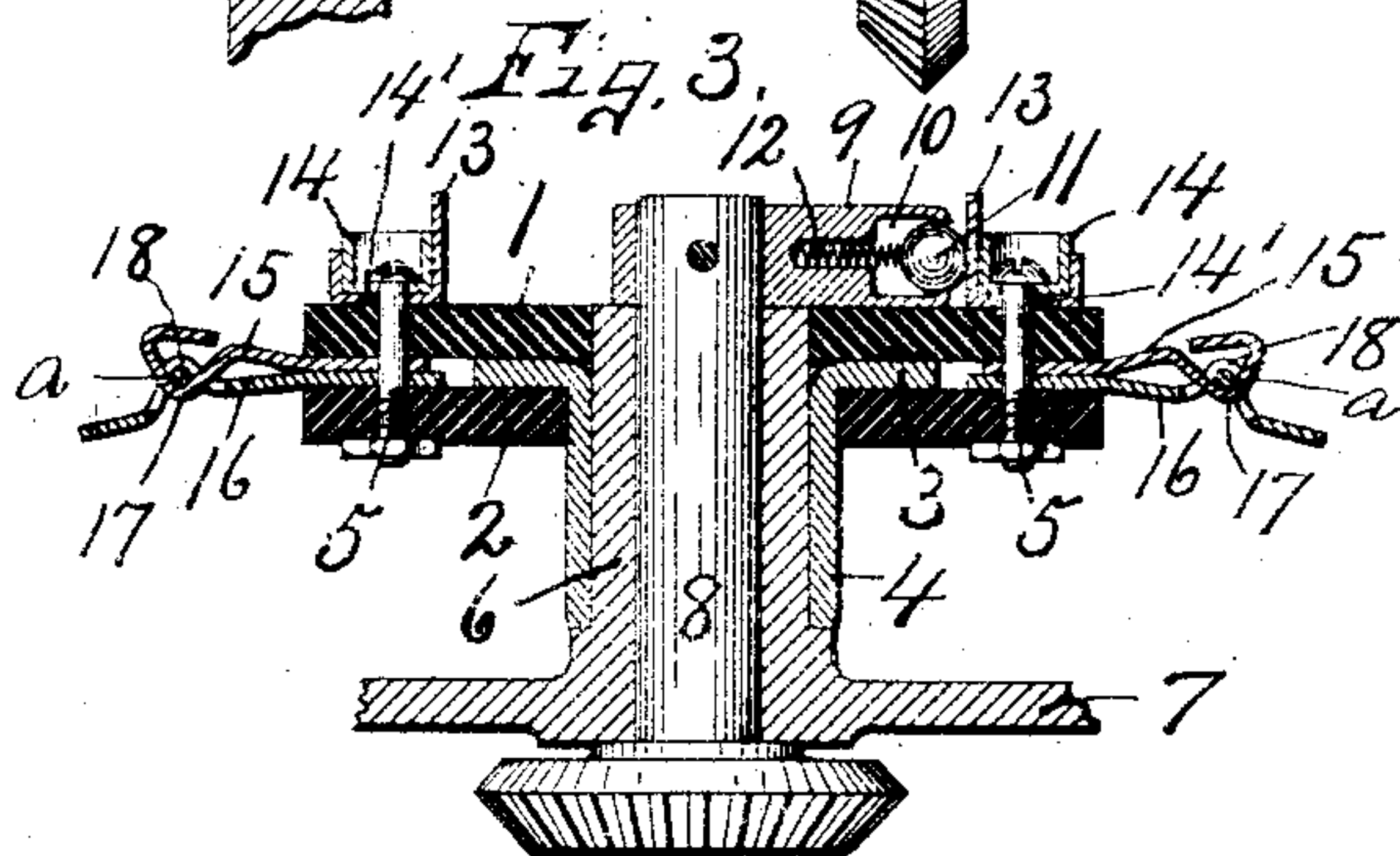
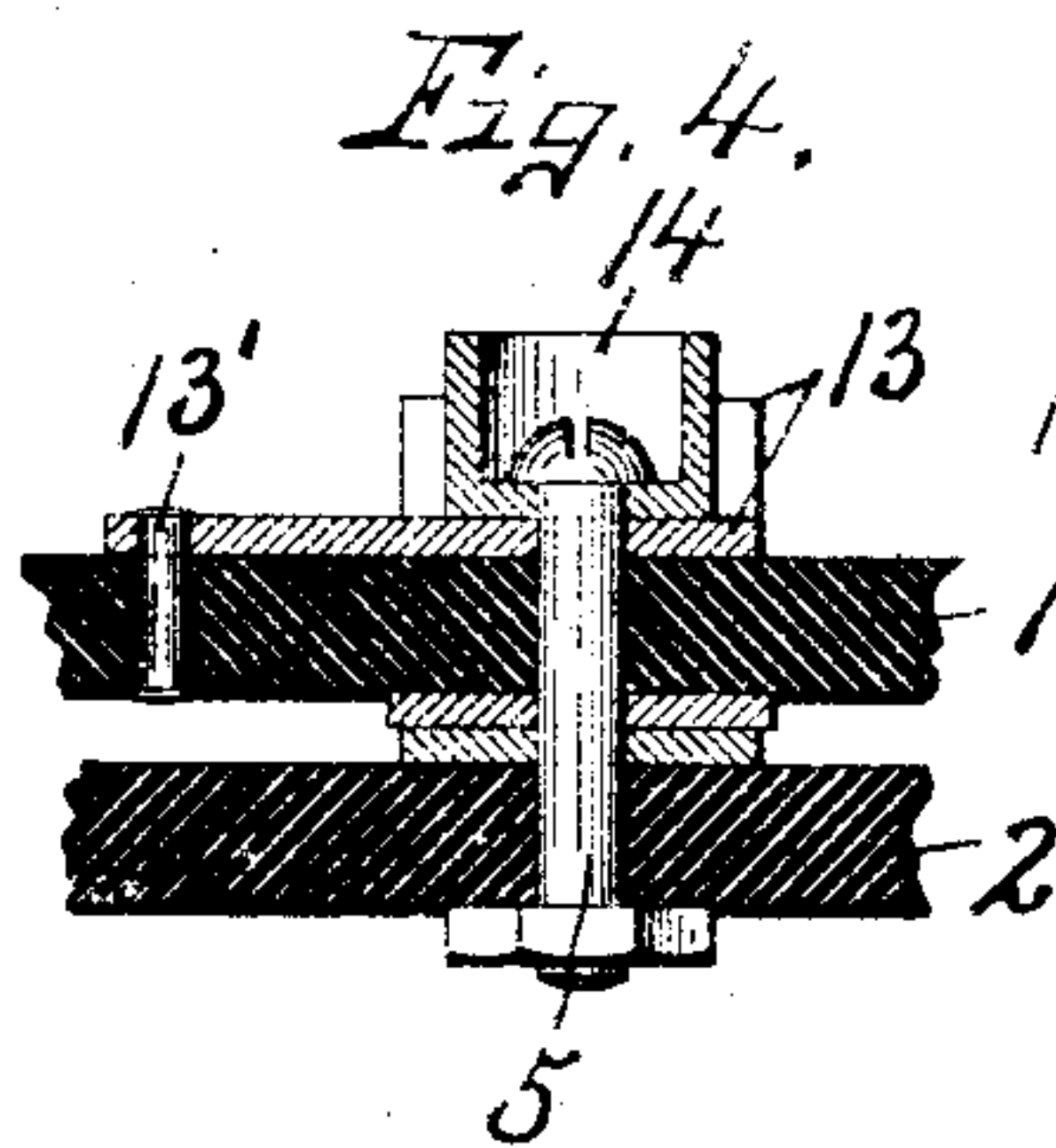
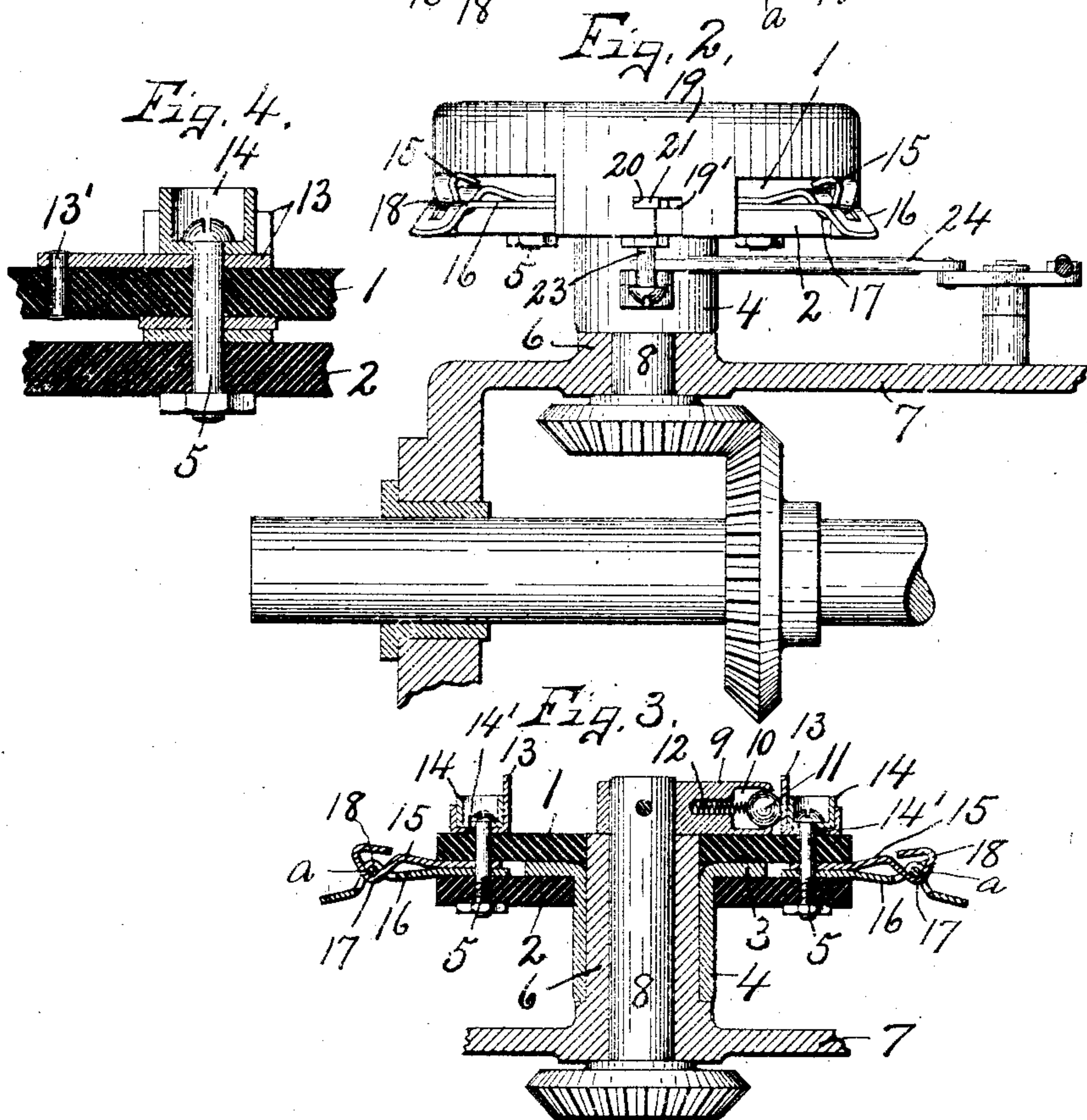
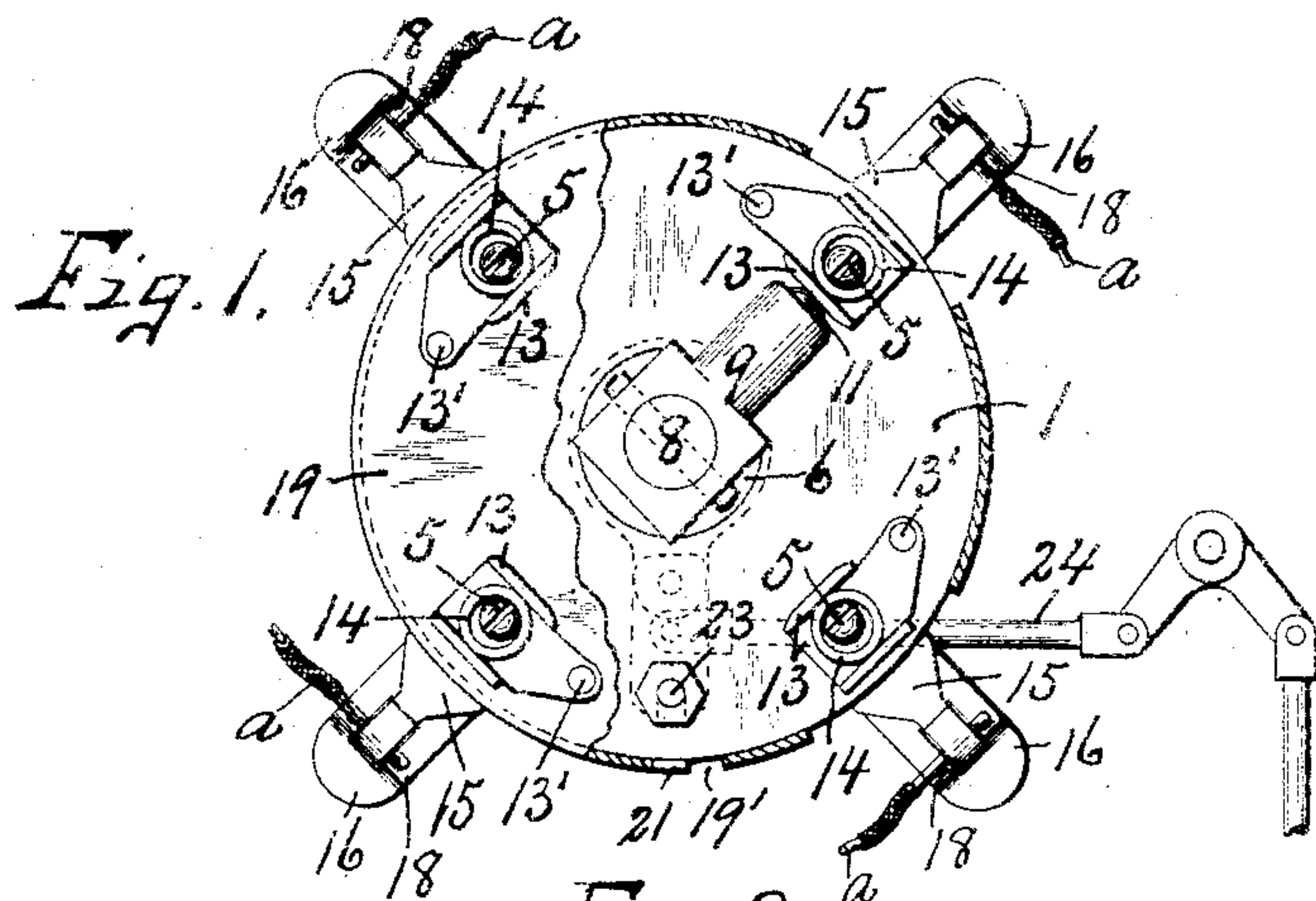


No. 865,972.

PATENTED SEPT. 10, 1907.

E. MOORE.
GAS ENGINE.

APPLICATION FILED MAY 14, 1906.



WITNESSES:

W. E. Chornick
W. E. Chornick

INVENTOR
Edward Moore

BY *Howard P. Levinson*
ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARD MOORE, OF SYRACUSE, NEW YORK.

GAS-ENGINE.

No. 865,972

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed May 14, 1906. Serial No. 316,745.

To all whom it may concern:

Be it known that I, EDWARD MOORE, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Gas-Engines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in electric spark timers for gas engines, and refers more particularly to the structure and manner of mounting what is commonly known as the "distributor head and revolving terminal".

My main object is to simplify the structure of this class of devices by reducing the number of parts to a minimum, and at the same time to increase its working efficiency and durability.

One of the specific objects is to frictionally clamp the distributor-head directly upon a non rotatable bearing so that it may be adjusted concentrically to change the lead or time of ignition during the compression stroke of the piston.

Another object is to provide the rotary terminal with a ball contact piece rotatably seated in the terminal arm to make and break contact with the several terminals of the distributor head so as to afford a minimum point of contact, and consequent quick break, and at the same time to extend the contact pieces of the distributor head axially a distance sufficient to allow a limited end-thrust of the revolving terminal without impairing the efficiency of the electrical contact.

A further object is to make the distributor head of separable disks or sections of insulating material, and to provide said head with spring wire-clamps which are secured in place between the disks by the same bolts which clamp the disks together upon the non-rotatable bearing.

Another object is to provide for the individual radial adjustment of the contact terminals.

Other objects and uses will be brought out in the following description.

In the drawings—Figures 1 and 2 are respectively a top plan and side elevation of an electric spark timing device embodying the various features of my invention, portions of the dust-cap being broken away in Fig. 1. Figs. 3 and 4 are enlarged sectional views.

In order to maintain the efficiency of devices of this character, it is necessary to keep the contact surfaces bright and perfect, and to reduce the contact area to a minimum so as to obtain a quick break without arcing between the contact surfaces. These devices are usually mounted upon a hub or sleeve which is journaled upon a fixed bracket, or other part of the engine to receive the shaft of the rapidly revolving contact terminal, which in this case will be termed, the brush.

In my present invention I have sought to mount the distributor head directly upon a non-rotatable support, thereby reducing the cost of manufacture, and still enabling the head to be shifted concentrically to change the lead.

In carrying out the objects stated, I provide a pair of similar disks —1— and —2— of insulating material, such as vulcanized fiber or rubber, which are frictionally clamped against opposite faces of an interposed flange —3— of a non-rotatable sleeve or bushing —4— by clamping bolts 5. The flanged bushing or sleeve —4— is rigidly secured to a hub or equivalent support —6— which may be a part of the engine frame or bracket, as —7—, said hub and bracket being formed with a central bearing or opening, in which is journaled a shaft —8— carrying a brush or contact terminal —9— in close proximity to the outer face of one of the disks, as —1—. This revolving arm or terminal —9— is rigidly secured to the revolving shaft —8— to rotate therewith, and is provided with a socket —10—, in which is loosely mounted a case-hardened metal ball contact piece —11— normally pressed outwardly or radially by a comparatively light coil-spring —12—, Fig. 3, said ball being retained against outward displacement by crimping the outer end of the socket —10— to a diameter slightly less than the diameter of the ball, thereby allowing a portion of the ball to protrude beyond the crimp. The ball —11— is forced to its outer limit, partially by centrifugal force, aided by the spring —12—, which is of smaller diameter and bears with light tension on a small area of the ball so as to allow said ball to roll freely in the socket, and thereby change the point of contact while traveling across the face of the terminals, as —13—, of the spark circuits, not shown, as the manner of electrically connecting these terminals to the spark plugs of a gas engine is well known to those skilled in the art.

In the present device I have shown a series of four contact terminals —13— secured equidistant apart concentrically around the axis of the terminal —9— within the radius of the contact surface of the ball —11—, each terminal consisting of a metal channel plate having a laterally extending arm pivoted at 13'— to permit radial adjustment of the terminal, such adjustment being effected through the medium of a rotary eccentric —14— fitting between the flanges of the terminal and pivoted upon a screw or bolt —5— passing through a laterally elongated slot —14'— in the base of the terminal, as best seen in Fig. 3, said bolt or screw —5— serving as one of the clamping bolts to frictionally clamp the disks —1— and —2— upon the flange —3—, and to hold the terminal and wire-binding clamp in operative position. Each of the terminals —13— is electrically connected by its fastening bolt —5— to a suitable binding post, or in this instance, a spring-wire-clamp com-

posed of opposite spring plates —15— and —16— having corresponding ends clamped between the outer edges of the disks —1— and —2— by one of the bolts —5—, the inner ends of said clamping plates —15— and —16— being formed with apertures for receiving the fastening bolt, while the outer ends are provided with loops —17— and 18— sliding by each other to receive between them the end of one of the wires, as —a—, of one of the sparking circuits. It now appears that each clamping-bolt —5— not only forms an electrical connection between the contact pieces —13— and binding clamps, but also serves to secure the contact pieces and binding clamps to the distributor head and to clamp the disks —1— and —2— of said head together in frictional engagement with said flange —3— of the sleeve —4— so that the distributor head proper, comprising the disks —1— and —2—; contact pieces —13— and binding clamps, may be shifted or adjusted concentrically upon the fixed flange —3— to change the lead or time of spark. The distributor head is provided with a metal dust-cap 19— which fits over and upon the peripheries of the disks —1— and —2— and is provided with an opensided slot —19'— having a portion thereof offset laterally at —20— to receive a locking member —21—, which is clamped between the disks —1— and —2— by a suitable bolt —23—. This bolt —23— forms a convenient means of attachment to a shifting device, as a link —24—, which may be connected in any desired manner with a manual device, not shown, but which is usually located within easy reaching distance of the operator so that he may readily shift the distributor head to change the position of the terminals of the contact pieces —13—, and thereby change the period of ignition of the explosive mixture in the gas engine with reference to the position of the piston on the compression stroke. The object of the radial adjustment of the contact terminals 13— is to take up wear and to insure a uniform contact between the ball —11— and each terminal.

The eccentric —14— is made in the form of a cup having its periphery bearing against both of the flanges of the channel terminal, and its base eccentrically pivoted to rotate upon the screw or bolt —5—, so that by loosening the bolt the eccentric 14— may be turned one way or the other to shift the terminal radially, the slot 14'— permitting such radial movement while the eccentric serves to positively lock the terminal against movement from its adjusted position, even though the bolt may be loose, it being understood that each of the bolts —5— is tightly fitted in its apertures in the disks —1— and —2—, and is always tightened after the terminals are properly adjusted.

Any suitable mechanism may be employed for synchronizing the movement of the rotary terminal —9— with that of the piston so as to make and break the spark circuits at the desired instant.

What I claim:

1. In an electric spark timer for gas engines, a pair of disks and a non-rotatable support clamped between the disks and upon which the said disks may be shifted con-

centrically, contact terminals on one of the disks and a rotary brush having a contact ball loose on one end and movable into contact with said terminals.

2. An electric spark timer for gas engines comprising a non-rotatable bearing, disks clamped to each other and frictionally clamped upon the bearing to permit the disks to be shifted concentric thereon, a contact terminal on one of the disks and a revolving brush making and breaking electrical contact with the terminal.

3. An electric spark terminal for gas engines comprising a pair of disks of insulating material, a non-rotatable support upon which said disks are mounted, a contact terminal on one of the disks, a rotary contact brush, wire binding clamps between the disks, means for securing the contact terminal and binding clamp to the disks and for frictionally clamping said disks upon the non-rotatable support, whereby the disks may be shifted concentrically to change the lead.

4. An electric spark timer for gas engines comprising a pair of disks of insulating material and a non-rotatable support therefor, means for clamping said disks to each other and frictionally clamping them upon the support to permit them to be moved concentrically, contact terminals mounted on one of the disks and a revolving brush making and breaking contact with said terminals.

5. In an electric spark timer for gas engines, a pair of disks of insulating material and a non-rotatable support therefor, a rotary contact brush, a terminal clamped between the disks and means for frictionally clamping said disks upon said support to permit them to be shifted concentrically thereon.

6. In an electric spark timer for gas engines, disks of insulating material, a non-rotatable support having an annular flange interposed between the disks, means for frictionally clamping the disks upon said flange to permit the disks to be shifted concentrically thereon, wire binding clamps held between the disks, a contact terminal mounted on one of the disks and electrically connected to the binding clamp and a rotary brush having a contact ball loosely mounted therein to make and break contact with the terminal.

7. In an electric spark timer for gas engines, a distributor head and a terminal thereon, and a rotary eccentric for adjusting said terminal.

8. In an electric spark timer, a pair of disks of insulating material, a non-rotatable supporting flange between the disks, means for frictionally clamping the disks upon said flange to permit the disks to be adjusted concentrically, a terminal on one of the disks, a rotary contact brush, and means for adjusting said terminal radially and wire clamps frictionally engaged by and held between the disks.

9. In an electric spark timer for gas engines, a distributor-head, a contact terminal mounted on the head and provided with opposite shoulders, a rotary eccentric engaging said shoulders to adjust the contact terminal radially, and a rotary brush to make and break contact with said terminal.

10. In an electric spark timer for gas engines, a pair of disks of insulating material, a non-rotatable supporting flange interposed between said disks, means for frictionally clamping the disks upon said flange, a rotary brush, a series of contact terminals mounted on one of the disks in the path of the brush, each of said terminals being provided with opposite shoulders, and a plurality of rotary eccentrics each fitted between the shoulders of one of the terminals to adjust its terminal radially and to lock it in its adjusted position.

In witness whereof I have hereunto set my hand this 5th day of May 1906.

EDWARD MOORE.

Witnesses:

MILDRED M. NOTT,
HOWARD P. DENISON.