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PATENTED MAR. 27, 1906.

N. FOERSTER, D. J. CAREY & W. A. FOSTER.
SHUTTLE.

APPLICATION FILED DEC. 11, 1903. RENEWED AUG. 29, 1905.

2 SHEETS—SHEET 1.

FIG. 1.

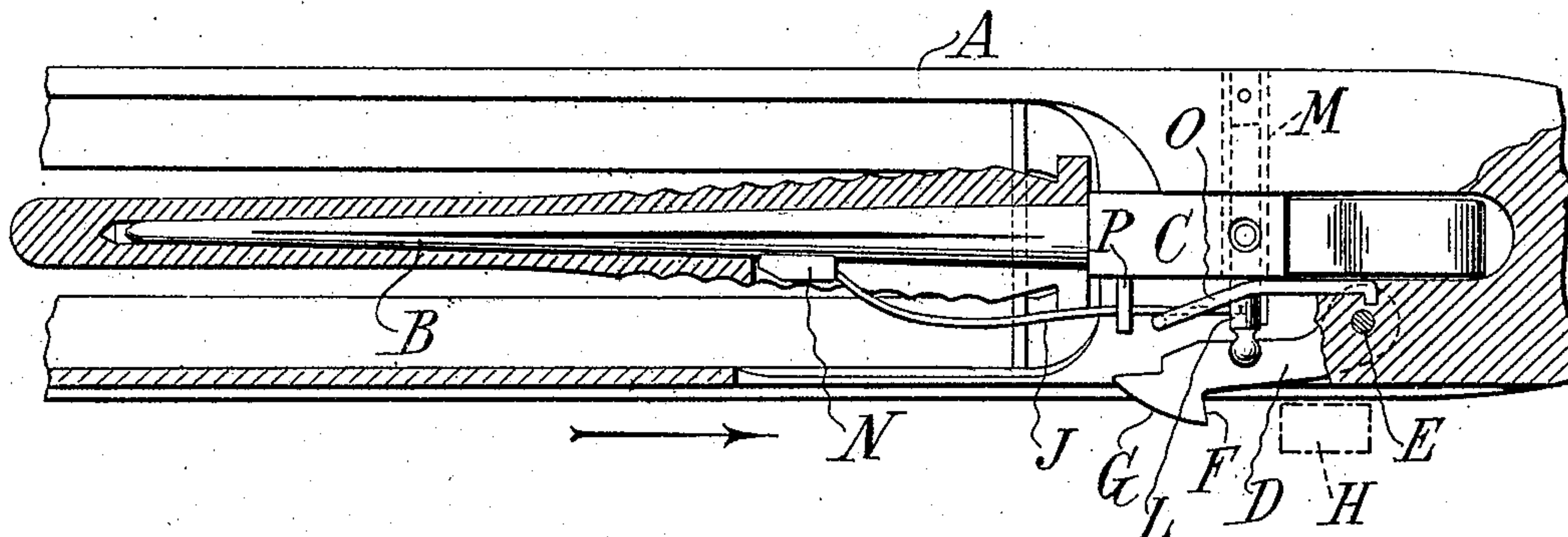


FIG. 2.

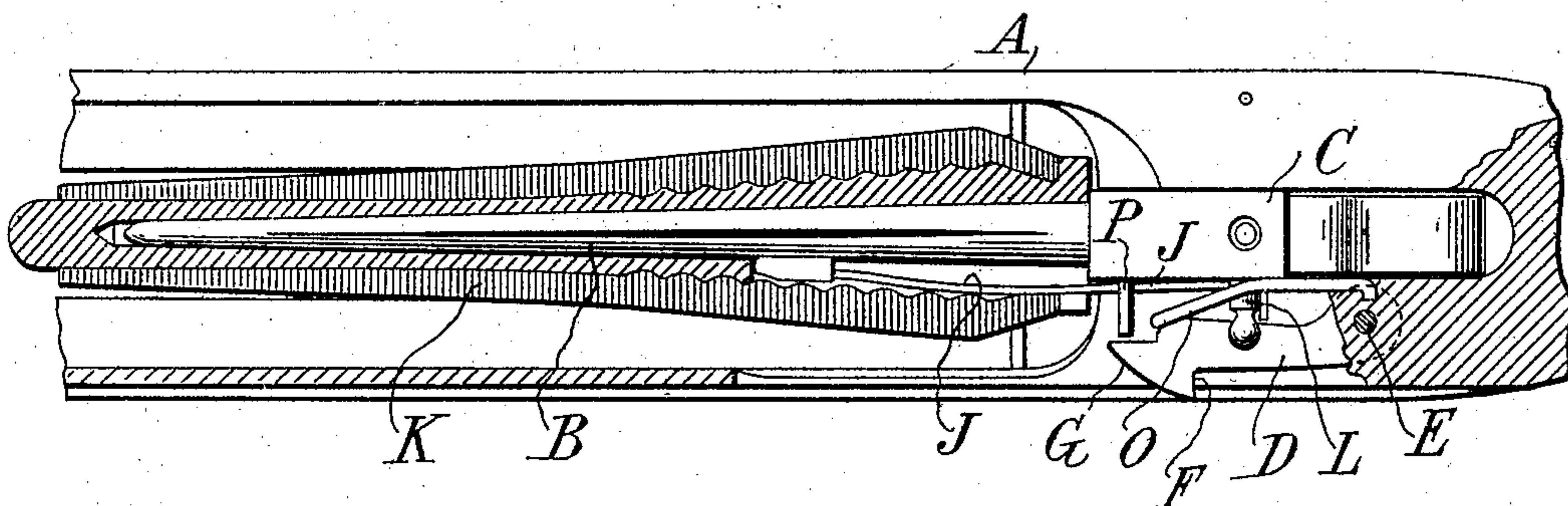


FIG. 3.

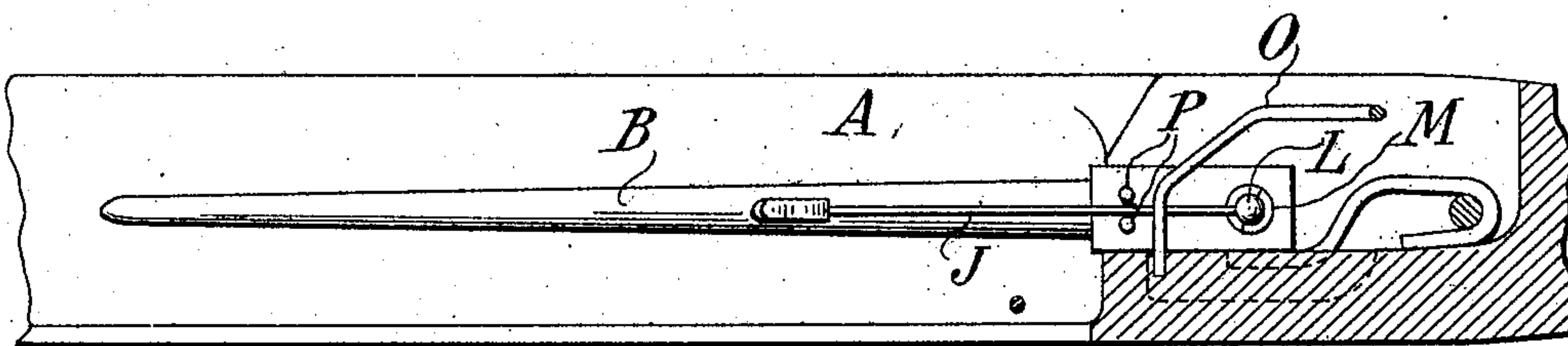
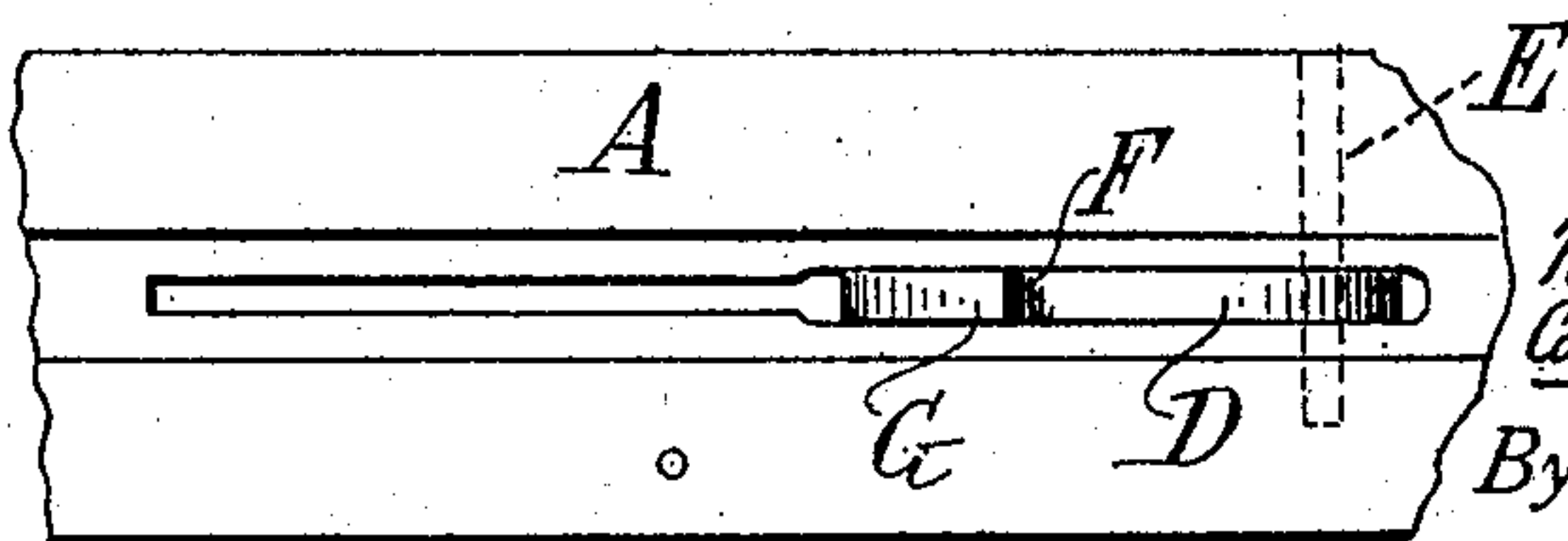


FIG. 4.



WITNESSES:

Irrel White
Rene Bruine

INVENTORS:

Norbert Foerster, Daniel J. Carey & William A. Foster,

By Attorneys,

Arthur C. Oraper, Co.

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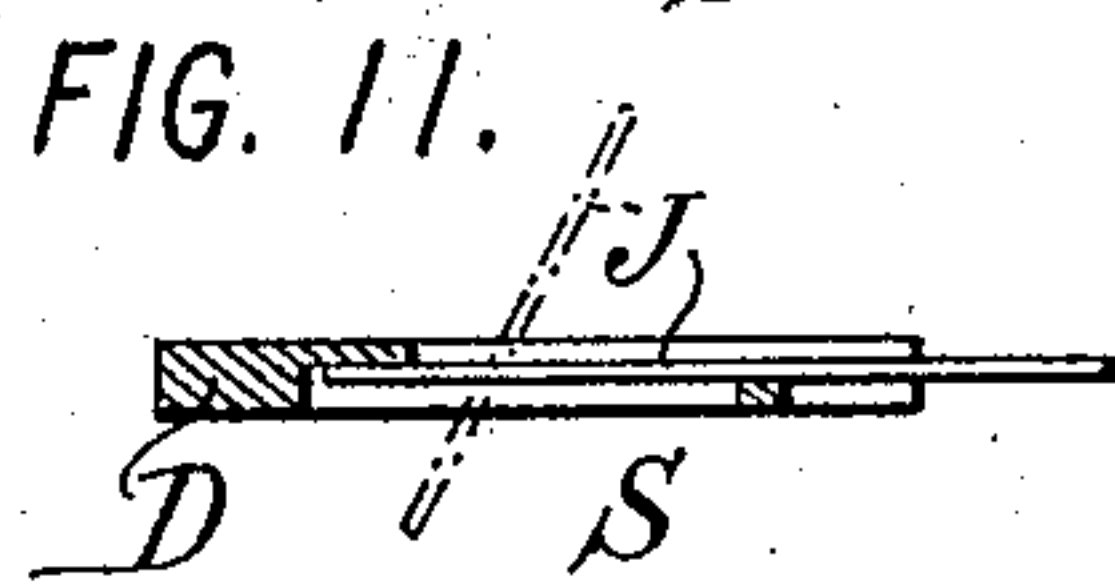
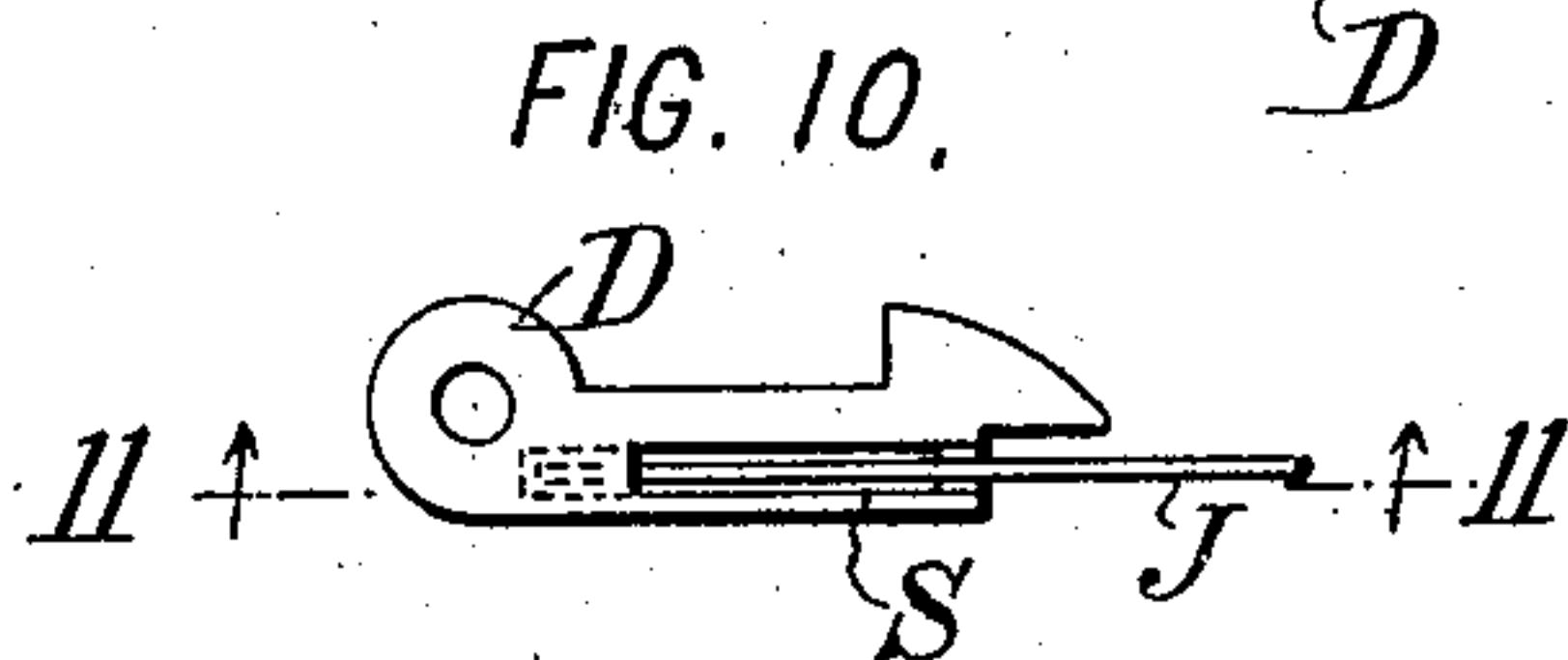
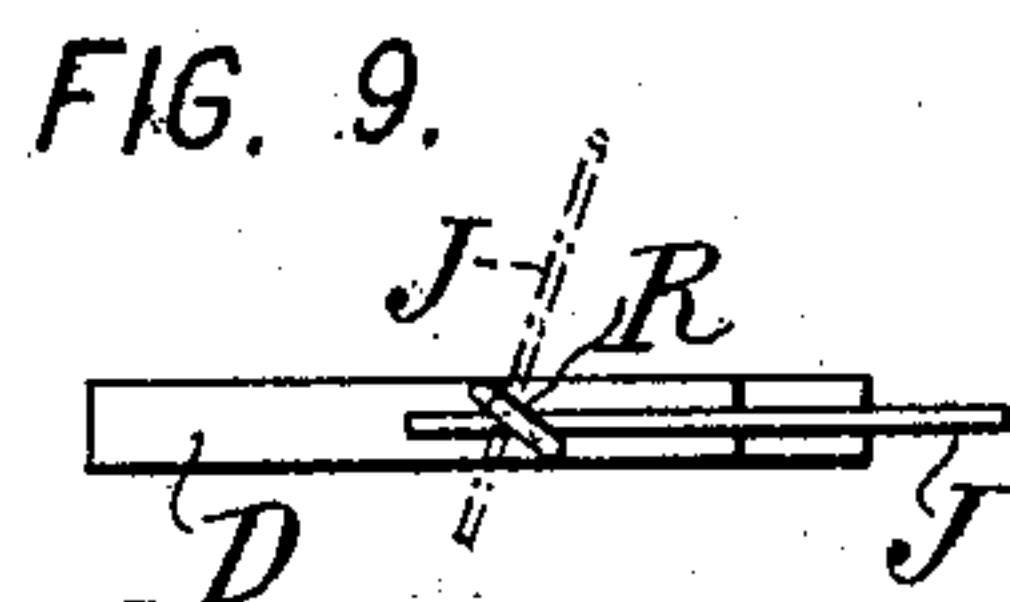
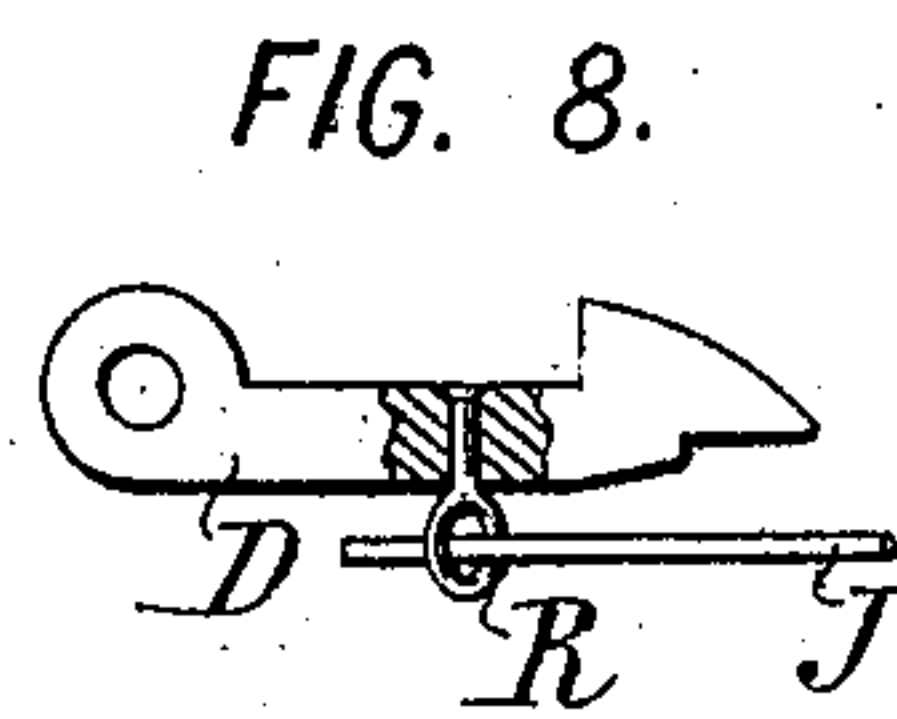
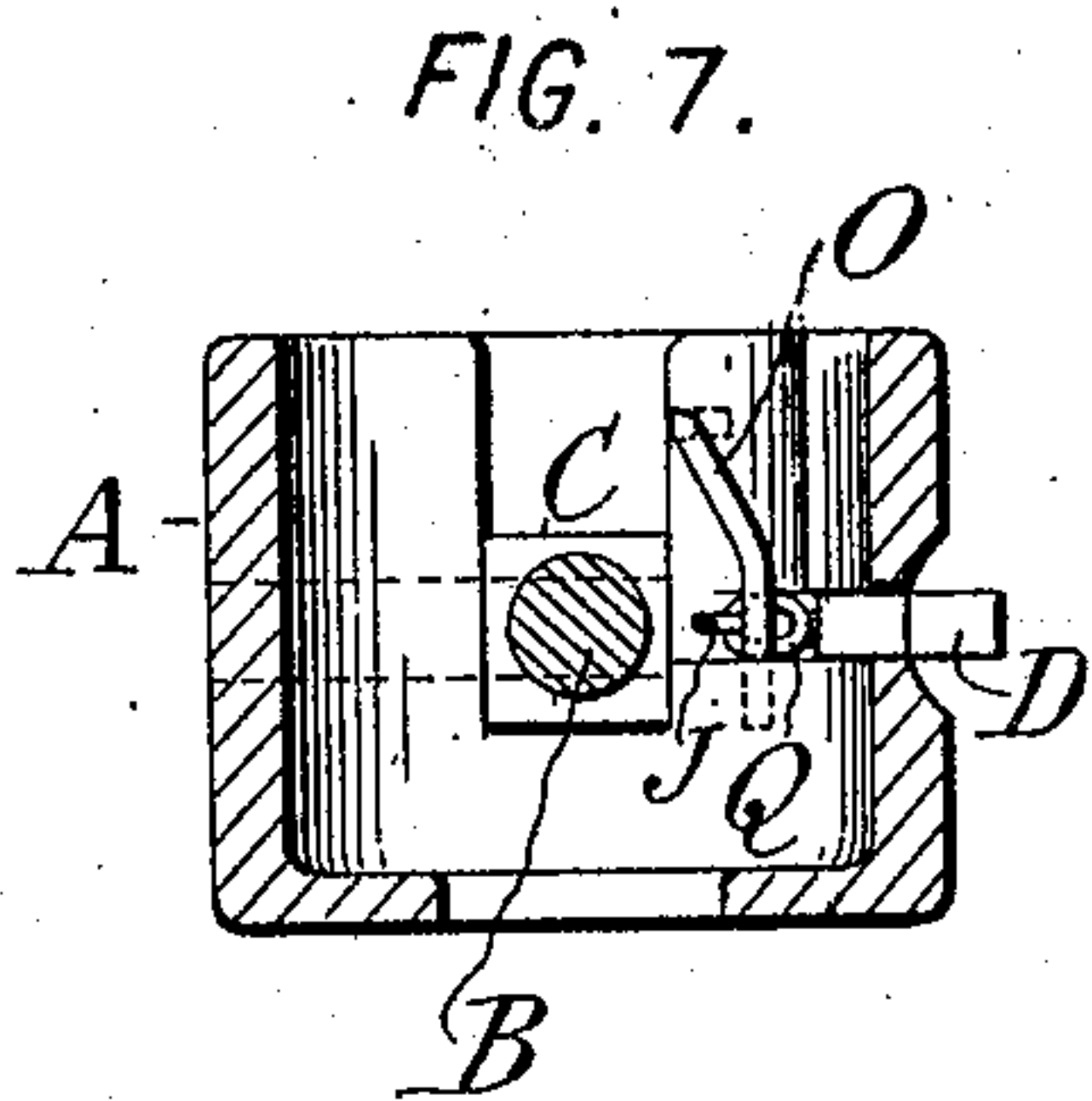
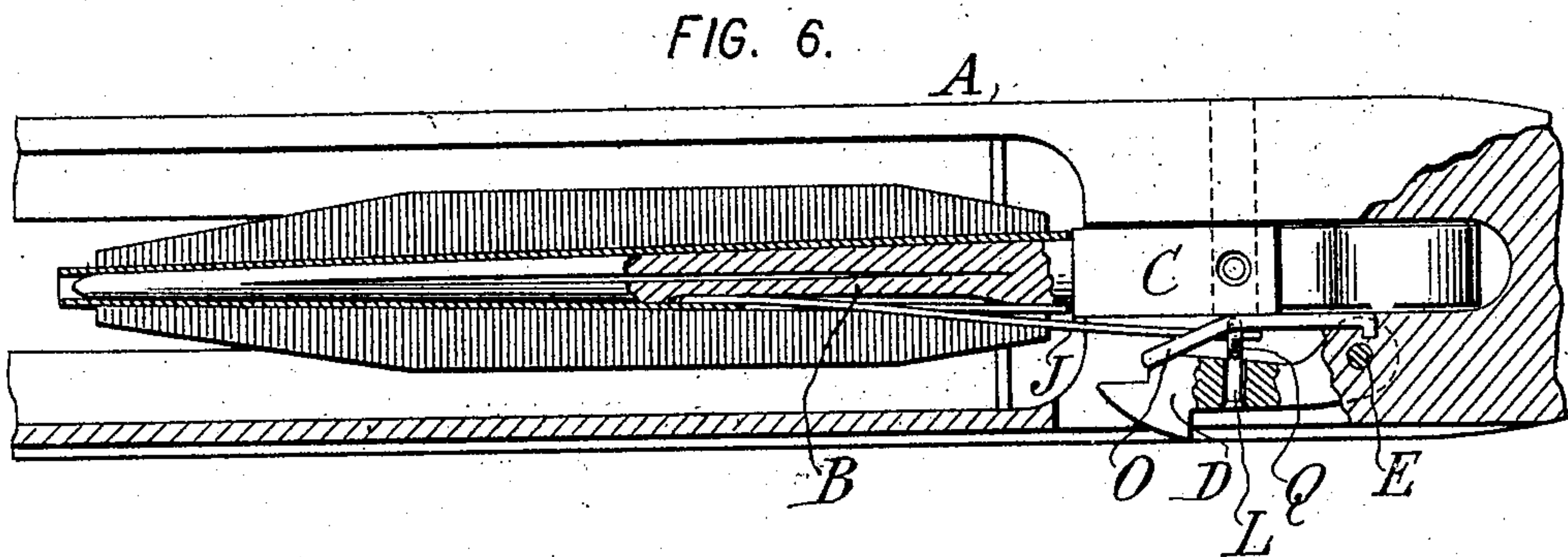
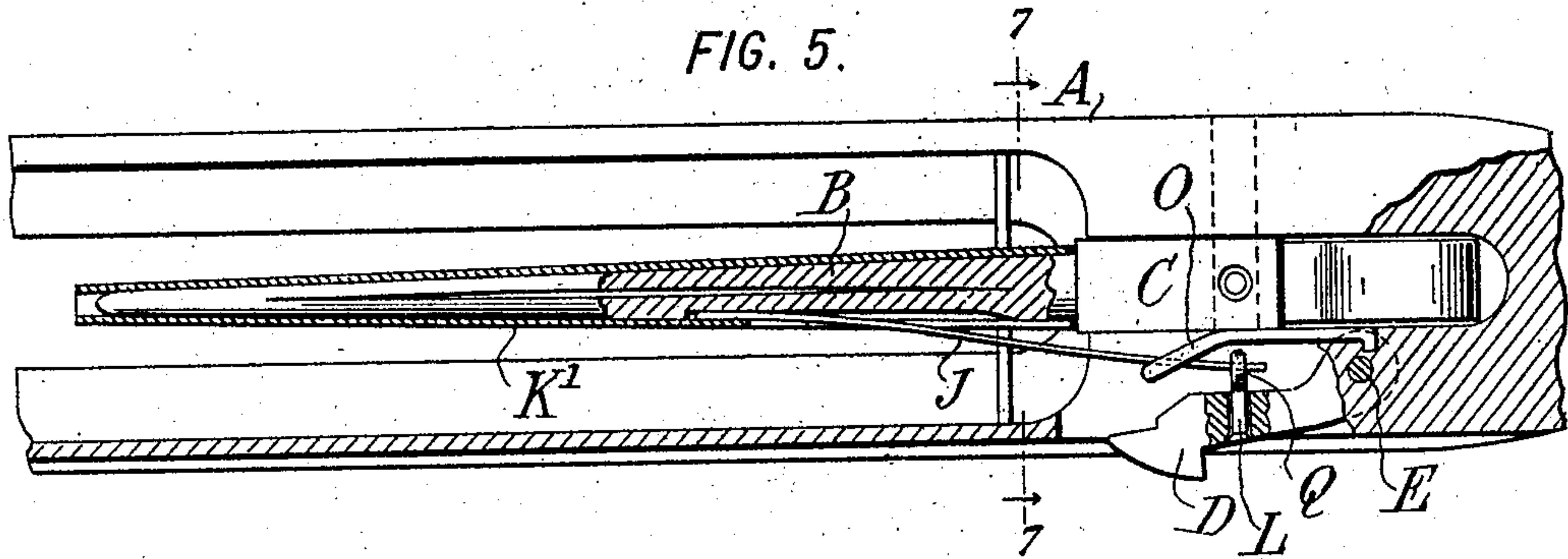
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WITNESSES:
Ired White
Rene' Ruine

INVENTORS:
Norbert Foerster, Daniel J. Carey and William A. Foster,
 By Attorneys,
Ruthen G. Orason & Co.

UNITED STATES PATENT OFFICE.

NORBERT FOERSTER, DANIEL JOSEPH CAREY, AND WILLIAM ASTON FOSTER, OF NEW YORK, N. Y.; SAID CAREY ASSIGNOR TO AMERICAN TEXTILE SPECIALTY MACHINERY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SHUTTLE.

No. 815,953.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed December 11, 1903. Renewed August 29, 1905. Serial No. 276,327.

To all whom it may concern:

Be it known that we, NORBERT FOERSTER, DANIEL JOSEPH CAREY, and WILLIAM ASTON FOSTER, citizens of the United States, residing in the borough of Manhattan, city, county and State of New York, have invented certain new and useful Improvements in Shuttles, of which the following is a specification.

This invention aims to provide an improved loom-shuttle especially designed for operating or controlling mechanism for stopping the loom or for supplying new weft or for similar purposes. Looms having mechanism of this kind are well known. The device provided for this purpose is very simple in construction, is easily applicable to shuttles already in existence, operates with great certainty, and is arranged to yield when it engages the loom mechanism improperly.

Various other points of improvement are specified in detail hereinafter

The accompanying drawings illustrate embodiments of the invention.

Figure 1 is a plan with the thread in the shuttle nearly exhausted, certain parts being broken away to illustrate the construction clearly. Fig. 2 is a plan, partly broken away, showing a full quill of thread on the spindle. Fig. 3 is a longitudinal section omitting certain parts for the sake of clearness. Fig. 4 is a side elevation. Figs. 5 and 6 are plans similar to Figs. 1 and 2, illustrating another construction. Fig. 7 is a section approximately on the line 7 7 of Fig. 5. Figs. 8 and 9 are respectively a plan and an inside face elevation of the mechanism-controlling lever of another construction. Figs. 10 and 11 are respectively a plan and a longitudinal section of another style of mechanism-controlling lever, Fig. 11 being taken on the line 11 11.

The shuttle A is preferably provided with a spindle B, pivoted at its square heel C, so that it may swing in a vertical direction and may be turned up to facilitate the application of a quill on the spindle. The usual flat spring may be employed for holding it firmly in either position. This is a common form of shuttle. The invention may be applied either to this form or to any other suitable form. An important feature of the invention is that an arm which controls the movement

of the mechanism-controlling device is pivotally connected to the latter, so as to permit of the use of the invention with a shuttle having a vertically-swinging spindle and so that the arm may be movable with the spindle to facilitate the application of the quill with the mechanism-controlling device in its inoperative position. The mechanism-controlling device is preferably a lever swinging horizontally, and the controlling-arm is preferably a spring which is connected at one end to the shuttle-spindle. Preferably, also, means are provided for automatically moving the device to its inoperative position on the turning up of the spindle. According to this improvement we are enabled to pivot the mechanism-controlling lever separately from the spindle, even though the arm for controlling said lever moves with the spindle. In looms having mechanism controlled by the shuttle this control is exercised usually at only one side of the loom, the shuttle-box and other parts of the loom at this side being specially constructed for the purpose. With relation to this special shuttle box or side of the machine the same end of the shuttle always enters in advance of the opposite end of the shuttle. It is preferable that the mechanism-controlling device carried by the shuttle shall be arranged near one end, which in use will be the advance end as the shuttle enters the special box above referred to. This insures that the device shall always enter the shuttle-box sufficiently to be effective, even when the shuttle enters only a slight distance, as is sometimes the case. A point of this invention is in forming the mechanism-controlling device with an abrupt shoulder in the direction of said forward or advance end of the shuttle and tapering in the opposite direction. By this construction the device will securely engage the coacting elements on the shuttle-box or on the side of the loom upon which the device operates and will thus render the operation certain. On the other hand, if the shuttle should completely pass said coacting elements before the thread is exhausted sufficiently to actuate the mechanism-controlling device the face of the device tapering in the opposite direction permits the device to pass said coacting elements on the return shoot without injury and also

to pass any other projecting part of the apparatus or any projecting threads without injury. The pivot of the swinging lever which preferably constitutes the mechanism-controlling device is in advance of the abrupt shoulder, so that the lever is subjected to a direct pull in operation, which holds it firmly in position, the pivot being mounted at one side of the spindle and as near the side of the shuttle as practicable in order that the strain shall be a direct pulling strain as nearly as possible.

Referring now to the embodiment illustrated in Figs. 1 to 4, the mechanism-controlling device is a horizontal swinging lever D, pivoted at E, having at its rear end a projecting portion with an abrupt shoulder F and a tapered end G. In dotted lines is shown a member H, representing any suitable element on the shuttle-box or loom with which the lever D coacts. The arrow shows the forward direction in which the shuttle is moving, and the abrupt shoulder F of the lever will engage the member H and the lever will be pulled backward almost in a straight line from its pivot, so that the tendency to deflect laterally will be very slight and will be overcome by the friction of the engaging surfaces. If the lever should meet with any obstruction in the movement of the shuttle in the opposite direction, the tapering face G will immediately cause the lever to be pressed inward, so as to readily pass such obstruction. In order to swing the lever D from its operative position, Fig. 1, to its inoperative position, Fig. 2, an arm J is connected to the lever and is connected at its other end to the spindle B. When the quill K, containing a considerable quantity of thread, is on the spindle, the thread presses the arm J inward and pulls the lever to the position of Fig. 2. When the thread runs out or nearly out, the arm J is released and the lever is thrown outward. The arm J is preferably a spring soldered or otherwise fixed at one end to the spindle B and connected at its other end to a pin L, which reciprocates in the hollow shaft M of the spindle and which is swiveled in the lever D to permit the pin to rotate. Preferably a key or enlargement N is formed on the spindle at the point of connection of the arm J to form a guide fitting in the slot of the quill K, as shown. As the spindle B is turned up to receive a new quill the arm J moves with it, the pin L turning to permit this. At the same time a wire cam O, which lies in the path of the arm J, forces the latter inward, carrying with it the pin L and the lever D. Pins P may be provided on the heel of the spindle, engaging the intermediate part of the arm J to assist in moving it evenly with the spindle B, or the pins P may be relied on alone to swing the arm J up and down, said arm being not otherwise connected with the spindle.

The pivotal connection of the arm J with

the mechanism-controlling device may be effected in various ways, it being only necessary to this feature of the invention that the arm shall be capable of swinging with the shuttle-spindle and shall also move in and out laterally with the mechanism-controlling device. For example, as shown in Fig. 5, the end of the arm J may pass through an eye Q of a pin L, which is swiveled in the lever D. We have shown in this case a quill K' of paper, the arm J being soldered in a groove in the spindle to permit the use of such a quill and the pins P being also dispensed with.

In Figs. 8 and 9 there is shown a fixed eye R, arranged at such an angle and of such a size that the arm J may pass through the same whether standing in the horizontal position (shown in full lines) or the substantially vertical position (shown in dotted lines) without interrupting its sufficient engagement with the mechanism-controlling device. Figs. 10 and 11 show another construction serving the same purpose. The lever D is formed with a slot S, in which the arm J lies in either a horizontal or a vertical position and in which it moves the lever either inward or outward as the arm itself is moved.

Though we have described with great particularity of detail certain embodiments of the invention, yet it is not to be understood that the invention is limited to the specific embodiments disclosed.

Various modifications thereof in details and in the arrangement and combination of the parts may be made by those skilled in the art without departure from the invention.

What we claim is—

1. In a shuttle having a vertically-swinging spindle, in combination, a mechanism-controlling device, and an arm movable with the shuttle-spindle and pivotally connected with said device to permit the turning up of the spindle.

2. In a shuttle having a vertically-swinging spindle, in combination, a swinging mechanism-controlling lever, and an arm movable with the shuttle-spindle and pivotally connected to said lever to permit the turning up of the spindle.

3. In a shuttle having a vertically-swinging spindle, in combination, a mechanism-controlling device, and a spring-arm connected at one end to the shuttle-spindle and pivotally connected at the other end to said device to permit the turning up of the spindle.

4. In a shuttle having a vertically-swinging spindle, in combination, a swinging mechanism-controlling lever, and a spring-arm connected at one end to the shuttle-spindle and pivotally connected at the other end to said lever to permit the turning up of the spindle.

5. In a shuttle having a vertically-swinging spindle, in combination, a mechanism-controlling device, an arm movable with the

shuttle-spindle and pivotally connected with said device to permit the turning up of the spindle, and means engaging said arm for moving said device to its inoperative position automatically on the turning up of the spindle.

6. In a shuttle having a vertically-swinging spindle, in combination, a horizontally-swinging mechanism-controlling lever D, an arm J pivotally connected to said lever and movable with said spindle, and a cam in the path of said arm and arranged to force the same inward as said spindle is turned up.

7. In a shuttle having a vertically-swinging spindle, in combination, a mechanism-controlling device, a key N on said spindle, and an arm pivotally connected to said mechanism-controlling device and movable with the shuttle-spindle.

8. In a shuttle, in combination, a swinging mechanism-controlling lever and an arm connected to said lever and controlled by the thread in the shuttle to swing said lever to its inoperative and to its operative positions.

9. In a shuttle having a vertically-swinging spindle, in combination, a mechanism-controlling lever pivoted separately from the spindle, and means for swinging said device to its inoperative position automatically on the turning up of the spindle.

10. In a shuttle having a vertically-swinging spindle, in combination, a mechanism-controlling lever pivoted separately from the

spindle, and means connected to said lever and controlled by the thread in the shuttle to swing said lever to its inoperative and to its operative positions.

11. In a shuttle, a mechanism-controlling device carried near one end of the shuttle and having a projecting portion with an abrupt shoulder in the direction of said end of the shuttle and tapering in the opposite direction.

12. In a shuttle, a pivoted mechanism-controlling lever having a projecting portion abruptly shouldered on the side toward the pivotal point and tapered on the side away from the pivotal point.

13. In a shuttle, a mechanism-controlling device mounted at one side of the shuttle-spindle and having a projecting portion with an abrupt shoulder on one side and tapered on the opposite side.

14. In a shuttle, in combination, a swinging mechanism-controlling lever and a reciprocating pin connected thereto.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

NORBERT FOERSTER.
DANIEL JOSEPH CAREY.
WILLIAM ASTON FOSTER.

Witnesses:

I. S. LAMBERT,
MARGARET McDERMOTT.