No. 709,979. Patented Sept. 30, 1902.

J. H. GARSON.

FUSE IGNITING TAPE.

(Application filed Nov. 11, 1901.)

(No Model.)

Fig. 1.

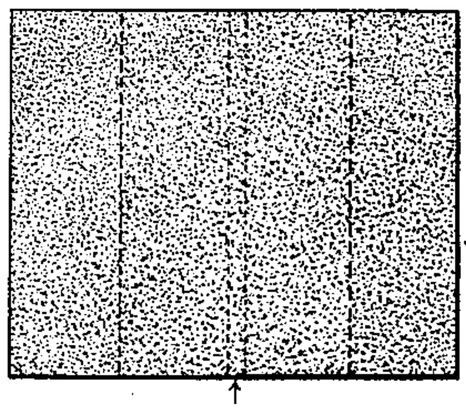


Fig. 2.

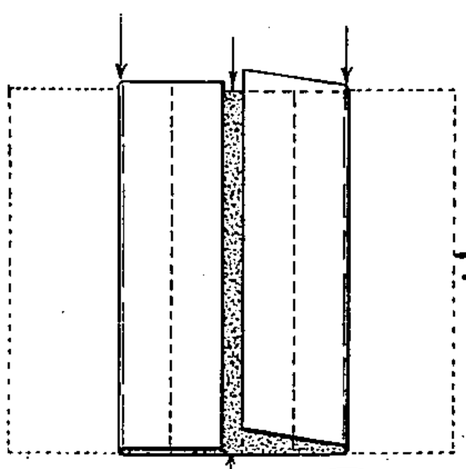


Fig. 3.

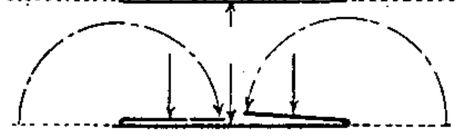


Fig. 4.

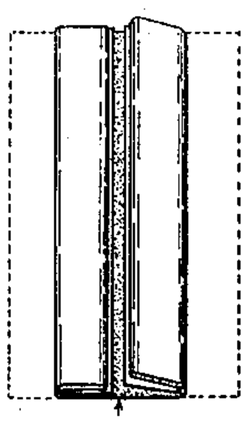


Fig. 5.

Fig. 6.

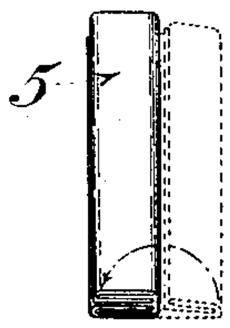


Fig. 7.

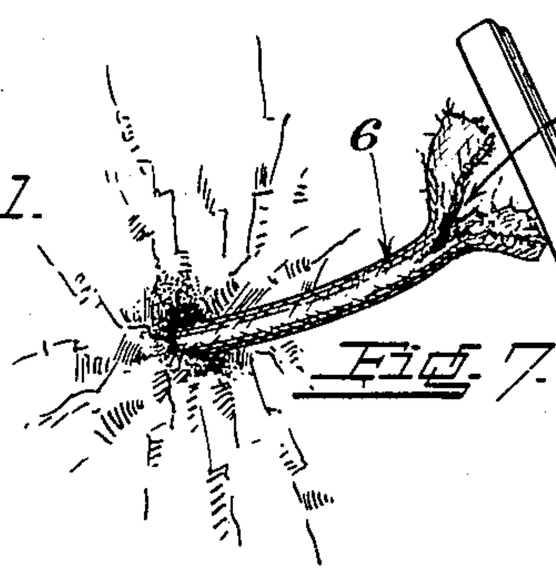


Fig. 8.

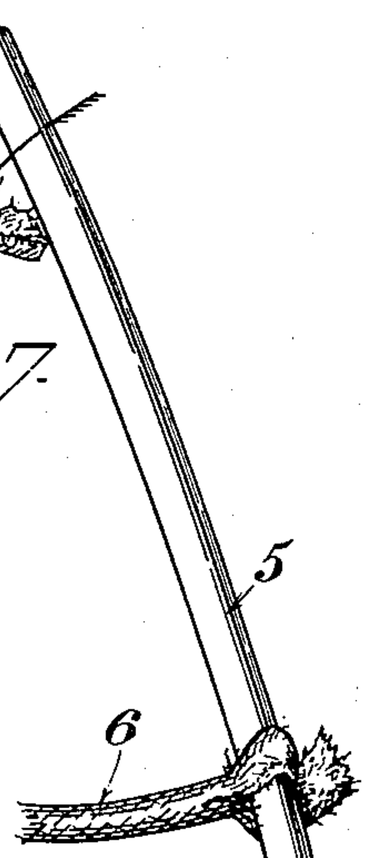


Fig. 9.

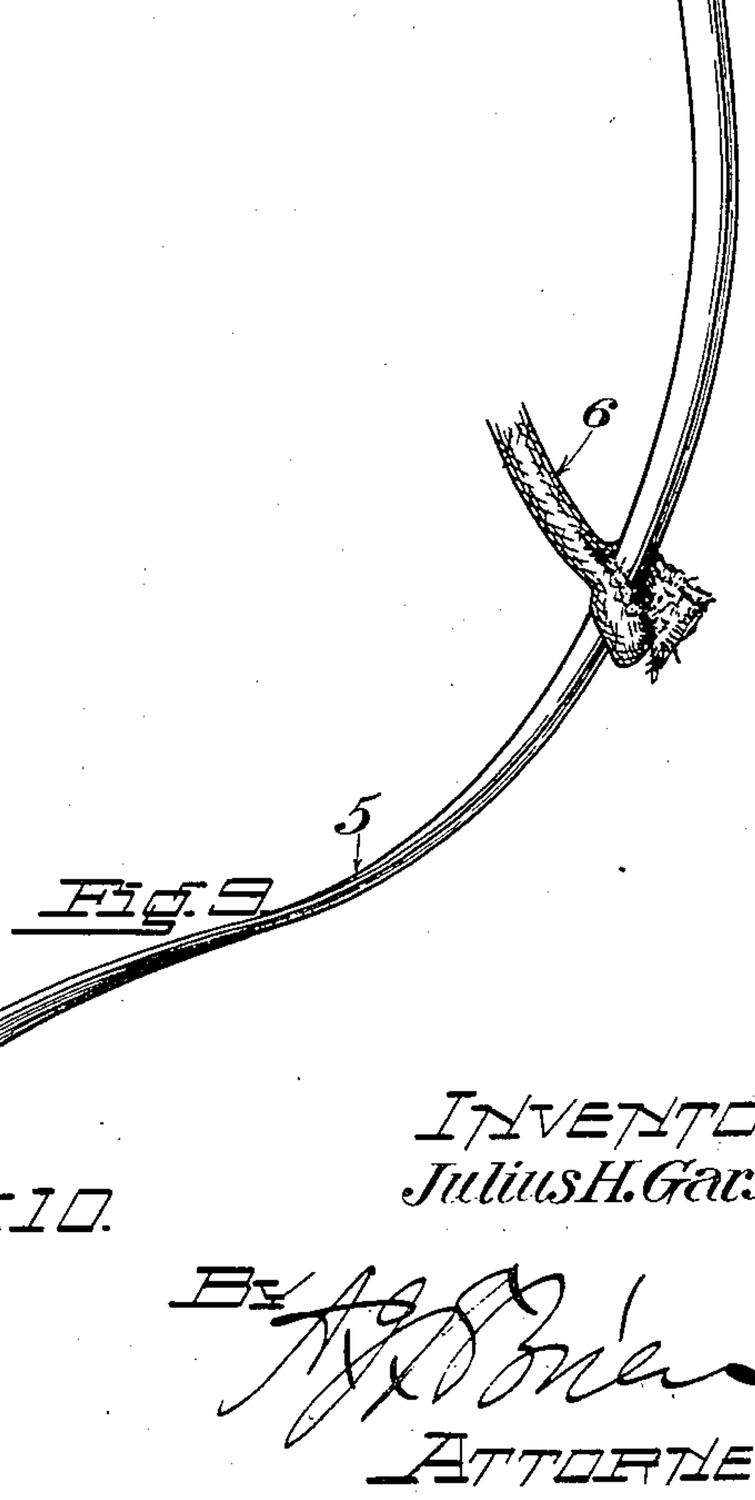
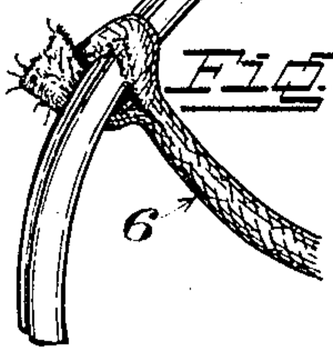


Fig. 10.



WITNESSES:

D. T. Foreman

L. M. Steff

INVENTOR,
Julius H. Garson.

By A. D. Brien

ATTORNEY.

UNITED STATES PATENT OFFICE.

JULIUS H. GARSON, OF DENVER, COLORADO, ASSIGNOR OF ONE-HALF TO DAVID H. FOREMAN AND WILLIAM C. BAUM, OF DENVER, COLORADO.

FUSE-IGNITING TAPE.

SPECIFICATION forming part of Letters Patent No. 709,979, dated September 30, 1902.

Application filed November 11, 1901. Serial No. 82,071. (No model.)

To all whom it may concern:

Be it known that I, JULIUS H. GARSON, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Fuse-Igniting Tapes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in means for igniting blasting-fuses, my main object being to provide a device which may be readily connected with a number of fuses, whereby all of the latter may be ignited practically simultaneously by lighting the igniting device at a single point, thus allowing the person in charge of the blasting to get out of danger before an explosion occurs, as more fully hereinafter explained.

The invention will now be explained in detail, reference being had to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 illustrates a portion of the paper ribbon or other suitable material used in making the tape, the same being coated upon one side with an inflammable substance or compound. This view also shows in dotted lines the position of the first longitudinal folding-lines and the central longitudinal igniting-line. Fig. 2 illustrates the first-fold position. Fig. 3 is an end view of the same. Fig. 4 illustrates the second-fold position. Fig. 5 is an end view of the same. Figs. 4 and 5 show clearly the longitudinal central line of exploding and igniting, being of the initial single thickness of the ribbon material. Fig. 6 illustrates the closing-fold forming the fuse-igniting tape with a single thickness extending longitudinally, with the exploding and igniting lines disposed upon the edges. Fig. 7 illustrates the ordinary blasting-fuse split longitudinally upon the lighting end preparatory to attaching the igniting-tape. Fig. 8 illustrates the manner of attaching the tape to the fuse, with the exploding and igniting edge placed adjacent the powder core of the fuse. Figs. 8, 9, and 10 also illustrate the manner of applying the tape right or left in igniting a battery of blasting-fuses with a single continuous tape.

Let the numeral 5 designate the completed tape formed by folding the blank shown in Fig. 1 inwardly from its opposite edges, which operation is clearly illustrated in Figs. 1 to 6, inclusive. The strip of material employed in making the tape is first prepared by coating its inner surface with a highly or readily inflammable substance or compound or an explosive substance or compound, as may be desired.

I do not limit the invention to the use of any special material nor to the use of any special substance or compound, the only essential requisite being that the material or substance be of such character as to perform the function stated. The exterior surface of the material employed should be provided with a waterproof coating or so treated as to render it impervious to water when the tape is ready for use.

The material of which the tape is composed is so folded that only a thin or fragile layer of material longitudinally disposed covers the inflammable or explosive substance of the tape. In use this delicate or fragile portion of the tape is preferably placed next to the igniting-core of the fuse, whereby the fire runs the entire length of the tape, igniting all the fuses in its path.

When the folding of the tape is completed, it is fastened in the folded position in any suitable manner, as by applying some adhesive paste or substance. The ribbon or strip of which the tape is composed is rendered waterproof exteriorly by coating or otherwise in order to thoroughly protect the inflammable or explosive coating of its inner surface, as aforesaid.

By folding the tape with a succession of longitudinal inward folds, as shown in Figs. 1 to 5, inclusive, the flat sides are reinforced by the several thicknesses of the material used. In finally folding these reinforced sides over together, as shown in Fig. 6, and fixing them by coating the meeting sides with a suitable adhesive substance a tape is produced having a relatively weaker fragile line of the initial single thickness of the ribbon

material longitudinally disposed upon the folding edge and also a relatively weaker line of contact upon the opposite or creased meeting edges of the final fold. In applying the igniting-tape the fragile folding edge is preferably placed next the powder core of the split blasting-fuse. This is not essential, however, as contact with the opposite creased edge serves a like purpose.

The plurality of foldings upon the sides of the tape afford a maximum area of inflammable material, insuring thorough combustion, and the spaces between form flues or longitudinally-disposed passages for the gases and flames of combustion. Therefore when the tape is ignited at either more convenient end the fire runs its entire length with great rapidity, the explosive gases fracture the relatively weaker edges and forcibly eject the flames of ignition outwardly therefrom, driving them into contact with the "live" powder core of the split blasting-fuses, and insures thereby to a maximum degree of certainty the ignition of all fuses to which the tape may be attached.

From the foregoing description and the above reference to the figures of the drawings the construction, application, and utility of my invention will be readily comprehended.

In mining practice it is well known that miners ordinarily ignite a battery of several blasts, as shown in Figs. 7, 8, 9, and 10, by use of the miner's candle, each fuse being cut to a predetermined length, securing thereby the protection necessary for the time required in lighting each of the several fuses in succession. Owing to the fact that it is not unusual for the explosive puff from the first or one of the other fuses to extinguish the candle in the act of igniting, miners usually provide themselves with one or more extra lighting-candles, thus enabling them to ignite all the fuses safely within the predetermined period of time. Notwithstanding the taking of this precaution, miners have frequently been caught through some unexpected interruption occurring, as above noted, during the nicely "timed" period of igniting the blasts with disastrous or fatal results to themselves. By the use of my fuse-igniting tape applied to a battery of fuses, as shown in Figs. 7, 8, 9, and 10, no such accident can occur, since the fuses in the first place are all so cut that they are of the proper relative lengths, and, second, that the tape when applied requires but one point of ignition—namely, at either more convenient end—and, furthermore, the explosive puff from the several fuses cannot under any conditions extinguish the igniting-tape. Consequently blasts can be set off in succession with positive accuracy and with the desired safety to the miner.

Having thus described my invention, what I claim is—

1. As an improved article of manufacture, an igniting device composed of a strip of material folded to form a flat tape, said device having a fragile igniting-line whereby perfect contact of the same with the powder core, may be effected by inserting the flat igniting-tape in the split end of the blasting-fuse.

2. As an improved article of manufacture, a fuse-igniting tape, composed of a ribbon of suitable material, coated with a readily-inflammable substance, and folded longitudinally and fastened in the folded position, substantially as described.

3. As an improved article of manufacture, a fuse-igniting tape, composed of a ribbon or strip of suitable material coated upon one side with a suitable readily-inflammable compound, folded inwardly from the edges by a succession of longitudinal folds and fixed in the folded position, forming an igniting-tape having a fragile igniting-line longitudinally disposed thereon.

4. As an improved article of manufacture, a fuse-igniting tape, composed of a ribbon of suitable material coated with an explosive substance or compound, and folded longitudinally, and suitably fixed, forming an inflammable tape the same being coated to render the fabric impervious to water.

5. A fuse-igniting tape, composed of a strip of material coated with an explosive substance, and folded to form a fragile-fuse-igniting line, longitudinally disposed for the purpose set forth.

6. A fuse-igniting tape constructed of suitable material and of a length to be attached to a plurality of blasting-fuses, whereby all of the fuses may be lighted from a single ignition of the tape, the said tape being formed from a strip of suitable material coated with an inflammable substance and folded.

7. A fuse-igniting tape having a fragile, readily-inflammable igniting-line, longitudinally disposed thereon for the purpose set forth.

8. A fuse-igniting tape formed from a strip of material coated on its inner surface with an inflammable or explosive substance, and its exterior surface with a substance adapted to prevent injury from moisture, the said strip being folded, substantially as described and for the purpose set forth.

9. A fuse-igniting tape composed of a strip of suitable material coated with an inflammable substance and folded to form a number of loose layers permitting circulation of air to facilitate the travel of the fire, substantially as described.

10. A flat, inflammable, fuse-igniting tape having fragile igniting-lines disposed upon the edges thereof, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JULIUS H. GARSON.

Witnesses:
HARRY M. NEFF,
DAVID H. FOREMAN.