

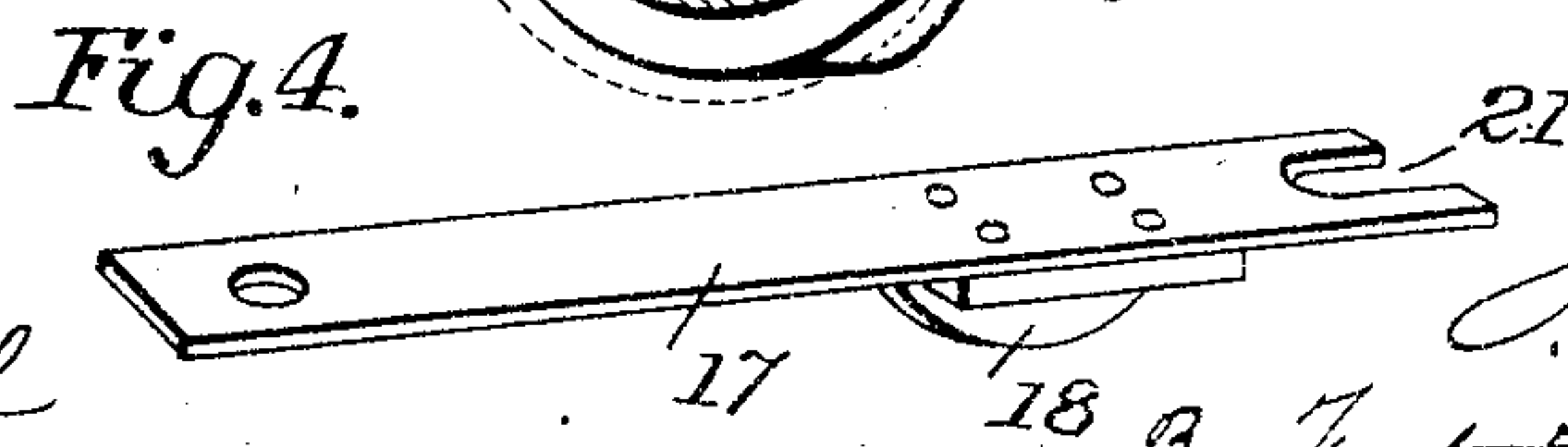
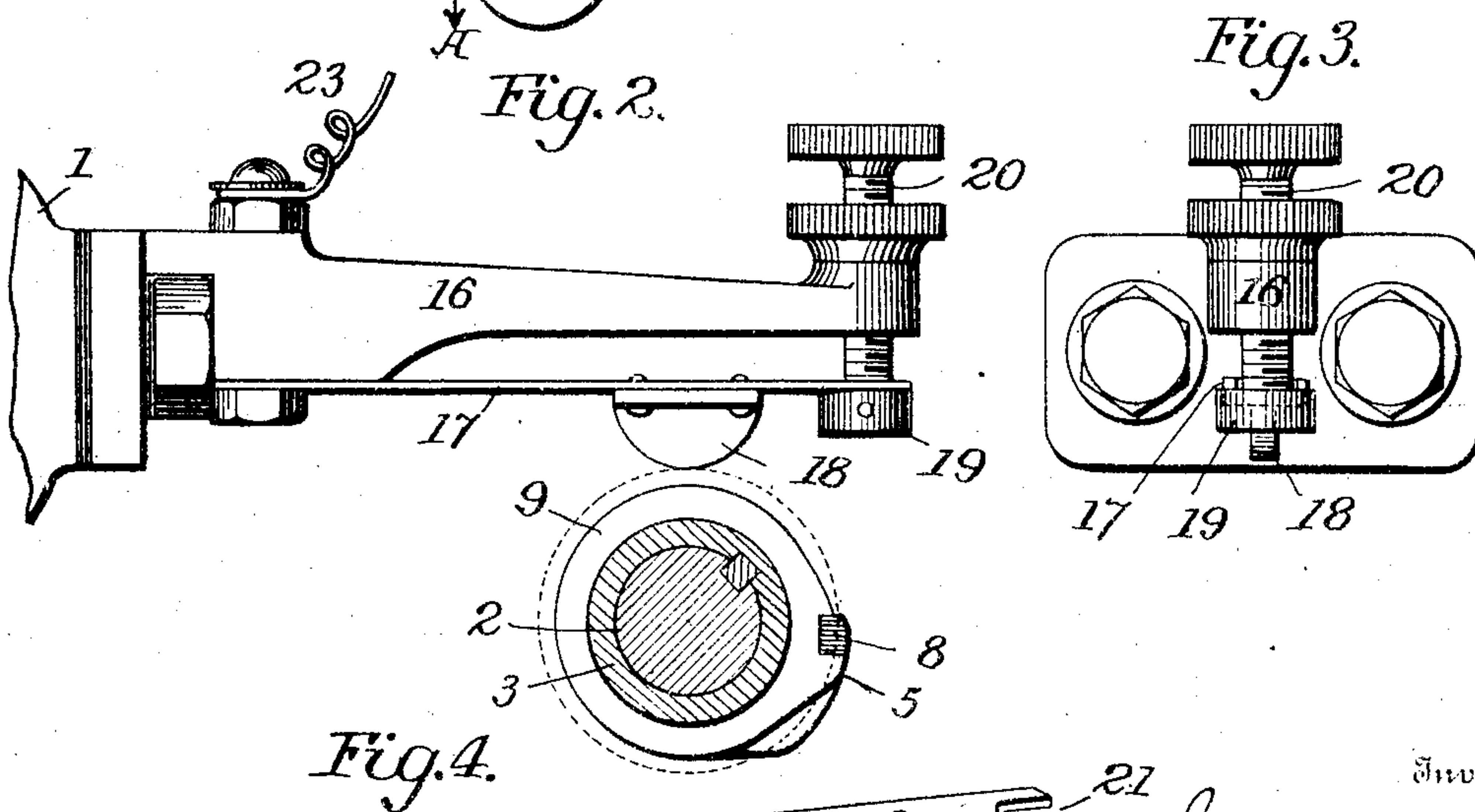
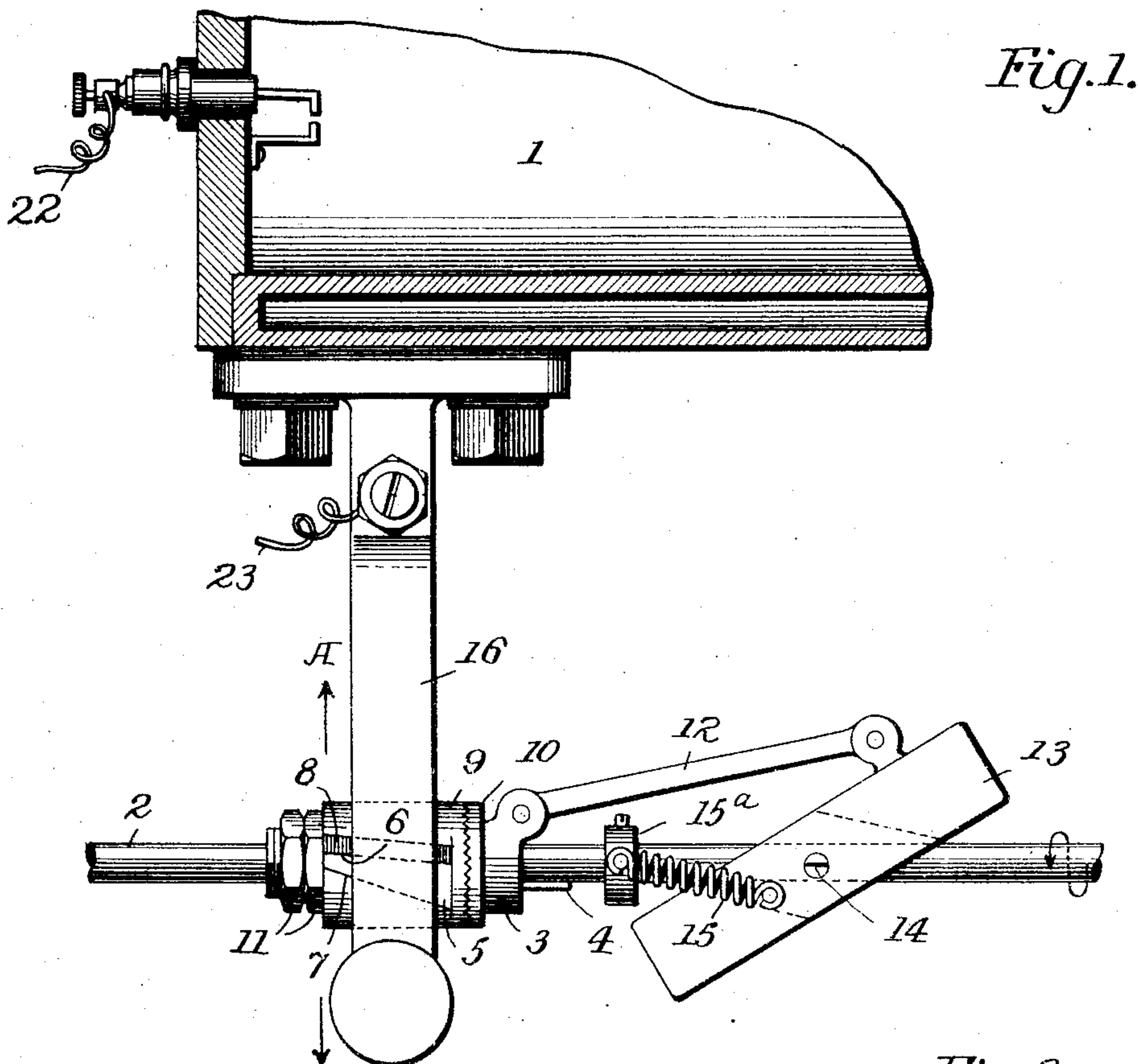
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PATENTED APR. 11, 1905.

J. W. PACKARD.

SPARKING IGNITING DEVICE FOR HYDROCARBON ENGINES.

APPLICATION FILED JUNE 27, 1903.



Witnesses

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UNITED STATES PATENT OFFICE.

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SPARKING IGNITING DEVICE FOR HYDROCARBON-ENGINES.

SPECIFICATION forming part of Letters Patent No. 787,212, dated April 11, 1905.

Application filed June 27, 1903. Serial No. 163,352.

To all whom it may concern:

Be it known that I, JAMES W. PACKARD, a citizen of the United States, residing at Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Sparking Igniting Devices for Hydrocarbon-Engines, of which the following is a specification.

This invention comprises improvements in the igniting device for hydrocarbon-engines patented to me in Letters Patent No. 667,792, issued February 12, 1901.

The object of the present invention is to improve the electric contacts, so as to insure certainty of operation, it having been found that in the patented device the contacts occasionally became dirty and for that reason inoperative or inefficient.

In the present invention one of the contact-points is adjustable and at the same time spring-pressed against the other, and the contact is a sliding instead of an impinging one, thereby insuring clean contact-surfaces.

Referring to the accompanying drawings, Figure 1 is a sectional view of part of a cylinder with the contact device shown in plan. Fig. 2 is a section on the line A A, Fig. 1. Fig. 3 is an end view of the bracket carrying the contact-spring, and Fig. 4 is a detail of said spring.

Referring to the drawings, 1 indicates the cylinder of a hydrocarbon-engine, and 2 a shaft arranged parallel with the cylinder, said shaft being connected with the crank-shaft of the engine in some suitable manner, so as to rotate in fixed relation therewith. Upon the shaft 2 is a sleeve 3, which is free to slide longitudinally on the shaft, but compelled to turn therewith by means of a spline 4 or other equivalent device. The sleeve 3 has on it a contact-cam 5, the operative face of which is tapered, said cam having a rear edge 6, which is approximately parallel with the shaft, and an inclined forward edge 7 for a purpose to be presently explained. In the rear of the edge 6 and flush with the highest surface of the cam is a block of insulating material 8. The cam 5 and the insulating material are pref-

erably carried on a cylindrical shell 9, which is adjustably mounted on the sleeve 3. As shown, the sleeve has a head 10, which is serrated on its inner surface, and the cam-cylinder 9 is clamped against said serrated head by nuts 11. By loosening the nuts 11 the cam may be set forward or rearward with respect to the shaft.

The sleeve 3 is connected by a link 12 to a suitable governor 13, pivoted at 14 to the shaft and operated in one direction by centrifugal force and in the other direction by a spring 15.

Connected to the cylinder or other suitable support is a bracket 16, said bracket being insulated from its support. Connected to the under surface of the bracket is a spring contact-plate 17, carrying a contact-piece 18. The spring 17 is under tension to move toward the shaft 2, and its outer end bears on a head 19 of an adjusting-screw 20. As shown, the end of the spring has a notch 21, through which the screw passes. By raising and lowering the screw the contact 18 may be adjusted to and from the cam. The spring is always free to move upward under the influence of the cam. The contact-point 18 may therefore be readily adjusted to take up wear and also to give it the desired pressure on the cam. The cylinder and the shaft 2 are electrically connected through the machinery or frame and the return-circuit passes from the terminal 22 on the cylinder through the usual spark-coil and battery to a terminal 23, connected with the spring 17.

It will be evident that the spark is advanced with respect to the position of the piston within the cylinder as the speed increases, due to the inclined forward edge 7 of the cam. It will also be evident that the extent of contact-surface increases as the speed increases, due to the tapered formation of the cam 5. This tapered surface of the cam is preferably so proportioned that the actual time of contact will be substantially uniform regardless of the speed, thus producing a uniform spark at different speeds. The circuit is broken as the contact passes from the cam-surface 5 to the

insulating-surface 8. When the contact-point 18 is properly adjusted, it touches only the tapered surface of cam 5 during the rotation of the shaft. The proper adjustment of the contact-point is shown in Fig. 2 and its path relative to the cam is shown by dotted circle in said figure. When the motor exceeds the desired limit of speed, the cam 5 passes beyond the contact-point 18 and thereafter there is no ignition, and consequently no additional power supplied, until the speed falls to said limit. By adjusting the collar 15^a upon the shaft 2 the speed at which ignition will cease may be varied.

The operation of the foregoing invention will be evident from the illustration and description. As in my previous patent, the duration of the spark will be substantially constant at different speeds, due to the tapered formation of the cam 5, and the spark will be advanced as the speed increases, due to the inclined forward edge 7 of the cam, which will close the circuit earlier at high speeds than at low speeds. It will be evident that the invention may be embodied in different forms of apparatus, and for that reason the present invention is not limited to the precise construction and arrangement of parts illustrated.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An igniting device for hydrocarbon-engines, comprising in combination, a sparking circuit, a rotating shaft, a contact-cam adapted to rotate with and slide on said shaft, said cam being adjustable about the shaft, means

for securing the cam to the shaft in any desired position to advance or delay the spark, and a governor controlling the sliding movement of said cam.

2. An igniting device for hydrocarbon-engines, comprising in combination, a sparking circuit, a rotating shaft, a part arranged to slide on and turn with said shaft, a governor controlling the sliding movement of said part, a sleeve on said part having a contact-cam, means for adjusting the sleeve relatively to the shaft to advance or delay the spark, and a contact-point arranged in the path of said cam.

3. An igniting device for hydrocarbon-engines comprising in combination, a sparking circuit, a rotating shaft, a tapered contact-surface arranged to rotate with and slide on said shaft, a governor controlling the sliding movement of said surface, a spring supporting a contact-point, and means for adjusting said spring and contact-point to and from the shaft.

4. An igniting device for hydrocarbon-engines comprising in combination, a sparking circuit, a rotating cam having a tapering contact-surface, a strip of insulating material in the rear of said cam, and a spring-supported contact-point in the path of said cam.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES W. PACKARD.

Witnesses:

S. D. WALDEN,
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