

No. 666,501.

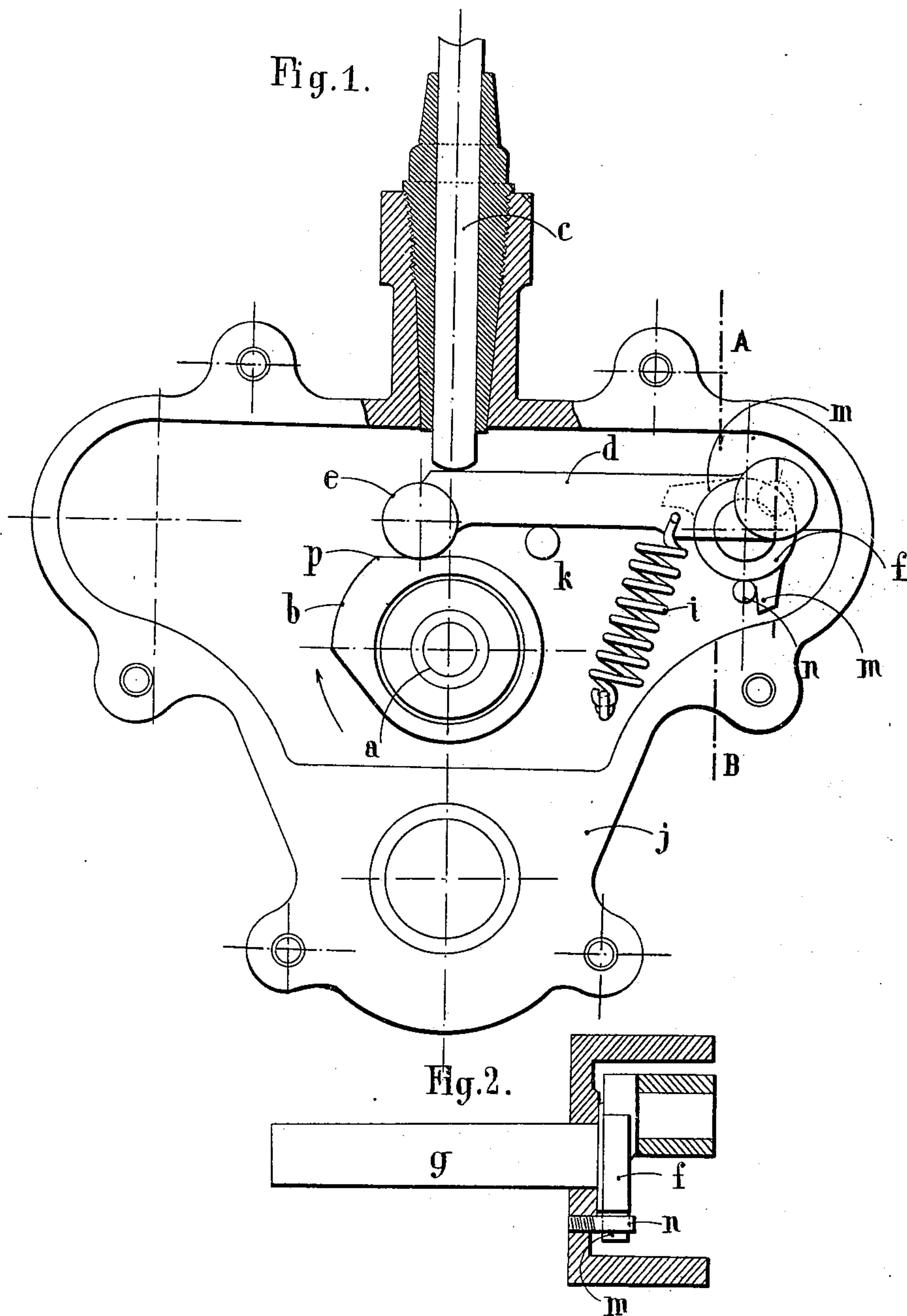
Patented Jan. 22, 1901.

A. DE DION & G. BOUTON.
SPEED REGULATOR FOR EXPLOSIVE ENGINES.

(Application filed June 8, 1900.)

(No Model.)

3 Sheets—Sheet 1.



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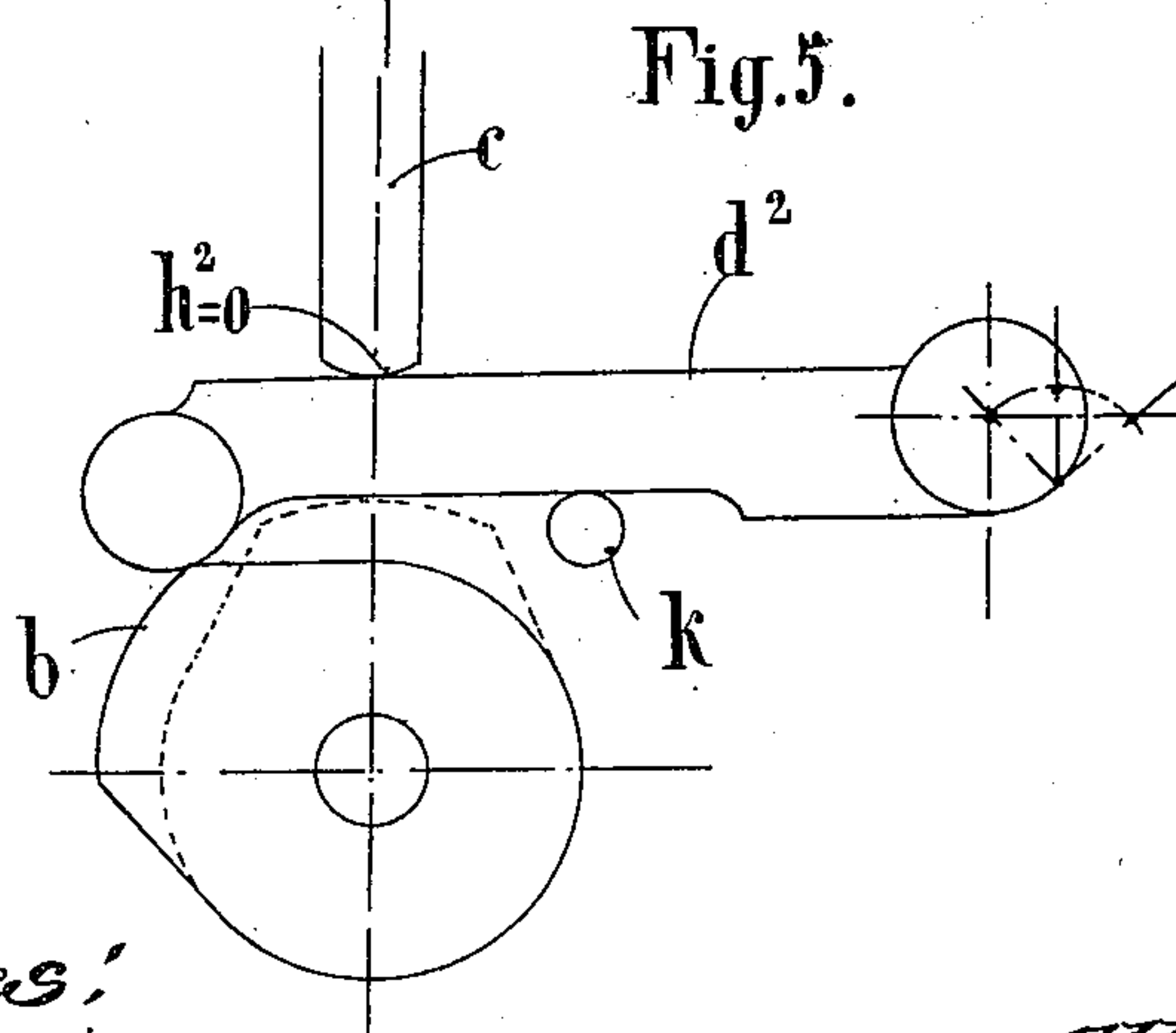
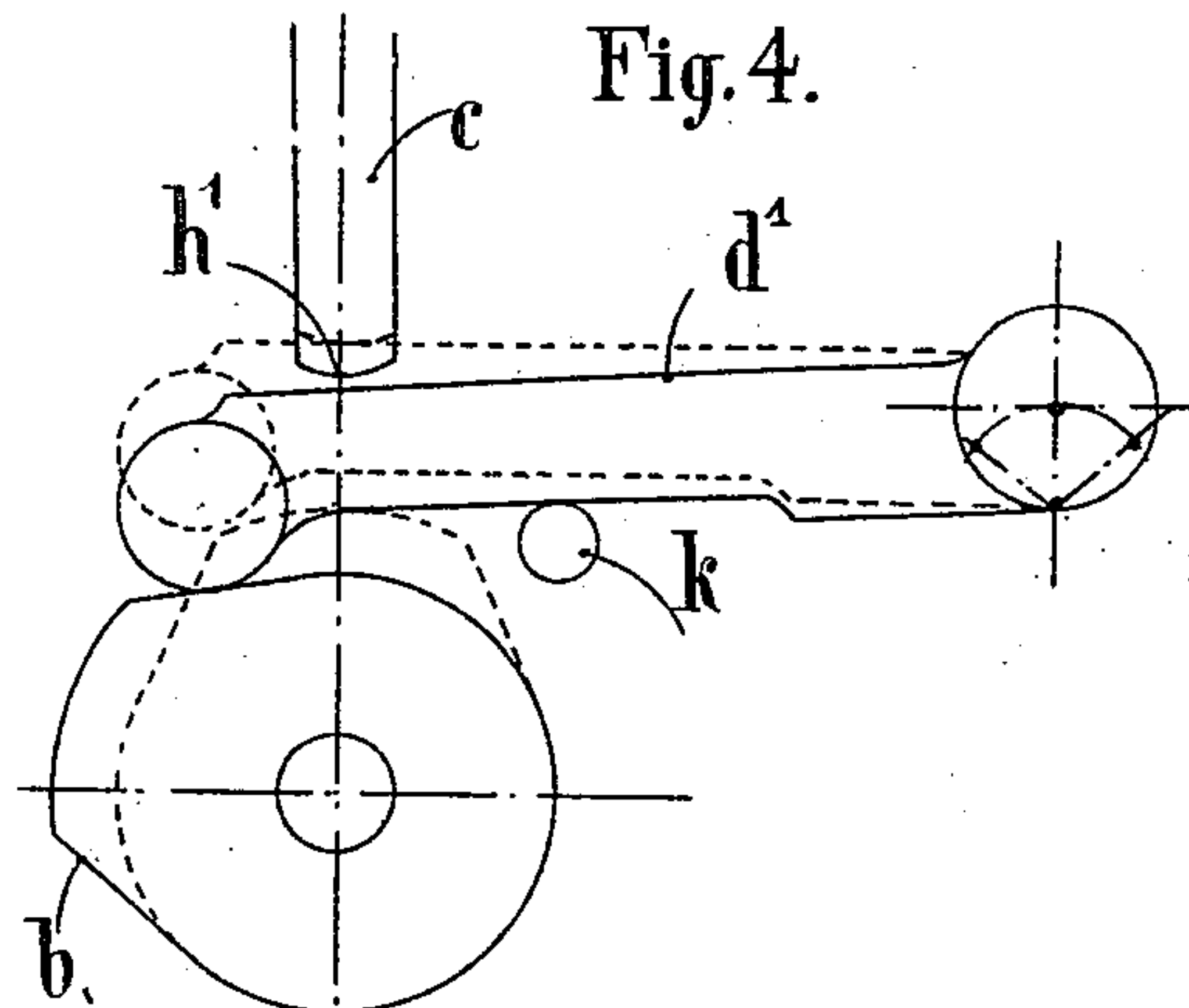
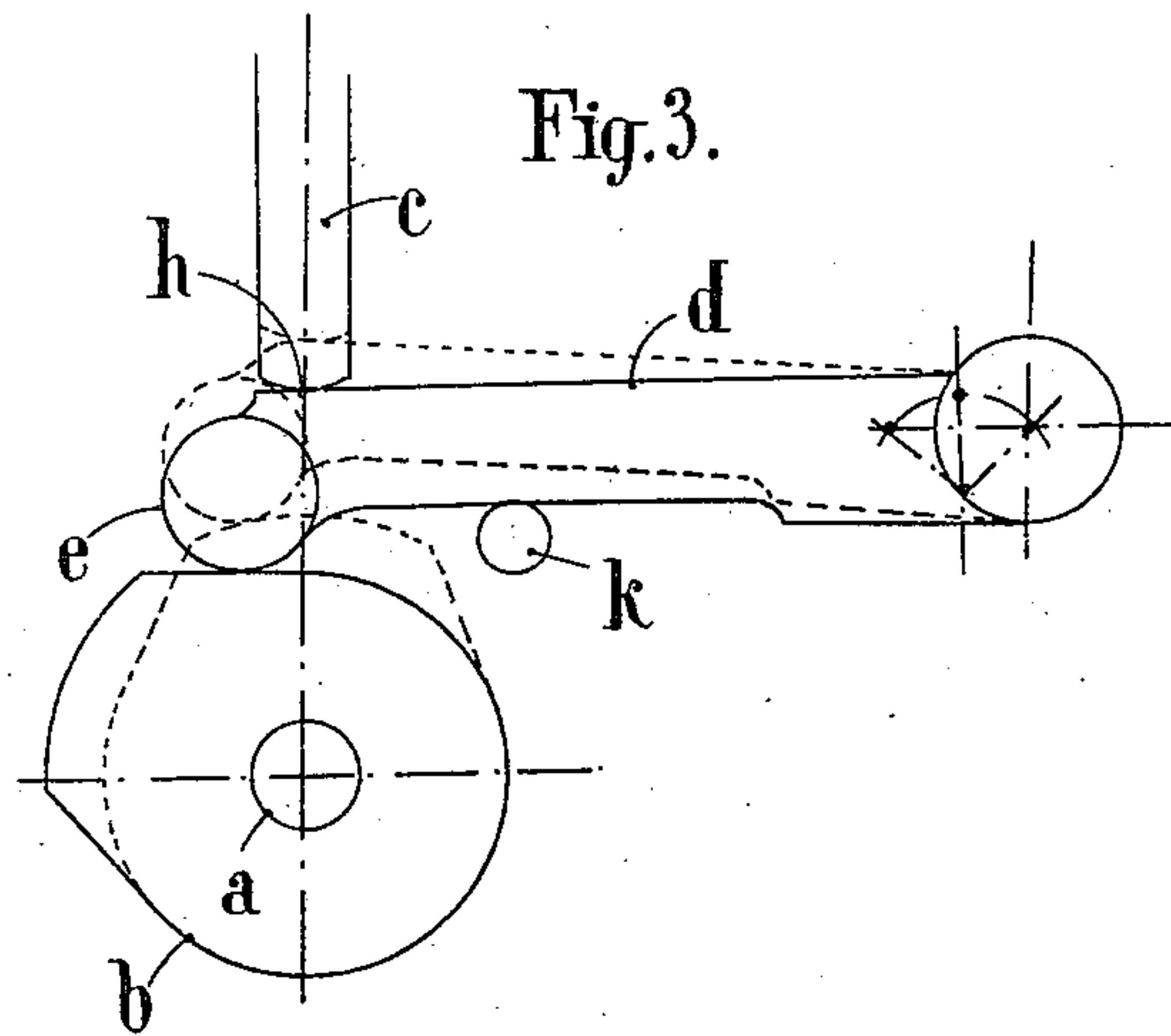
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3 Sheets—Sheet 2.



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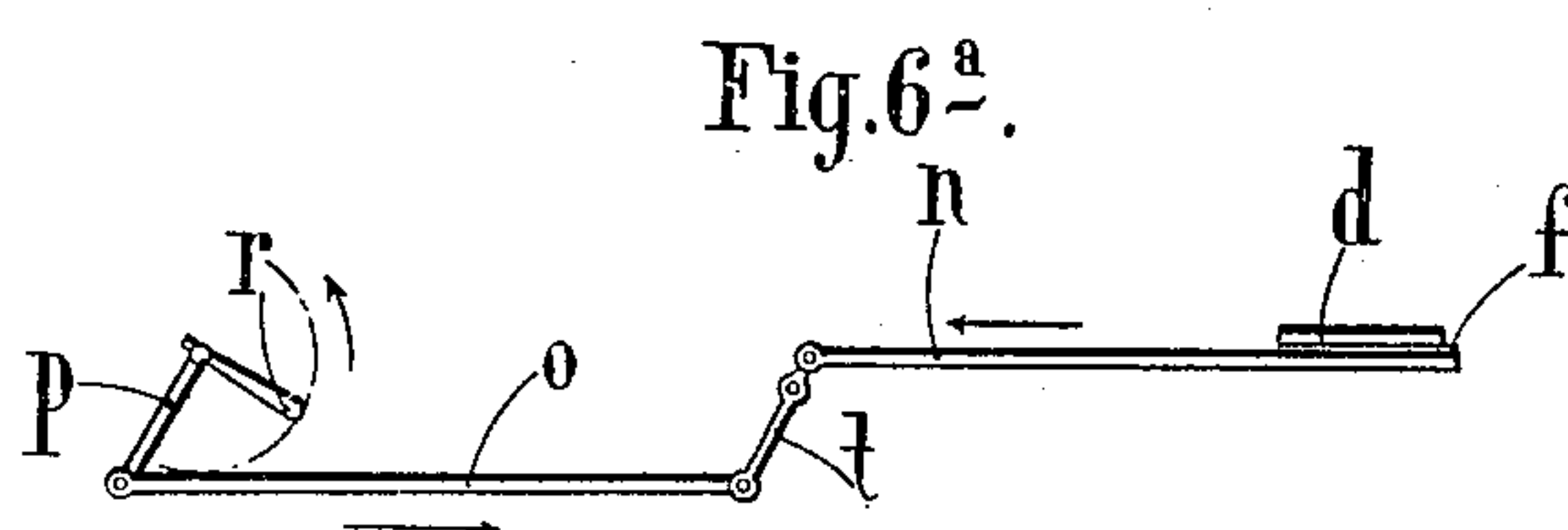
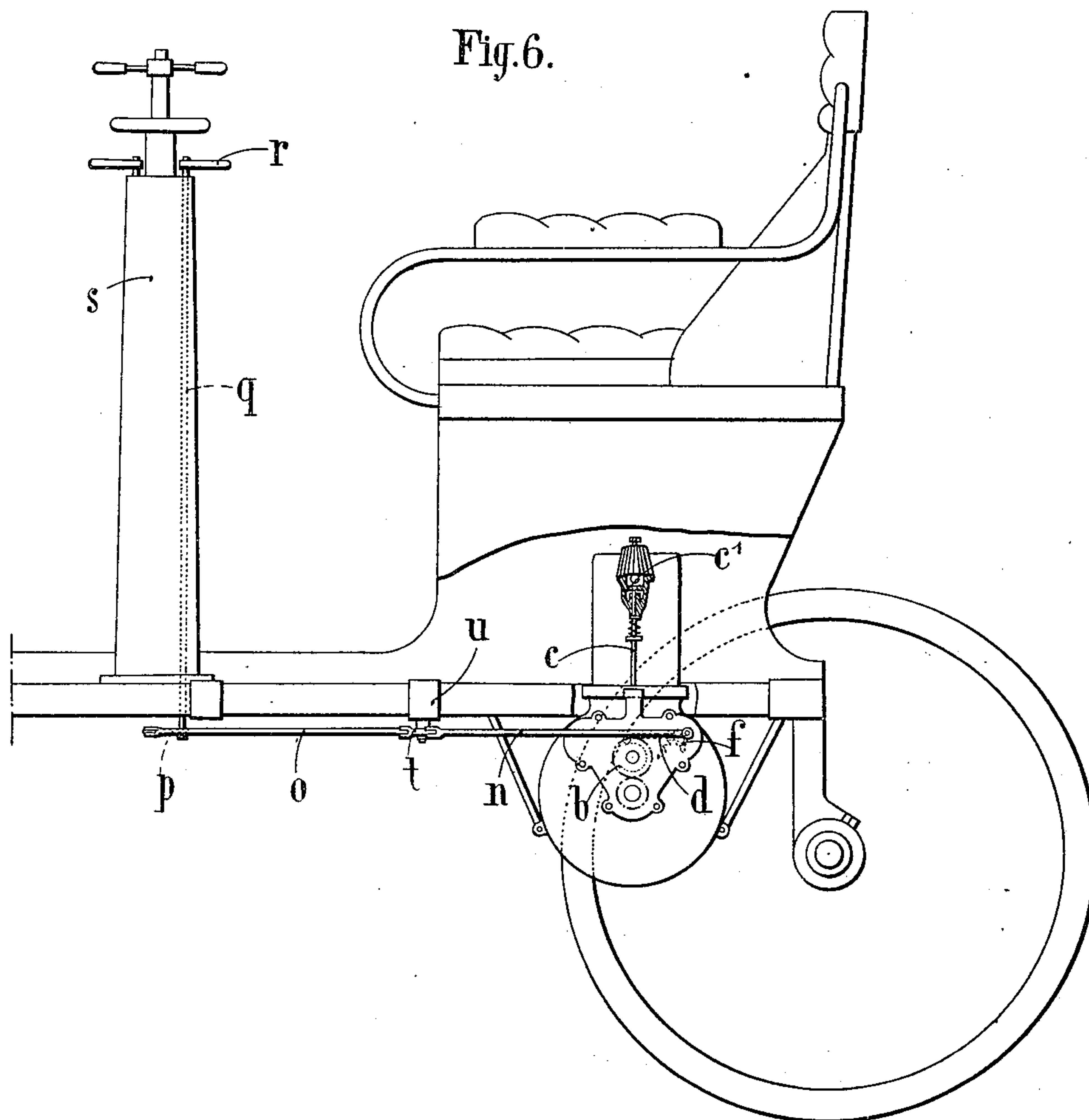
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(Application filed June 8, 1900.)

(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

ALBERT DE DION AND GEORGES BOUTON, OF PUTEAUX, FRANCE.

SPEED-REGULATOR FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 666,501, dated January 22, 1901.

Application filed June 8, 1900. Serial No. 19,601. (No model.)

To all whom it may concern:

Be it known that we, ALBERT DE DION and GEORGES BOUTON, engineers, citizens of the Republic of France, residing at 24 Quai National, Puteaux, Seine, France, have invented certain new and useful Improvements in Means for Regulating the Speed of Explosion-Motors, of which the following is a specification.

10 This invention relates to certain new and useful improvements in means for varying the speed of explosion-motors, especially those employed upon self-propelling vehicles; and it has for its object to provide a device by
15 which the driver can himself from his seat regulate the speed without the intermedium of the governor or vary this speed without operating a cock controlling the amount of gas going to the cylinder or varying the com-
20 position of the explosive mixture.

The device according to the present invention acts in the well-known manner, which consists of varying the lift of the exhaust-valve, so as to leave a greater or less quantity of burned gases in the cylinder; and the
25 said device consists of making the stem of the exhaust-valve shorter than the required length and by interposing between the said stem and the cam designed to raise it a wedge
30 of peculiar form, capable of longitudinal displacements, which latter vary the lift of them, without, however, varying the timing of the exhaust.

Our arrangement allows of the speed of the
35 motor being reduced as much as desired and even of completely stopping the said motor.

In order that this invention may be readily understood, reference is had to the accompanying drawings, forming a part of this specification, and in which—
40

Figure 1 is a front view of one construction of our speed-regulating device. Fig. 2 is a section thereof on the line A A' B' B of Fig. 1. Figs. 3, 4, and 5 are diagrammatic views for
45 the purpose of explaining the working of our mechanism. Fig. 6 shows the arrangement of the same on a self-propelled vehicle; Fig. 6^a, the means employed for operating the said speed-regulating device.

50 On the cam-shaft *a* is mounted the cam *b*, controlling the lift of the exhaust-valve through the intervention of its stem *c*.

Our invention consists of interposing between the cam *b* and the stem *c* of the exhaust-valve *c'* (only shown in Fig. 6) a bar 55 or arm *d* of special form, which is movable and is capable of occupying various positions corresponding to various lifts of the escape-valve. This bar consists of a horizontal part, of any suitable cross-section, terminating (at 60 the end located between the cam *b* and the stem *c* of the valve) in a head *e*. At the opposite end said bar is connected to a piece *f*, forming a crank, and keyed to the end of the shaft *g*, Fig. 2, which crank is operated from 65 a convenient part of the vehicle, as herein-after described. This piece is provided with two lugs *m*, which limit its oscillations by striking against a small stop *n*, the result being that an endwise movement is imparted 70 to the bar *d*. The portion of the stop *n* is regulated according to the displacement to be given to the bar *d*. A spring *i*, having one of its free ends fixed to the box *j*, presses the bar *d* continually against a small stud *k*, 75 also fixed to this box and serving as a guide for said bar.

Figs. 6 and 6^a show the manner in which the crank *f* is operated, the device being arranged on a self-propelled vehicle. 80

Extending through the column *s* is a stem or rod *g*, supported in convenient manner into bearings fitted on the said column and carrying at its upper extremity a handle *r* and having keyed on its lower extremity a 85 crank *p*. The said crank *p* is connected to the piece or crank *f* by means of two links *o* and *n*, attached, respectively, at one of their ends to the said pieces *f* and *f* and at their other extremities to a lever *t*, pivoted on a 90 support *u*, fixed to the framing of the vehicle.

By examining Fig. 6^a it is clearly understood that by operating the handle *r* (which can be acted on by the driver from his seat) a lengthwise displacement will be imparted 95 to the rods *n* and *o*, and therefore to the wedge or bar *d*.

Our mechanism being arranged as just described, with the cam *b* turning in the direction of the arrow, works in the following manner: 100 When the bar *d* is in the position corresponding to the maximum exhaust, Figs. 1 and 3, the lift of the valve is normal and equal to *h*, which is the difference between

the larger and smaller radius of the cam. If the bar be shifted to the left, so as to bring it into the position d' , Fig. 4, it will be seen that the lift of the valve, equal to h' , has already a less value, which will diminish in proportion as one continues to push the bar d toward the left. Finally, for the position d^2 , Fig. 5, of this bar there is not lift for the valve and there is not exhaust possible. It will be seen that the lift of the valve thus can only commence when the bar d touches its lower end—that is, when the bar has covered the space existing between it and the said stem—as, for instance, in Fig. 4. The displacement of the bar d being sensibly horizontal, this contact will always take place when the flat p of the cam is horizontal—that is to say, that the exhaust will always commence at the same moment of the cycle. It also ceases at the same moment, so that the duration of the said exhaust being constant gas which escapes is therefore only dependent of the amount of lift of the valve. In other words, the quantity of gas which escapes varies, but the timing of the escape remains constant. This is one of the essential points of our invention. At each revolution of the motor there will remain in the cylinder a certain quantity of burned gases, varying with the position of the bar d . These gases are compressed during the rear stroke of the piston and become expanded during the first part of the forward stroke, so retarding the suction. It results therefrom that the suction is

so much the less, according as the exhaust has been the shorter. The speed of the motor will therefore be diminished proportionately.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a means for regulating the speed of explosive motors, the combination with an exhaust-valve and a cam operating the same, of a bar interposed between the said valve and said cam, and provided on one end with a head adapted to be engaged by said cam, a crank-piece pivoted to the other end of said bar, a stud k , a spring for keeping said bar normally in engagement with said stud, and means connected to said crank-piece for oscillating the same, imparting thereby lengthwise displacement to the said bar.

2. In a speed-regulating device of the character described, a bar d adapted to operate the exhaust-valve of an explosive motor, and means for actuating the said bar, consisting of a rod q provided with a suitable handle, a crank p , links o and n and crank-piece f , substantially as shown and described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

ALBERT DE DION.
GEORGES BOUTON.

Witnesses:

EDWARD P. MACLEAN,
EMILE KLOTZ.