

No. 862,041.

PATENTED JULY 30, 1907.

J. WILKINSON.
CIRCUIT MAKER AND BREAKER.
APPLICATION FILED APR. 15, 1907.

Fig-1-

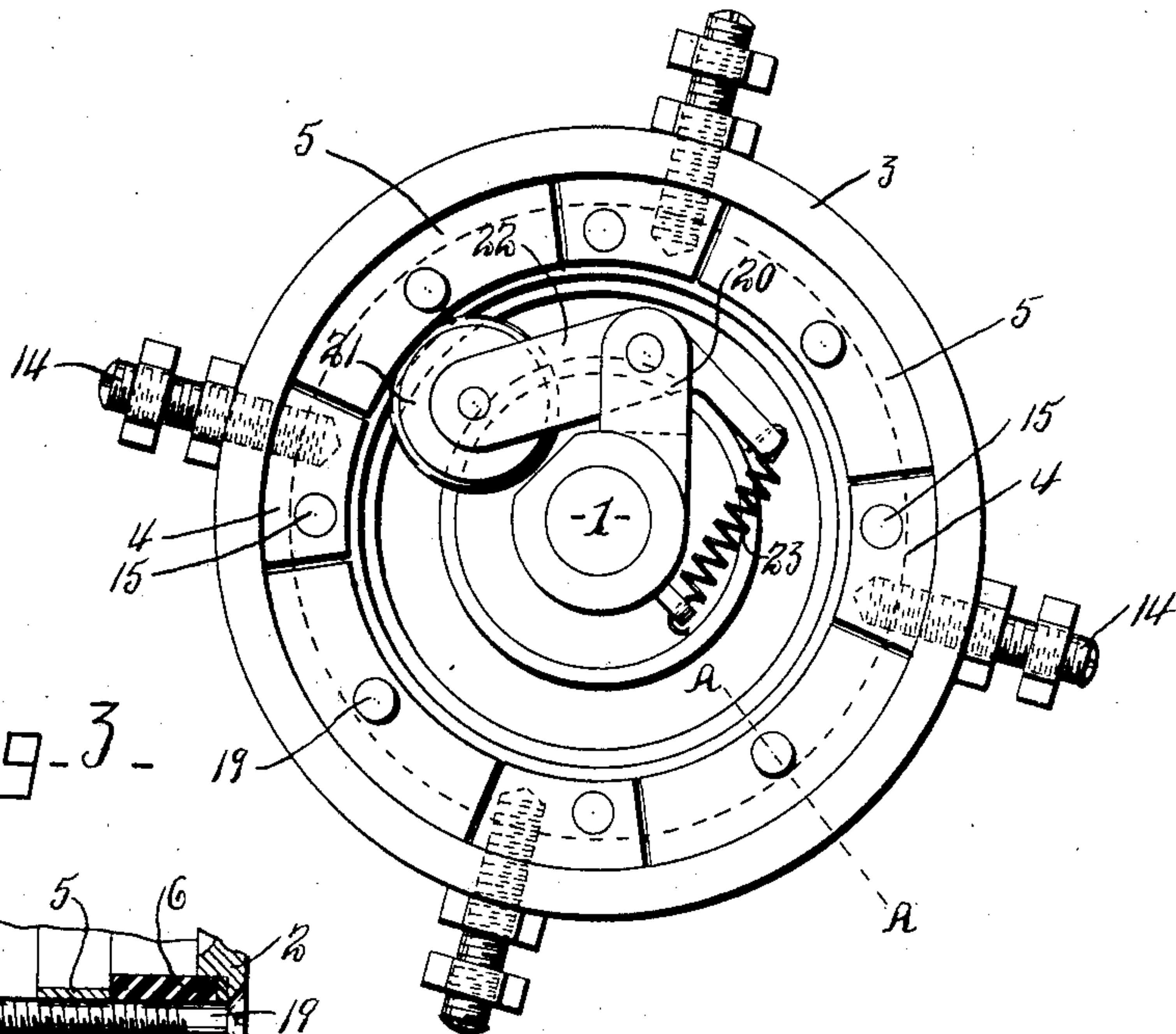


Fig-3-

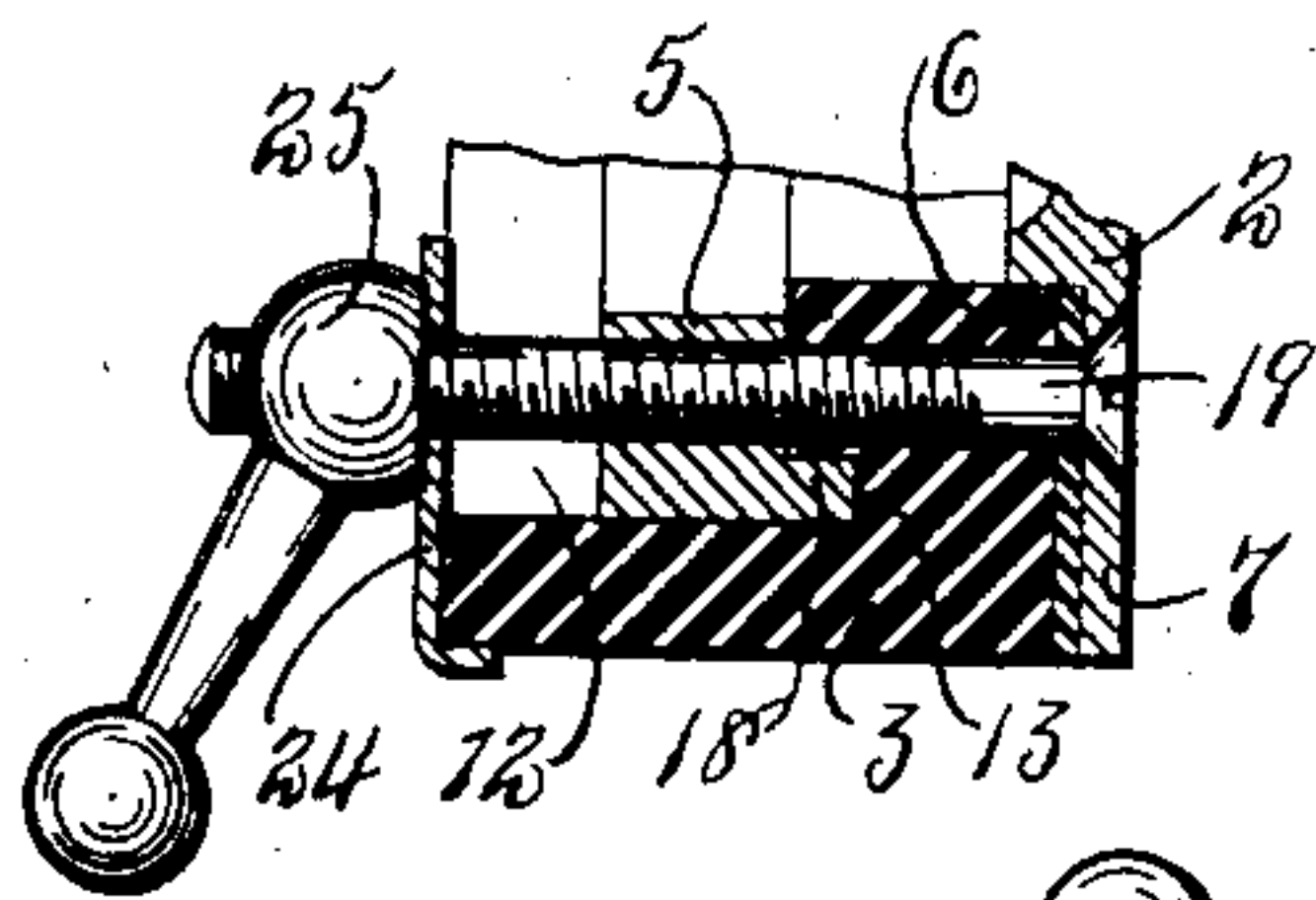
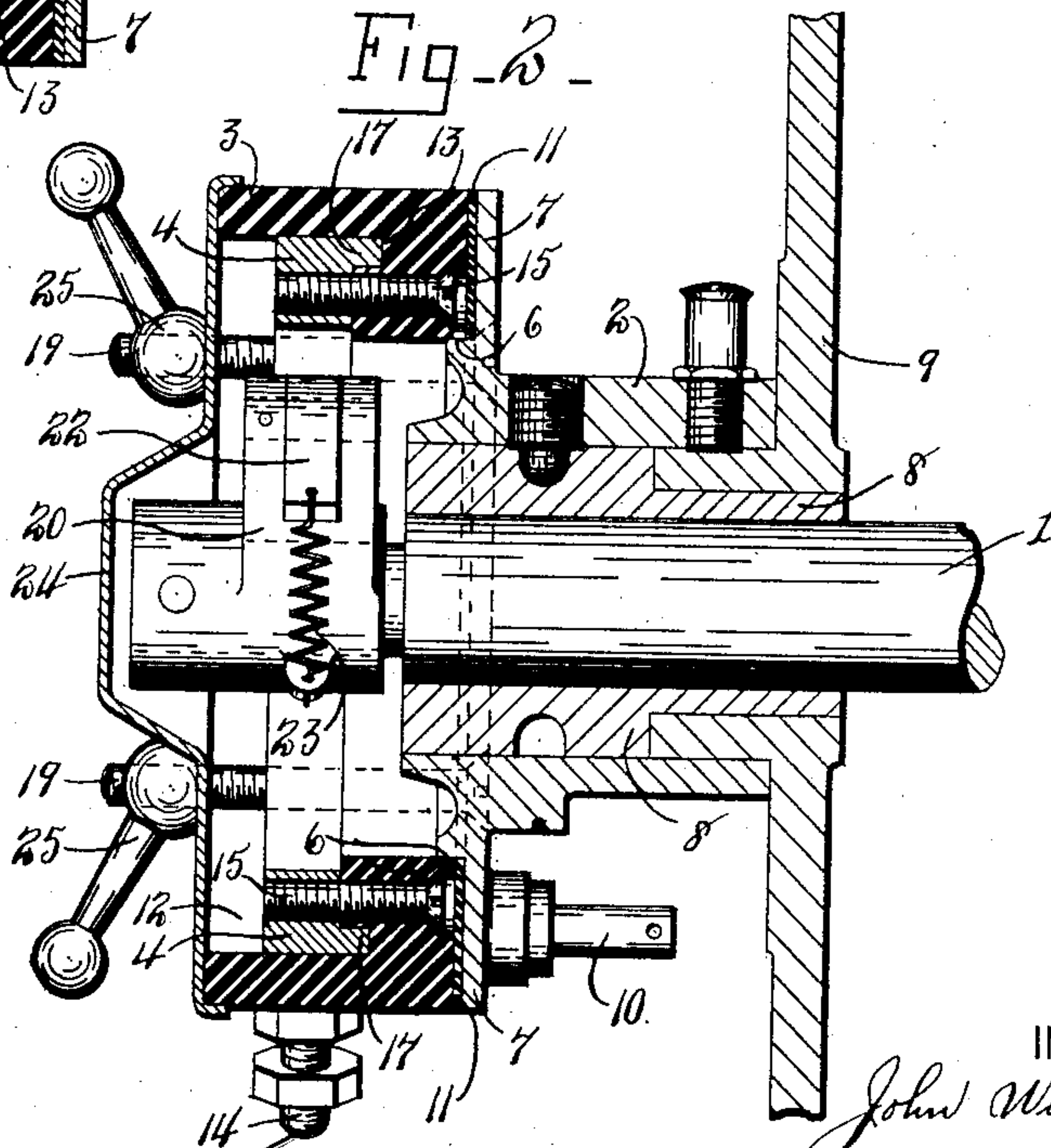


Fig-2-



WITNESSES:

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CIRCUIT MAKER AND BREAKER.

No. 862,041.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed April 15, 1907. Serial No. 368,167.

To all whom it may concern:

Be it known that I, JOHN WILKINSON, of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Circuit Maker and Breaker, of which the following is a specification.

My invention has for its object the production of a circuit maker and breaker applicable to internal-combustion engines, which is particularly simple in construction and highly efficient and durable in use; and to this end it consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawing in which like characters designate corresponding parts in all the views.

Figure 1 is a face view of this circuit maker and breaker, parts thereof being removed. Fig. 2 is a longitudinal sectional view, partly in elevation. Fig. 3 is a sectional view on line A—A, Fig. 1.

This circuit maker and breaker comprises fixed and rotatable elements, one having a substantially continuous hardened metallic path for coacting with the other. The fixed element is usually arranged concentric with the cam-shaft 1 of an internal-combustion engine, and comprises a support 2, a ring-shaped part 3, contact-pieces 4, and metallic bearing-members 5. As best seen in Fig. 2, the support 2 consists of a metal sleeve having one end provided with an annular bearing surface 6, and with a peripheral flange 7 projecting from the surface 6. The support 2 is suitably mounted upon a bushing 8 which forms a bearing for the cam-shaft 1 and is fixed to the frame 9 of the internal-combustion engine. Said support 2 is normally fixed from movement about the axis of the cam-shaft 1, but said support and the bushing 8 are suitably connected for permitting the support to move relatively to the bushing a limited distance when it is desired to delay the ignitions. The movement of the support 2 relatively to the bushing 8 may be effected by any desirable means, not illustrated, connected to an arm 10 projecting from the outer surface of the flange 7.

As is obvious, the connection between the support 2 and the bushing 8, and the means connected to said support for effecting movement thereof relatively to the bushing, form no part of my present invention, and hence further description thereof is deemed unnecessary.

The ring-shaped part 3 is composed of insulating material, and is arranged concentric with the shaft 1. One end of the ring-shaped part 3 preferably encircles, and fits, the annular surface 6 of the support 2, and is suitably secured to the flange 7, an insulating ring 11 being interposed between said ring-shaped part 3 and flange 7. The ring-shaped part 3 is formed with a recess 12 which opens through the inner face, and

the outer end, of said part 3, and has an annular lateral extension 13 formed by a groove in the end wall of the recess 12.

As best seen in Fig. 1, the contact-pieces 4 are detachably seated in a circular series on the inner face of the recess 12, are preferably equidistant from each other, and are provided with suitable binding-screws 14. Said contact-pieces are held in place by screws 15 arranged at one side of the insulating ring 11 and extending through the end wall of the recess 12 and the contact-pieces. As best seen in Fig. 2, the contact-pieces 4 are formed with ribs 17 which enter the lateral extension 13 of the recess 12 and facilitate the effective support of said contact-pieces.

The bearing-members 5 are detachably seated on the inner face of the recess 12 and substantially fill the spaces between the contact-pieces 4, the wearing faces of said members 5 and pieces 4 being disposed in substantially the same curved line, and each bearing-member being of a length slightly less than the distance between two of the contact-pieces, so that a small space intervenes between opposing surfaces of the contact-pieces and bearing-members. Said bearing-members 5 are provided with ribs 18 similar to the ribs 17 of the contact-pieces, and are held in place by screws 19 extending through the end wall of the recess 12 and the bearing-members, parallel to the screws 15, and also serving to secure the ring-shaped part 3 to the support 2, corresponding ends of these screws 19 projecting through the insulating ring 11 and the flange 7, and their other ends projecting beyond the outer faces of said bearing-members. In practice, I construct the contact-pieces and bearing-members by first forming a ring of hardened metal conforming to the recess 12, and its lateral extension 13, and then dividing this ring into segments.

The rotatable element of my circuit maker and breaker preferably comprises an arm 20 suitably mounted on the cam-shaft 1 and carrying a contact-piece 21, here shown as a roller journaled in one end of a lever 22 which is pivoted intermediate of its ends to the arm 20, and is connected to one extremity of a spring 23 having its other extremity secured to the hub of the arm 20. It will be understood, however, that the contact-piece of the rotatable element may be carried directly on the arm 20 instead of on a lever pivoted thereto.

This circuit maker and breaker is preferably provided with a cover 24 which is formed with openings for receiving the projecting ends of the screws 19, and is held in place by nuts, or other clamping members 25, mounted on said projecting ends.

To those skilled in the art it will be understood that the inner face of the rotatable element of my circuit maker and breaker is formed with a substantially continuous hardened metallic path consisting of the inner faces of the metallic contact-pieces and bearing-mem-

bers, and that since these contact-pieces and bearing-members are segments of the same ring, the wear upon all parts of such metallic path is substantially uniform, and the efficiency and durability of the circuit maker and breaker is materially enhanced.

What I claim is:—

1. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a ring-shaped part of insulating material, contact-pieces detachably seated in a circular series on an inner face of the ring-shaped part, and spaced apart, and metallic bearing-members detachably seated on said inner face between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous hardened metallic path, and the other element having means coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose described.
2. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a ring-shaped part of insulating material formed with a recess opening through its inner face, contact-pieces detachably arranged in a circular series in the recess, and spaced apart, and metallic bearing-members detachably arranged in the recess between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous hardened metallic path, and the other element having means coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose set forth.
3. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a ring-shaped part of insulating material formed with a recess opening through its inner face and having an annular lateral extension, contact-pieces detachably arranged in a circular series in the recess, and spaced apart, metallic bearing-members detachably arranged in the recess between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous metallic path, and ribs provided on the contact-pieces and bearing-members and projecting into the lateral extension of the recess, and the other element having means coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose specified.
4. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a ring-shaped part of insulating material formed with a recess opening through its inner face, contact-pieces detachably arranged in a circular series in the recess, and spaced apart, screws projecting from an end wall of the recess and coacting with the contact-pieces for securing said contact-pieces in position, and metallic bearing-members detachably arranged in the recess between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous metallic path, and the other element having means coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose described.
5. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a metallic support provided with an annular bearing surface and a peripheral flange, a ring-shaped part of insulating material having one end encircling the bearing surface, means for securing the ring-shaped part to said peripheral flange, contact-pieces detachably arranged in a circular series on an inner face of the ring-shaped part, and spaced apart, and metallic bearing-members detachably arranged on said inner face between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous metallic path, and the other element

having means coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose set forth.

6. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a metallic support provided with a peripheral flange, a ring-shaped part of insulating material formed with a recess opening through its inner face, an insulating ring between the peripheral flange and the ring-shaped part, means for securing the ring-shaped part to said peripheral flange, contact-pieces detachably arranged in a circular series in the recess, and spaced apart, screws arranged at one side of the insulating ring and passed through an end wall of the recess and coacting with the contact-pieces for securing said contact-pieces in position, and metallic bearing-members detachably arranged in the recess between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous metallic path, and the other element having means coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose specified.

7. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a ring-shaped part of insulating material formed with a recess opening through its inner face, contact-pieces detachably arranged in a circular series in the recess, and spaced apart, metallic bearing-members detachably arranged in the recess between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous metallic path, and screws projecting from an end wall of the recess and coacting with the bearing-members for securing said bearing-members in position, and the other element having means for coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose described.

8. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a ring-shaped part of insulating material formed with a recess opening through its inner face, contact-pieces detachably arranged in a circular series in the recess, and spaced apart, metallic bearing-members detachably arranged in the recess between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous metallic path, screws projecting from an end wall of the recess and coacting with the bearing-members for securing said bearing-members in position, said screws projecting beyond the bearing-members, and a cover detachably mounted on the projecting ends of the screws, and the other element having means coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose described.

9. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a metallic support provided with a peripheral flange, a ring-shaped part of insulating material formed with a recess opening through its inner face, contact-pieces detachably arranged in a circular series in the recess, and spaced apart, and metallic bearing-members detachably arranged in the recess between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous metallic path, and screws projecting from the peripheral flange and through an end wall of the recess and coacting with the bearing-members for securing the ring-shaped part to said peripheral flange, and for securing said bearing-members in position, and the other element having means coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose set forth.

10. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a metallic support provided with an annular bearing surface and a peripheral flange, a ring-shaped part of insulating material having

one end encircling the bearing surface, said part being formed with a recess opening through its inner face, an insulating ring between the peripheral flange and the ring-shaped part, contact-pieces detachably arranged in a circular series in the recess, and spaced apart, screws arranged at one side of the insulating ring and passed through an end wall of the recess and coacting with the contact-pieces for securing said contact-pieces in position, metallic bearing-members detachably arranged in the recess between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous metallic path, screws projecting from the peripheral flange through the insulating ring and an end wall of the recess and coacting with the bearing-members for securing the ring-shaped part to said peripheral flange, and for securing said bearing-members in position, and the other element having means coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose described.

11. In a circuit maker and breaker, fixed and rotatable elements, one element comprising a metallic support provided with an annular bearing surface and a peripheral flange, a ring-shaped part of insulating material having one end encircling the bearing surface, said part being formed with a recess opening through its inner face, an insulating ring between the peripheral flange and the ring-

shaped part, contact-pieces detachably arranged in a circular series in the recess, and spaced apart, screws arranged at one side of the insulating ring and passed through an end wall of the recess and coacting with the contact-pieces for securing said contact-pieces in position, metallic bearing-members detachably arranged in the recess between the contact-pieces and substantially filling the spaces between said contact-pieces, the wearing faces of the contact-pieces and bearing-members being disposed in substantially the same curved line and forming a substantially continuous metallic path, screws projecting from the peripheral flange through the insulating ring and an end wall of the recess and coacting with the bearing members for securing the ring-shaped part to said peripheral flange, and for securing said bearing-members in position, said screws projecting beyond the bearing-members, and a cover detachably mounted on the projecting ends of the last-mentioned screws, and the other element having means coacting with the wearing faces of said contact-pieces and bearing-members, substantially as and for the purpose specified.

In testimony whereof, I have hereunto signed my name in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 13th day of April, 1907.

JOHN WILKINSON.

Witnesses:

S. DAVIS,
R. ARONSON.