beveled lip and provided with contact points in said lip, a trolley carried by said arbor and arranged to engage said lip and contact points, a spring for normally holding said trolley in engagement with said lip, and a casing for said spring secured to said arbor.
- 20 11. An arbor, a base revolubly mounted on said arbor, an insulating ring upon said base having an interior beveled lip provided with contact points, an arm on said arbor terminating in a yoke, a trolley carried by said yoke and arranged to engage said lip and contact points,
- a spring for normally holding said trolley in such engagement, a casing for said spring, and means for securing said casing in said arbor.
- 30 12. An arbor, a base revolubly mounted on said arbor, an insulating ring on said base having an interior beveled lip provided with contact points, a casing carried by said arbor and provided with a slot, a spring in said casing, an arm provided with a lug carried by said arbor and arranged to fit said casing and to slide in the slot thereof, a V-shaped trolley mounted in said arm and arranged to engage said lip and contact points, and means for movably securing said casing in said arbor.
- 35 13. A three point contact trolley timer for internal combustion motor cars, comprising an arbor, an insulating ring having a beveled lip, correspondingly beveled contacts in said lip, and a V-shaped trolley yieldingly mounted on said arbor to run on said beveled lip and adapted to contact at any of the contact points.
- 40 14. A trolley timer, comprising an insulating ring having an internal lip, contacts in said lip, and a V-shaped trolley yieldingly mounted to run on said lip and contact with said contacts at a plurality of points.
- 45 50 In testimony whereof, I have hereunto set my hand at Los Angeles California this 25th day of March 1907.
- GEORGE M. HURLEY.
- In presence of—  
JAMES R. TOWNSEND,  
M. BEULAH TOWNSEND.