E. & S. PURCELL.

CARTRIDGE FOR MINING PURPOSES.

APPLICATION FILED MAR. 30, 1908.

910,722. Patented Jan. 26, 1909.

FIG. 1

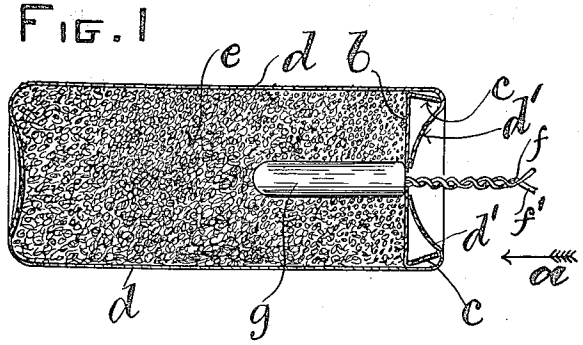


FIG. 2

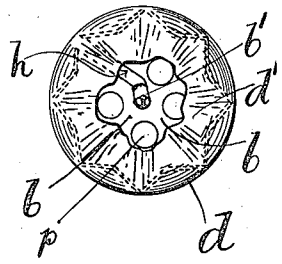


FIG. 3

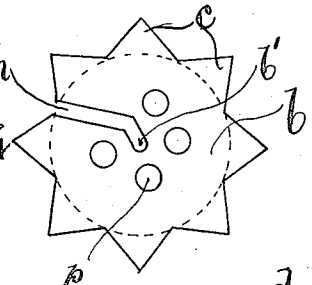


FIG. 4

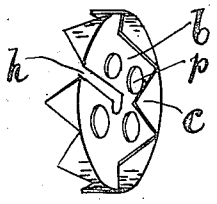


FIG. 7

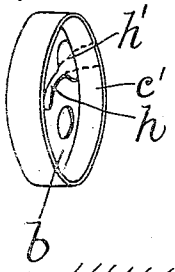


FIG. 5

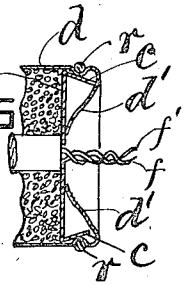
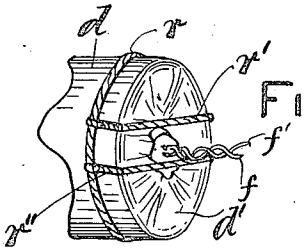


FIG. 6



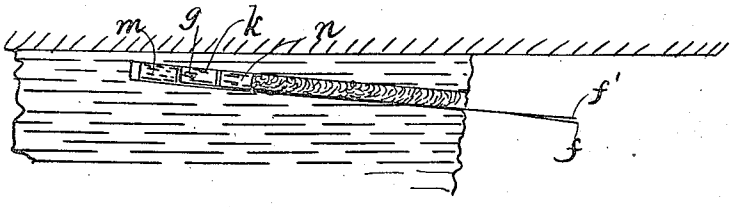


FIG. 9

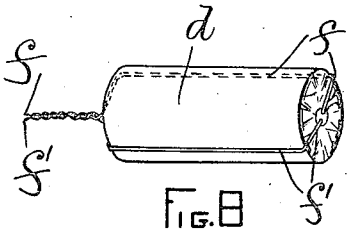


FIG. 8

Witnesses:-

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UNITED STATES PATENT OFFICE.

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CARTRIDGE FOR MINING PURPOSES.

No. 910,722. Specification of Letters Patent. Patented Jan. 26, 1909.

Application filed March 30, 1908. Serial No. 424,022.

To all whom it may concern:

Be it known that we, EDWARD PURCELL and SAMUEL PURCELL, subjects of the King of Great Britain, and residing at Linden Terrace and The Mount, respectively, both in Pontefract, in the county of York, England, have invented certain new and useful Improvements in Cartridges for Mining Purposes, of which the following description, having reference to the accompanying sheet of drawings, is a specification.

In the employment of cartridges for mining or like purposes such as for the breaking down of coal, blasting of rock etc., it has been found desirable to dispense with the employment of metal as forming any part of such cartridges. This is done, not only as a precaution against accidental sparking that might cause premature ignition of the explosive, but also for purposes of economy, hence cardboard or paper receptacles are extensively made use of. On placing cartridges thus constructed, within the holes drilled to receive them considerable difficulty is encountered in securing or attaching the cap or detonator (usually composed of fulminate of mercury) to the primer or that cartridge which has to be ignited and which has to ignite the other cartridges within such hole, on account of the cardboard or paper casing not being sufficiently rigid to retain same in its proper position. To obviate this disadvantage or defect by the employment of devices which are of comparatively little cost of production and which will act efficiently is the object of our present invention. This object we attain by the devices illustrated in the accompanying sheet of drawings wherein:—

Figure 1 is a longitudinal section of a cartridge with the detonator held in position therein by the devices hereinafter explained. Fig. 2 is an end elevation of a cartridge seen in the direction indicated by the arrow *a* of Fig. 1. Figs. 3 and 4 are plan and perspective views respectively of our improved device. Figs. 5 and 6 are sectional and perspective views of the end of a cartridge showing a modified form of applying our improved parts thereto. Fig. 7 is a perspective view showing a modification hereinafter explained. Fig. 8 is also a perspective view (drawn to a reduced scale) showing the arrangement of certain of the parts hereinafter described. Fig. 9 is a sectional elevation (drawn to a reduced scale) showing how cartridges are made use of.

Similar figures and letters of reference indicate similar parts in all the views.

In carrying our invention into effect we make use of disks of cardboard, stout paper or other suitable material *b* cut so that radiating projections *c* will extend from their edges in order that they may be bent to an angle thereto, as shown by Figs. 1, 4 and 5, on or before being inserted within the casing *d* which with the explosive substances *e* within forms the cartridge. These disks *b* when thus prepared are for insertion within the casing so that the projections *c* therefrom will extend in a direction leading out of the casing *d* as shown by Figs. 1 and 5, in order that when the outer end *d'* of said casing *d* is turned over to envelop or enfold said disks *b*, the projecting parts therefrom will be firmly overlapped and locked within, therefore their withdrawal is prevented. In cases where the slight extra expense of providing a flange (as the flange *c'* Fig. 7) instead of the projections *c* does not interfere with the use of the disks *b* then such may be formed as shown by having an enlarged opening *h'* for the insertion of the detonator *g* so that its wires *f*, *f'* may enter the slot *h*, or the slot *h* may extend to the outer edge of the disk *b* as above described. Or a simple plain disk *b* without projections *c* or flanges *c'* might be made use of. Within each of these disks *b* a central opening *b'* is made so that the wires *f*, *f'* (which conduct the electric current to, so as to ignite the cap or detonator *g*) may pass therethrough, and to enable such wires *f*, *f'* to be more easily placed within such opening a slot *h* is made laterally therefrom to extend out of the edge of the disk *b* so that same may be made to take over the wires and be slid into position. The slot *h* may either be of the form shown or it may lead in a curved or straight course from the opening *b'* to the edge of the disk *b*.

As it is thought desirable that the explosive gases given off by the "primer" cartridge (as *k* Fig. 9) which is the cartridge fired by the detonator should have as free a course as possible to enable it to act upon the contents of the cartridges *m*, *n* (Fig. 9) adjoining; we make openings or perforations *p* through the fixing disks *b* above described so that said gases may have clear passages therethrough.

When it is found that the disks *b* require still further locking in position, then we may have a groove formed in the outer surface of the casing *d* to receive a piece of string *r*. This string *r* we firmly tie or fix within this groove and leave two extensions *r'*, *r''* of it to reach across the end of the cartridge as shown by Fig. 6 (or they may be made long enough to extend also around the other end of the casing *d*) so as to retain the turned-in ends *d'* of the casing *d* in position. The cap or detonator *g* is inserted within the casing *d* by passing it between the strings *r'*, *r''* and in some cases it may be found sufficient to use the string attachments *r*, *r'*, *r''* without making use of the disk *b*, while in other cases the disk alone may be sufficient.

As means for securing in position the disk *b* of any of the forms hereinbefore described, the wires *f*, *f'* may be bent or turned over the edges of the casing *d* and carried to the other end of same, as shown by Fig. 8, in which position they are twisted together to cause them to slightly grip said casing *d*.

Such being the nature and object of our said invention what we claim is:—

1. An explosive cartridge of the character described, consisting of a casing, a detonator therein and a disk of light flexible fibrous material having an aperture for the passage of the wires of the detonator, and a supporting flange bent at an angle to the disk, the end of the casing being bent over the flange and against the disk.

2. An explosive cartridge of the character described, consisting of a casing, a detonator located therein, a disk of light flexible fibrous material having an aperture for the passage of the wires of the detonator, and a supporting flange bent at an angle to the disk, the ends of the casing being bent over the flange and against the disk, and means for fastening the ends of the casing over the disk.

3. An explosive cartridge of the character described, consisting of a casing, a detonator located therein, and a disk of light flexible fibrous material having a central passage and a radial slot for the passage of the wires of the detonator, and a supporting flange bent at an angle to the disk, the end of the casing being bent over the flange and against the disk.

4. An explosive cartridge of the character described, consisting of a casing, a detonator located therein and a disk of light flexible fibrous material located within said casing, having a central aperture, a radial slot and an opening at its periphery at the end of said slot for the passage of the detonator and its wires, said disk having a supporting flange bent at an angle thereto, the ends of the casing being bent over said flange and against the disk.

5. An explosive cartridge of the character described, consisting of a casing, a detonator located therein and a disk of light flexible fibrous material located within the casing and having a central aperture and radial slot for the passage of the detonator wires, an opening at the end of said slot for the passage of the detonator, openings for the escape of gas, and a supporting flange located in the casing and bent at an angle to the disk, the ends of the casing being bent over the flange and against the disk.

6. In an explosive cartridge of the character described, a disk of light flexible fibrous material formed with a flange consisting of tapering projections, vents for the escape of gas, and a central aperture and radial slot for the passage of the wires of a detonator.

7. An explosive cartridge of the character described, consisting of a casing, a detonator located therein, a disk of light flexible fibrous material located in the end of the casing having a central aperture for the passage of detonator wires, and a supporting flange, the ends of the casing being bent over said flange and against the disk, and a cord extending from and secured to the casing and fastening the inturned end of the casing against the disk.

In testimony whereof we have affixed our signatures in presence of two witnesses.

EDWARD PURCELL.
SAMUEL PURCELL.

Witnesses:
SAMUEL HEY,
JOHN WHITEHEAD.