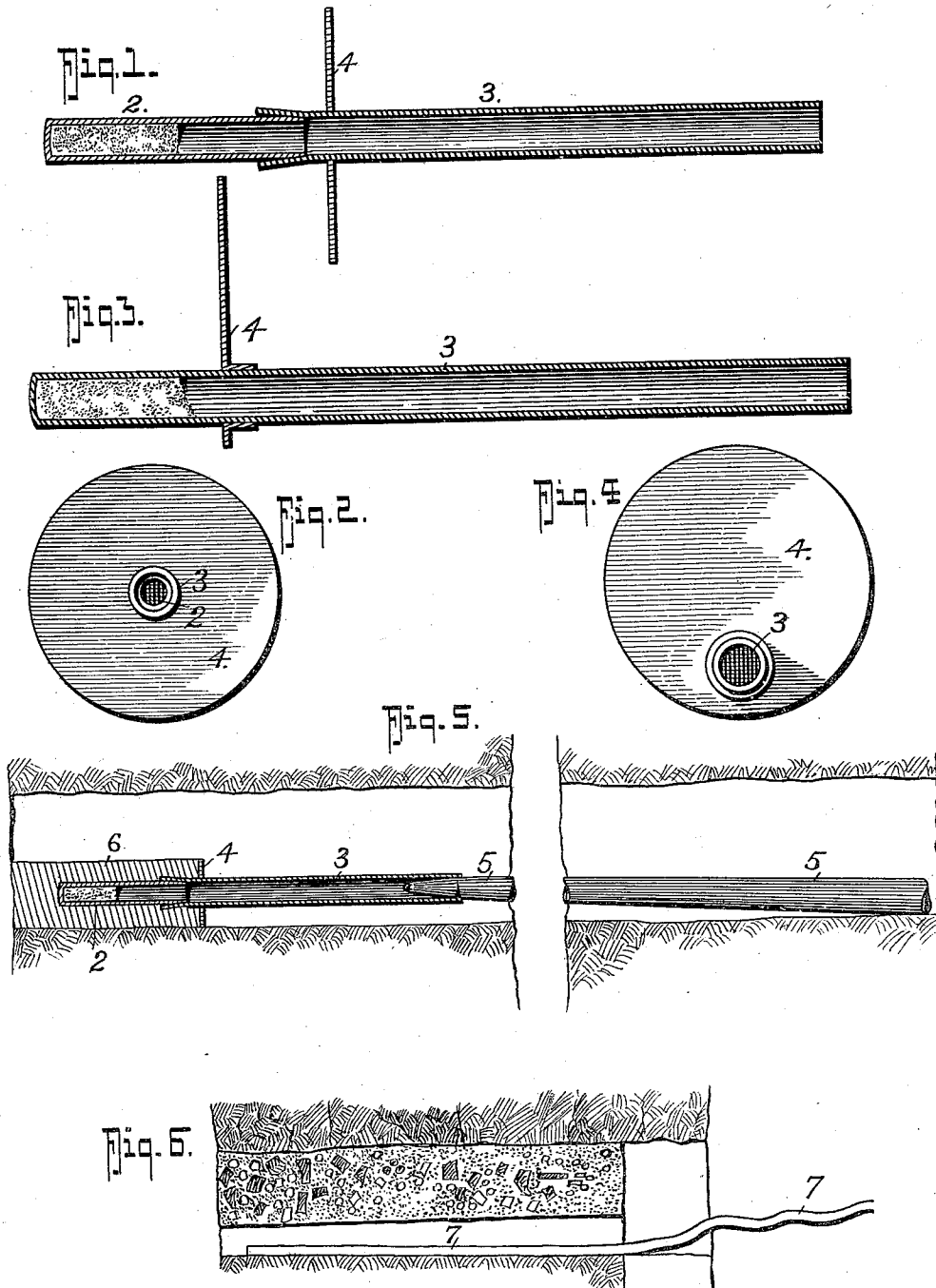


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 MEANS FOR FIRING A BLASTING CHARGE.
 APPLICATION FILED OCT. 16, 1909.

953,594.

Patented Mar. 29, 1910.



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UNITED STATES PATENT OFFICE.

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MEANS FOR FIRING A BLASTING CHARGE.

953,594.

Specification of Letters Patent.

Patented Mar. 29, 1910.

Application filed October 16, 1909. Serial No. 523,073.

To all whom it may concern:

Be it known that I, JAMES CARTWRIGHT, a citizen of the Dominion of Canada, residing at East Wellington, Vancouver Island, in the Province of British Columbia, Canada, have invented a new and useful Means for Firing a Blasting Charge, of which the following is a specification.

This invention relates to an improved means for firing a blasting charge of dynamite or the like by the use of a detonator and squib instead of by means of a fuse or by electricity as at present practiced.

The use of a fuse not only fills the workings with a heavy smoke but is dangerous in that it may smolder and hang fire for a long time with uncertainty on the part of the firer as to whether it is still alive or has gone out, an uncertainty that has resulted in numerous fatal accidents. Although the use of electricity is free from these objections it is both tedious and troublesome to work with and on this account is not popular with either miner or operator.

The squib is commonly used by miners to fire a black powder charge where a detonator is not required but is dangerous for use with dynamite or giant powder on account of the risk in tamping the blast hole adjacent to the detonator sufficiently firm to insure a satisfactory passage being left on the withdrawal of the needle rod for the squib fire to reach the detonator. This objection I have overcome in the invention which is the subject of this application by lengthening the detonator so as to carry its open end in which the needle rod is inserted to a sufficient distance from the detonating end or from the cartridge, to render firm tamping sufficiently safe, and by the provision of a flange on the detonator adjacent to the end which is inserted in the cartridge so that it will shoulder against the same and support its attachment thereto.

The invention is particularly described in the following specification, reference being made to the drawings by which it is accompanied, in which:

Figures 1 and 2 represent in longitudinal section and end view respectively the application of my invention to a detonator of the dimensions at present used. Figs. 3 and 4, similar views of a modification in which the invention is embodied in a specially constructed detonator, and showing also the ec-

centric application of the flange. Fig. 5 shows a longitudinal section of a blast hole with the cartridge and detonator in place and the needle rod in position ready for tamping the hole and Fig. 6 shows the mouth of the tamped shot hole with the needle withdrawn and the firing squib inserted in the passage left thereby.

In these drawings 2 represents an ordinary detonating cap the length of which it is a requirement of my invention should be increased. In Fig. 1 this increase of length is attained by the addition to the cap of a tube 3 socketed onto or into its open end. On this detonator extension 3 a flange 4 is provided which may be integral with, secured to, or slidably adjustable on the extension tube, which flange is designed to bear against the end of the cartridge when the detonator is inserted therein and supports the detonator against the end of the cartridge when the needle rod 5 is inserted in its end. This needle rod 5 preserves a passage through the tamping for the squib flame to pass to explode the charge, being withdrawn when the tamping is complete.

Fig. 3 shows a detonator the body of which is in itself lengthened the required distance to effect the desired object and on it the flange 4 is shown as slidably adjustable so that it may be moved along the tube to any desired position.

In Figs. 3 and 4 the flange 4 is shown as eccentric with the detonator tube the object of which is to enable the needle to lie on the bottom of or to the side of the shot hole and afford more room for the tamper without the risk of dislodging the attachment of the detonator in the cartridge. Where the flange in concentric with the detonator this object may be attained by bending the needle rod toward the smaller end.

In use the detonator 2 with its extension 3 is inserted in the end of the cartridge 6 and is tied thereto in the usual manner, the flange 4 bearing against the end of the cartridge. The end of the tapered needle rod 5 is then inserted in the open end of the detonator or its tubular extension in which insertion it is checked by the quicker taper of the extreme end of 5, and the drill hole is tamped. The distance of the open end of the cap or its extension tube in which the needle rod is inserted from the end in the cartridge, is such as will enable that tamping to be sufficiently firmly done to permit

of the withdrawal of the needle rod without the risk of loose material falling into and obstructing the passage. This firm tamping which is necessary to the successful use of the squib is dangerous if conducted in the immediate proximity of the cartridge and for this reason the end of the detonator is lengthened a sufficient distance to render the operation safe and the lengthened detonator is supported and the end of the cartridge shielded by the flange 4. After withdrawal of the needle rod a squib 7 is inserted in the entrance of the passage left by it toward the mouth of the shot hole and its sulfured tip ignited, the interval of time before the squib fires the shot being determined by the length of the sulfured tip left on the squib. The flame from the squib passes along the hole left by the needle rod and ignites the detonator to fire the charge.

The smoke from a squib is trifling in comparison to what is given off from a length of burning fuse, but what is of infinitely greater importance is that if for any reason the squib may fail to ignite the charge the shot hole may be approached at once without risk as the firing means does not as in the case of a fuse involve the presence of a material smoldering out of sight and adjacent to the detonator.

I am aware that prior to my invention black powder charges have been fired by squibs but this has not been done with any blasting charge that requires the use of a

detonator on account of the danger as before explained of firmly tamping the hole in immediate proximity to the cartridge which the use of a detonator of ordinary length would necessitate. I believe that I have been the first to find a means whereby this objection to the firing of a charge by a detonator and a squib may be overcome and enable the operation of tamping under such circumstances to be safely performed.

I, therefore, claim as my invention and desire to be protected in it by Letters Patent:

1. As a means for firing a blasting charge, the combination with a detonating cap of a lengthening tube removably socketed there- to said tube having a flange projecting from it adjacent to the end to which the detonating cap is socketed.

2. As a means for firing a blasting charge, a detonating cap, and a lengthening tube therefor, said lengthening tube being of the same diameter throughout its length, a flange having an aperture to receive said lengthening tube, and be slidable thereon, substantially as shown and described.

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

JAMES CARTWRIGHT.

Witnesses:

ROWLAND BRITAIN,
ALEXANDER SMITH.