

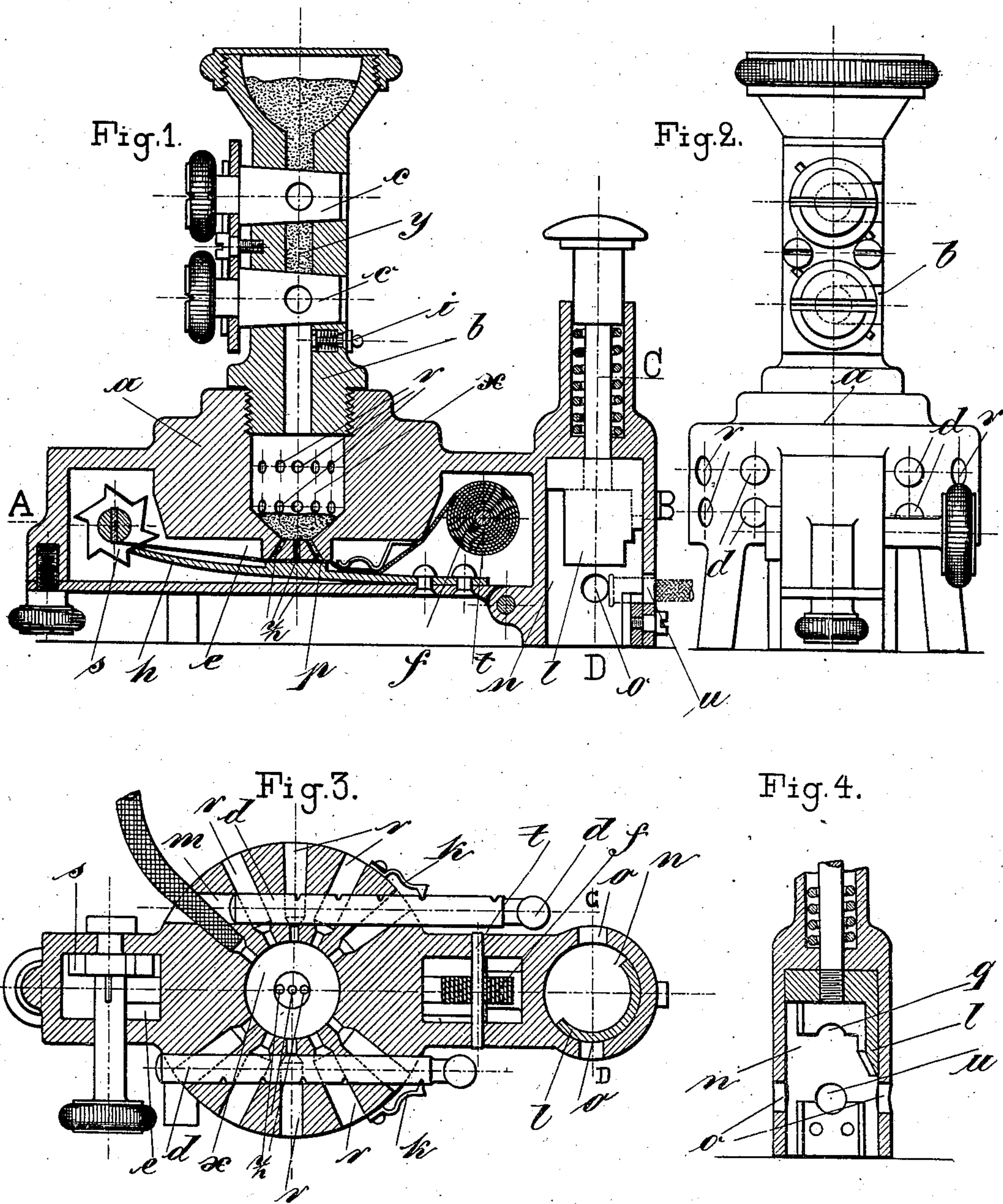
No. 720,104

PATENTED FEB. 10, 1903.

J. VON DER BOSCH.
 DEVICE FOR THE IGNITION OF SLOW MATCHES.

APPLICATION FILED SEPT. 23, 1902.

NO MODEL.



Witnesses:
 William Schuch.
 Arthur Gruen.

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UNITED STATES PATENT OFFICE.

JACOB VON DER BOSCH, OF ESSEN-ON-THE-RUHR, GERMANY.

DEVICE FOR THE IGNITION OF SLOW-MATCHES.

SPECIFICATION forming part of Letters Patent No. 720,104, dated February 10, 1903.

Application filed September 23, 1902. Serial No. 124,521. (No model.)

To all whom it may concern:

Be it known that I, JACOB VON DER BOSCH, a citizen of the German Empire, and a resident of Augustinerstrasse No. 1, Essen-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Devices for the Ignition of Slow-Matches, of which the following is a specification.

My invention relates to a device for igniting match-cords or slow-matches for blasting purposes, working absolutely independent of any exterior influences.

The object of my invention is to provide a contrivance for the aforementioned purpose specially adapted for use in mines or pits on account of its perfect safety. Another advantage is that any number of matches can be ignited at one time or one match only or several matches in any desired time or intervals. The device affords also facilities for a measured division of the slow-matches in certain measured lengths to determine the time between the ignition of the match and that of the explosive in the mine and for supplying the match end with a percussion-cap to make the ignition certain whenever this should be deemed necessary or desirable. I attain these objects by the apparatus herein described and illustrated by the drawings submitted with this application.

Figure 1 is a longitudinal section of my improved apparatus for igniting slow-matches; Fig. 2, an end view thereof; Fig. 3, a horizontal section on line A B, Fig. 1; and Fig. 4 a cross-section on line C D, Figs. 1 and 3.

The drawings show an apparatus by which twenty slow-matches may be ignited all at one time or only one or a few of them within certain intervals, to be determined as may be desired.

As shown by the said drawings, the ignition of the matches or match is effected within a compartment x , which is so perfectly closed that the blast of the explosive within will in no way get in touch with the air outside. I attain this by providing the apparatus, which may be made of any suitable material, with a special contrivance for shutting those of the openings provided for the insertion of the matches into which no match is intended to be inserted.

The apparatus is more particularly illus-

trated by Fig. 1 of the aforesaid drawings. The portion of the device which is marked a comprises the aforementioned compartment 55 or powder-chamber x , which is closed by a screwed-on head-piece b . The powder or other explosive by which the match or matches are to be ignited are put into said compartment through a funnel-shaped opening on the top and two conical cocks c , the space between said cocks being used as a measure for the quantity of powder to be put into said chamber x . For placing the powder into the same the upper cock is turned open, the aforementioned space y filled with powder and closed 65 again. Then the lower cock c will be opened, so that the powder drops into the chamber x , and also closed. In order to prevent any powder intended for explosion in chamber x from getting out of the device, each of the aforesaid cocks may be provided with a spring or other device for the automatic tight closing of the cocks at once after use.

In the lower portion of the apparatus there 75 are provided a number of channels r , arranged side by side and above each other, and suitable sliding bars d , by which all of the said channels or only a few of them may be tightly and fireproof closed. The channels 80 leading to the compartment x . (See Figs. 2 and 3 of the drawings.) At the bottom of the chamber x there are vents z , leading to a box-trap e . Within the latter there is a paper-strip match f , while on a place just opposite a ratchet-wheel s , with a ratchet or pawl, 85 is provided, pressing toward a spring or hammer h , which when flinging from the said ratchet or pawl hits the match-strip at the place indicated by p , igniting the explosive substance on the same. The sparks produced 90 by the ignition enter the chamber x through the vents z and explode the powder or other substance in the compartment.

In the apparatus illustrated by the draw- 95 ings the spring is actuated by the ratchet-wheel s , the spindle of which takes up the match-strip, winding off from the place indicated on the drawings by t . The match-cords are inserted into the channels r , as is shown 100 in Fig. 3, and put in until arrested by the narrowing of the channels. When the powder explodes, all of the match-cords inserted will ignite and are then removed ready for use.

Those of the channels which contain no match ends are tightly closed by the sliding bars *d*, so that an escape of the flame is impossible. The sliding bars are so arranged that they cross a cavity *m* within the channels *r* and can shut or open all of the channels *r* or a number of them, according to want. The sliding bars may be round or flat. They may also be provided with a screw-thread and screwed into the aforesaid cavity *m*. In the drawings they have small notches to catch a spring-latch *k*, holding the bars fast to the mouths of the channels and preventing an accidental moving of the bars and at the same time indicating by catching another notch the place where any of the channels are not shut. Opposite to the spindle on which the small wheel *s*, actuating the spring *h*, moves there is provided a device for cutting the slow-match, and opposite to this device there is a contrivance for pressing a percussion-cap to one end of the slow-match. The match is put into the mouth *o* and the knife pressed downward against the direction in which the action of the spring works, and the match is thus cut through. This cutting device renders a division of the match and cutting exact lengths according to measure possible and enables a prediction of the exact time how long the match will burn until it ignites the explosive in the pit. The percussion-cap is put to one end of the match and inserted into the opening *u*, whereupon the knife *l* is moved downward. A notch *g* in the latter will thereby exert a pressure upon the cap at the end of the match, squeeze it slightly, and cause it to hold fast thereon. If the match-cord has been prop-

erly prepared, no cap will of course be necessary. A safety-valve may also be attached to the explosion-chamber of the apparatus to avoid any too-strong pressure caused by a too-heavy explosion.

What I claim as my invention, and desire to protect by Letters Patent, is—

1. An apparatus for igniting slow-matches composed of a powder-chamber, channels communicating therewith, slides for closing said channels, and means for igniting the powder in the chamber, substantially as specified.

2. An apparatus for igniting slow-matches composed of a powder-chamber, a pair of cocks, an intervening powder-space, channels communicating with the powder-chamber, and means for igniting the powder in said chamber, substantially as specified.

3. An apparatus for igniting slow-matches composed of a powder-chamber, channels communicating therewith, a trap also communicating with the powder-chamber, and a match-exploding hammer in said trap, substantially as specified.

4. An apparatus for igniting slow-matches composed of a powder-chamber, channels communicating therewith, means for igniting the powder in said chamber, and a notched cutter adapted to sever and cap the slow-match, substantially as specified.

Signed by me at Dusseldorf, Germany, this 5th day of September, 1902.

JACOB VON DER BOSCH.

Witnesses:

WILLIAM EISSENWEIN.

PETER LIEBER.