

No. 882,394.

PATENTED MAR. 17, 1908.

J. KRANNICHFELDT.
CONTACT APPARATUS FOR ELECTRIC IGNITERS.

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Fig. 1.

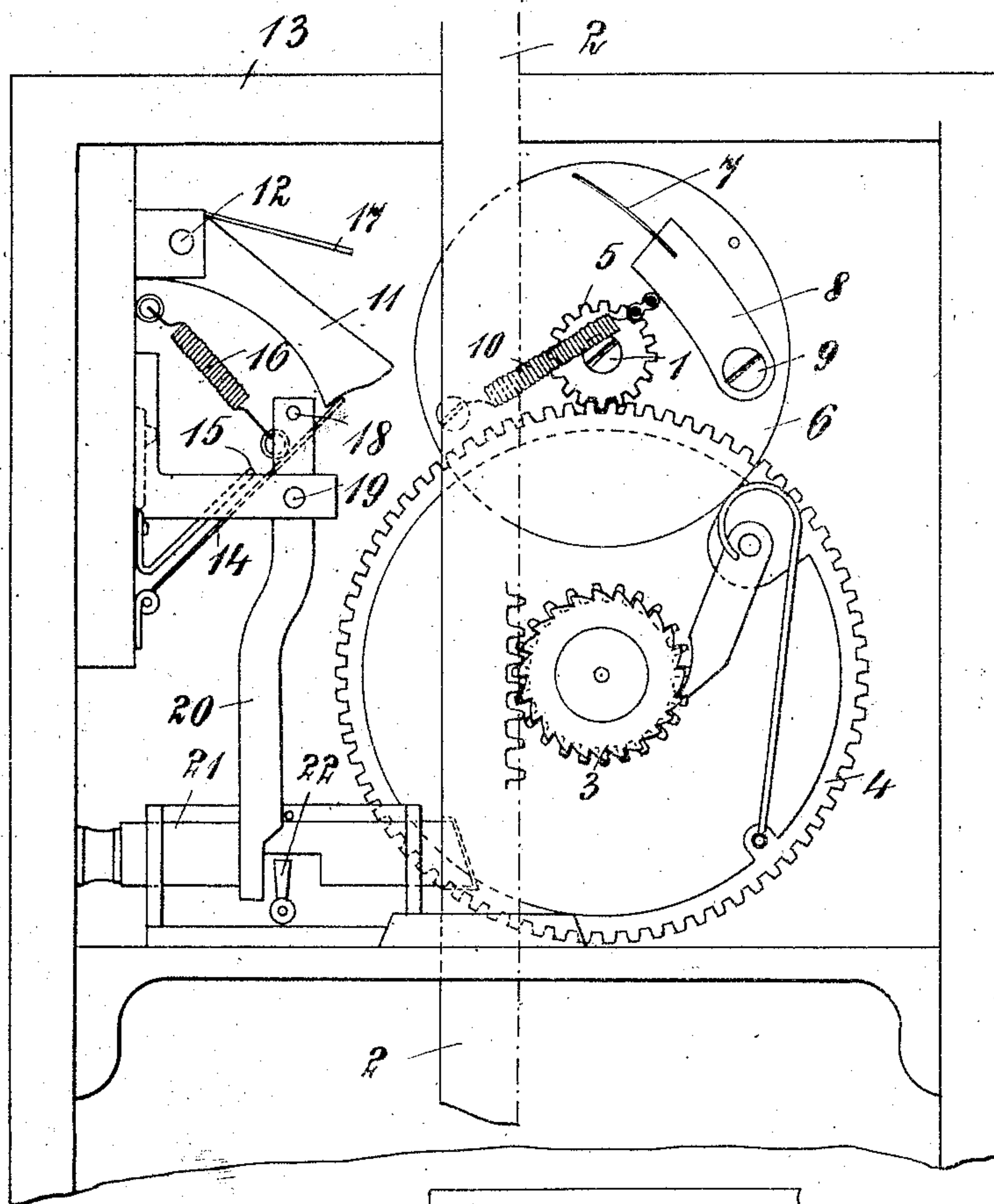
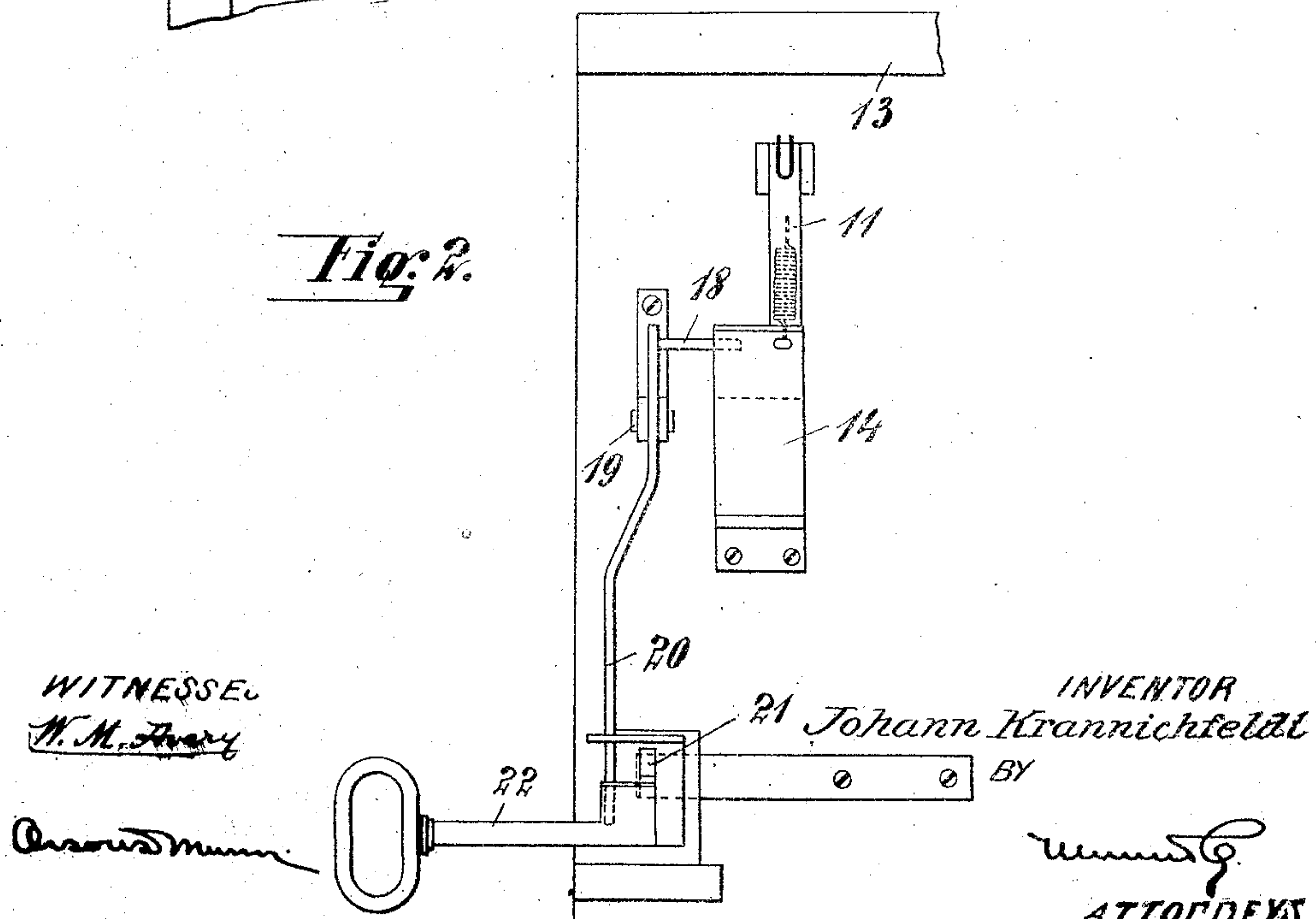


Fig. 2.



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CONTACT APPARATUS FOR ELECTRIC IGNITERS.

No. 882,394.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed December 16, 1905. Serial No. 292,018.

To all whom it may concern:

Be it known that I, JOHANN KRANNICHFELDT, a subject of the King of Prussia, residing in Cologne-on-the-Rhine, in the German Empire, have invented new and useful Improvements in Contact Apparatus for Electrical Igniters, of which the following is a specification.

My present invention relates to magnetic induction apparatus or dynamo apparatus for firing electric igniters such as are used for blasting purposes in connection with mines, and the object of my improvements is firstly to prevent the circuit of the igniters being closed until sufficient current is generated to fire all the igniters and secondly to close the circuit of the igniters without occasioning vibrations of any kind.

In the accompanying drawings illustrating the invention: Figure 1 is an elevation showing one way of closing the circuit of the igniters by the action of a centrifugal piece, Fig. 2 is a side elevation of the same.

In the form shown in Figs. 1 and 2, the armature spindle 1 is put into rapid rotation by depressing the rack 2 and by intervention of the toothed wheels 3, 4, 5. On spindle 1 is mounted a disk 6, carrying a centrifugal piece 8, terminating in a spring 7, pivot mounted at 9, and normally maintained within the circumference of the disk, by a spring 10. In the plane of the centrifugal piece 8 is a latch 11, which, at 12, is pivoted to the casing 13 of the apparatus, and, whose free end serves to hold the contact piece, 14, which is in the form of a spring, at a slight distance from the contact piece 15. When, by a strong depression of the rack 2 the disk 6 is rotated rapidly enough, the centrifugal piece 8 acted upon by centrifugal power, will, with its spring 7 strike the lower end of latch 11, so as to set free the contact 14, which, thereupon, will be brought into contact with the contact piece 15 by the action of the spring 16, while the latch 11, whose upward motion is limited by a striking piece 17, will fall upon the contact piece 14 and remain lying there until the circuit is interrupted.

To insure that the circuit of the igniting apparatus is interrupted before the rack 2 can again be operated for a fresh set off, it will be convenient to provide a lever 20, fulcrumed at 19 and carrying a pin 18 and whose lower end is operated by a key 22, which also serves for releasing the snap-

block 21 of the rack 2, so that the contact piece 14 may be separated from the contact piece 15, thereby enabling the latch 11 again to fall behind and hold back the contact piece 14.

The operation of the apparatus is as follows:—In the position of rest, with the igniting circuit closed, the contact piece 14 bears against the contact piece 15 and the latch 11 upon the piece 14 and the rack 2 is in its lowest position and locked by the bolt 21. To set the apparatus the key 22 is turned towards the left so as to cause the lever 20 to push the contact piece 14 away from the contact piece 15 till the latch 11, engages behind, and holds, said contact piece 14. This enables the rack 2 to be lifted and depressed in order to turn the toothed wheel 3 in engagement therewith, and in the lowest position the bolt 21 will again fall into the notch of said rack 2 and lock the same. Now, if the rack is pushed down sufficiently rapidly or with sufficient force, the centrifugal piece 8 will fly out sufficiently to throw off the latch 11 and enable the parts 14 and 15 to make rubbing contact. If the movement is too slow, the centrifugal piece 8 will not reach the latch 11 and no current will pass in the igniting circuit, and the parts 14 and 15 will remain out of contact.

What I claim and desire to secure by Letters Patent is:—

1. Magnet induction apparatus for electric blasting, comprising in combination, a rotary disk, a centrifugal piece pivoted to said disk, means restraining said centrifugal piece, a contact disposed in proximity to said centrifugal piece and adapted to close said circuit when said centrifugal piece has attained a certain speed, and a rack adapted to drive said disk, substantially as, and for the purpose, set forth.

2. Magnet induction apparatus for electric blasting, comprising in combination, a rotary disk, a centrifugal piece pivoted to said disk, means restraining said centrifugal piece, a contact disposed in proximity to said centrifugal piece and adapted to close said circuit when said centrifugal piece has attained a certain speed, a rack adapted to drive said disk, and means to hold said rack in the bottom position, substantially as, and for the purpose, set forth.

3. Magnet induction apparatus for electric blasting, comprising in combination, a rotary disk, a centrifugal piece pivoted to said disk,

means restraining said centrifugal piece, contacts disposed apart in proximity to said centrifugal piece, means adapted to bring said contacts together and close the circuit when
5 said centrifugal piece has attained a certain speed and touches one of said contacts, and means enabling said disk to be operated by hand, substantially as set forth.

4. Magnet induction apparatus for electric
10 blasting, comprising in combination, a rotary disk, a centrifugal piece pivoted to said disk, means restraining said centrifugal piece, a contact disposed in proximity to said centrifugal piece and adapted to close the circuit
15 when said centrifugal piece has attained a certain speed, a rack adapted to drive said disk, a notch in said rack, a bolt adapted to engage in said notch, and a key to move said bolt and thus release said rack, substantially
20 as, and for the purpose, set forth.

5. Magnet induction apparatus for electric blasting, comprising in combination, a rotary

disk, a centrifugal piece pivoted to said disk, means restraining said centrifugal piece, a contact disposed in proximity to said centrif- 25 ugal piece and adapted to close the circuit when said centrifugal piece has attained a certain speed, a rack adapted to drive said disk, a notch in said rack, a bolt adapted to engage in said notch, a key to move said bolt 30 and thus release said rack, a lever likewise adapted to be moved by said key and thus to move the contact and open the circuit closed by the action of said centrifugal piece, and a catch adapted to hold said contact in the 35 open position, substantially as, and for the purpose, set forth.

In witness whereof I have hereunto signed my name this 23d day of November 1905, in the presence of two subscribing witnesses.

JOHANN KRANNICHFELDT.

In presence of—

BESSIE F. DUNLAP,
LOUIS VANDORN.