

THE MILLER WATERPROOF MINING

CAP PROTECTORS

by Mark Bohannon
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Even after years of collecting mining artifacts--both underground and through antique shops and shows--it's amazing the number of never-before-heard-of items that still surface. One such item is the Miller Waterproof Mining Cap Protector invented by William Elias Miller in 1899.

The Miller Waterproof Mining Cap Protector was designed to provide a quick and easy waterproof seal between the connection of the blasting cap and safety fuse.

On November 14, 1899, William Miller patented "a new and useful Device for Applying Protectors to the Fulminating-Caps of Explosive Charges." The device for applying the protectors to blasting caps consisted of a staff consisting "of a piece of wood, metal, or any other appropriate material, and it may be either solid or hollow. I prefer to employ a cylindrical stick of wood to constitute the staff, and the staff is of a diameter slightly less than the interior diameter of the fulminating-cap at one end."

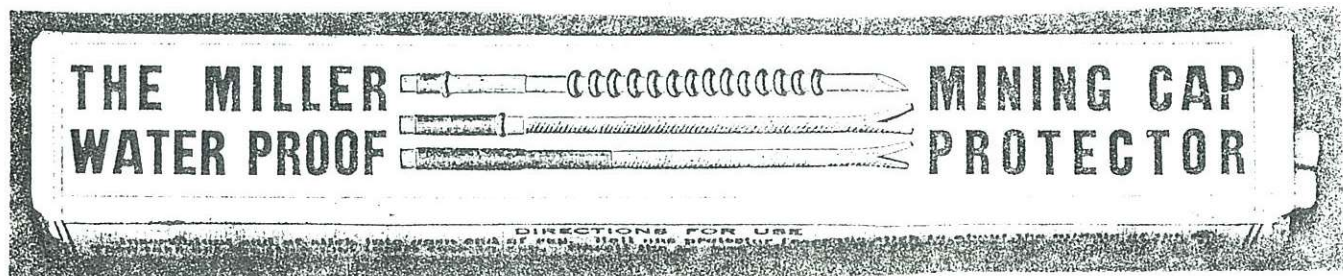


Figure 1. The Miller Waterproof Mining Cap Protectors shown here were packed in a white cardboard box 6 1/2 inches long by 1 inch square and printed in black. The wooden holders are also six and a half inches long and contain twenty-five protectors per holder. The box held four holders for a total of one hundred protectors per box.

Because of the fact that the cap protector holders shown here all have a shoulder at one end of the stick, it is most likely that these protectors were manufactured sometime after 1942--the year John Curtiss applied for a patent with this feature.

The device also consisted of "a series of rolled tubular protectors rolled upon said staff and adapted to be removed successively and individually therefrom by rolling them in their rolled condition from the staff to a cap."

Each protector was a single tube of elastic rubber that was of the proper diameter to fit over the blasting cap and safety fuse.

Because of the elastic nature of the protectors, some difficulty was initially experienced in slipping them over the blasting caps and safety fuses. To overcome this difficulty, Miller coiled each cap protector upon itself and then arranged the protectors onto the staff in the form of a collar.

In using the Miller Waterproof Mining Cap Protectors, "first transfer one of the collar-like protectors from the staff to the cap. The open end of the cap is brought into juxtaposition to one end of the staff, and the operator then proceeds to transfer one protector from the staff to the cap by rolling the protector over and over the staff until it passes from the staff onto or upon the cap. In this operation of transferring the protector from the staff to the cap said protector retains its rolled-up condition, so that it at once fits on the cap in the form of a collar, and the cap, with the protector thereon, is now detached from the staff. The next step in the operation is the assemblage of the fuse with relation to the open end of the cap, and finally the protector is uncoiled by turning the same in the opposite direction from the direction in which it was manipulated to transfer the protector in its collar-like condition from the staff to the cap. In unrolling or uncoiling the protector from the cap to the fuse a part of the protector adheres to and closely embraces the cap, while the other part of the protector is made to embrace a part of the fuse where it enters the open end of said cap. This protector is thus adapted to closely embrace the cap and fuse, so as to cover the joint between the elements for protecting the fulminate against the admission of moisture at the joint between the fuse and cap. It will be seen that I have provided a device adapted to carry a number of elastic protectors which may be easily and quickly transferred to the cap and the fuse used in connection therewith. The miner may thus be supplied with fresh and elastic protectors, and the staff may be easily carried in the pocket without inconvenience."

On August 17, 1909, Miller patented an improvement to his 1899 patent "to facilitate the rolling of the protector, and their positioning either on the holder or staff, of their transference from the roller or former directly to the caps." This patent mainly encompassed a device for rolling his cap protectors onto the wooden staff more easily.

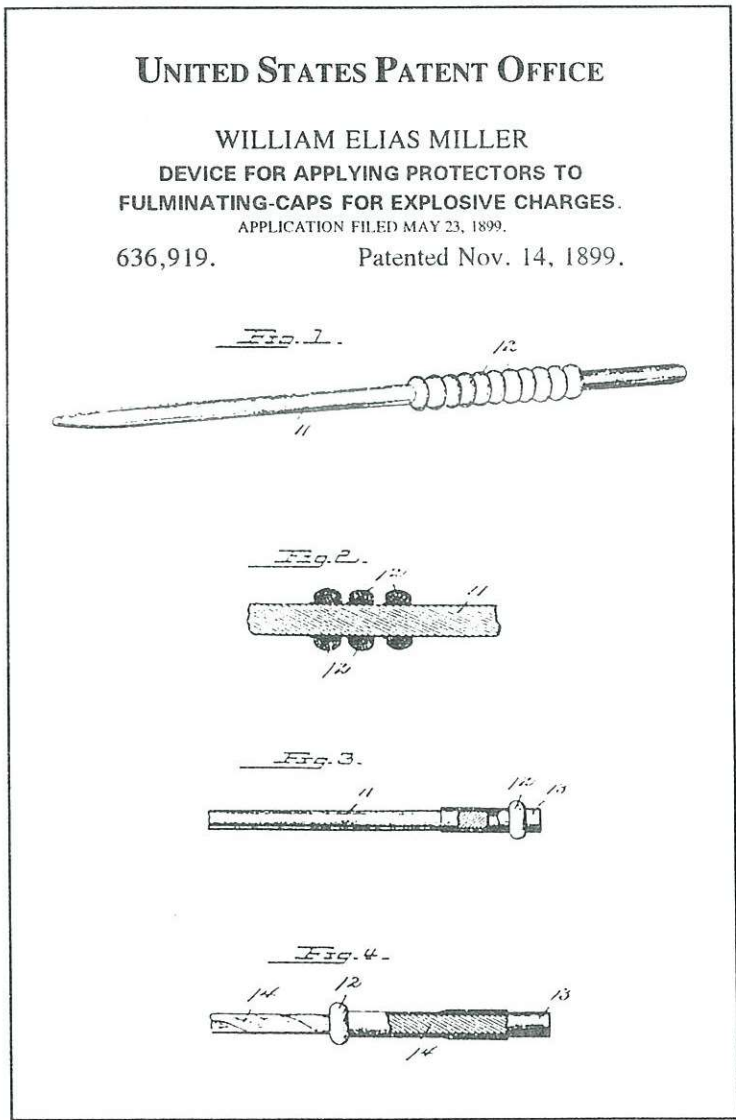


Figure 2. The patent drawings for William Miller's blasting cap protectors patented in 1899.

UNITED STATES PATENT OFFICE

WILLIAM ELIAS MILLER
 DEVICE FOR APPLYING PROTECTORS
 TO FULMINATING-CAPS.
 APPLICATION FILED MAR. 28, 1908.

931,454. Patented Aug. 17, 1909.

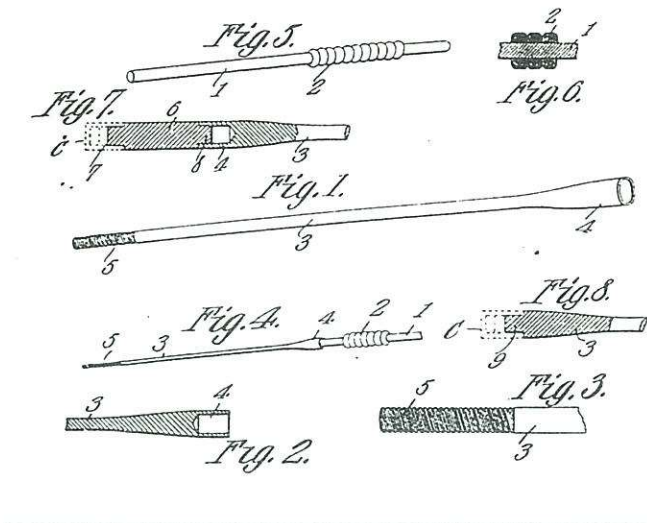


Figure 3. The patent drawings for William Miller's patent that mainly encompassed a device for rolling his cap protectors onto the wooden staff more easily.

On November 6, 1945, John S. Curtiss of El Paso, Texas, was granted two patents that were based on William Miller's 1899 and 1909 patents. Curtiss's first patent--applied for on October 23, 1942--was for a combined cap protector roller (towards the right on the patent drawings) and a cap protector carrier with the protector application end at the left. A major difference between the Miller and Curtiss patents is that in Miller's patent, the application end of his carrier or staff was designed to slip inside the open end of a blasting cap and then the protector was rolled off onto the cap. This could be dangerous because if the staff was inserted into the cap to abruptly, or with too much pressure, or with excessive twisting, a premature detonation of the cap could occur. In Curtiss's patent, this danger was eliminated by the addition of a shoulder towards the end of the loading stick which prevented the stick from

UNITED STATES PATENT OFFICE

JOHN S. CURTISS
 FUSE PROTECTOR DEVICE.
 APPLICATION FILED OCT. 23, 1942.

2,388,309. Patented Nov. 6, 1945.

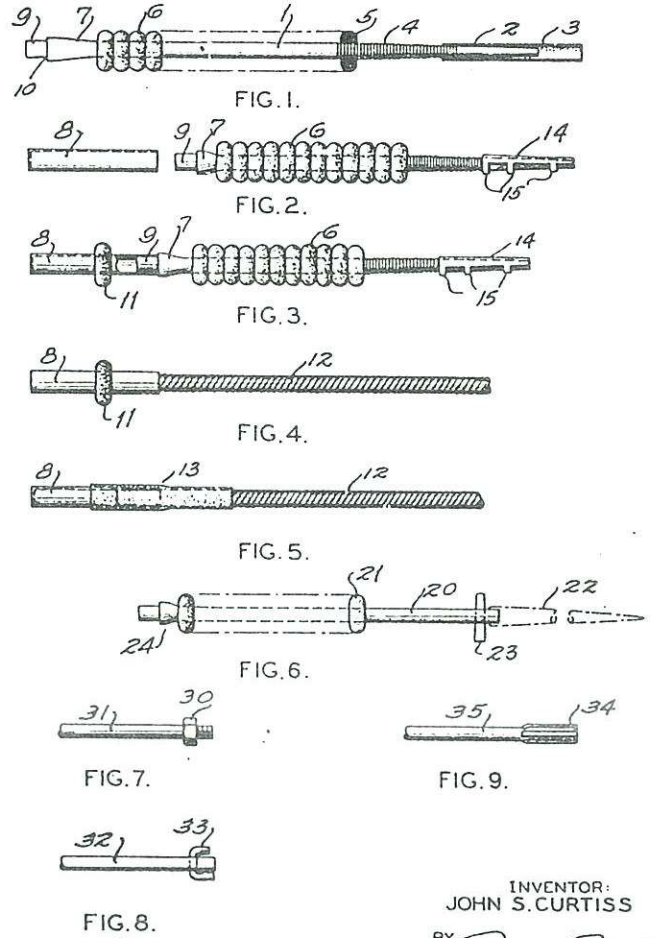


Figure 4. The patent drawings for John Curtiss's 1945 patent that was based on William Miller's 1899 and 1909 patents. In the drawings, Figure 2 shows the stick with its discharge end about to be inserted into a blasting cap and with a safety device applied to its loading end to prevent the insertion of the same into the blasting cap and to guard against the unrolling of the fuse protector over the loading end. Figure 3 shows the stick applied to the blasting cap and one of the protectors rolled onto the cap. Figure 4 shows the blasting cap with the protector stick removed and a length of fuse inserted into the open end of the cap. And Figure 5 shows the protector unrolled into its functioning position.

INVENTOR:
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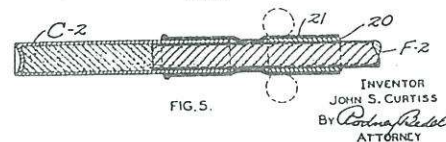
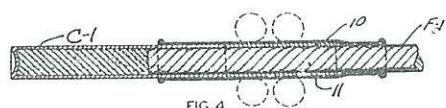
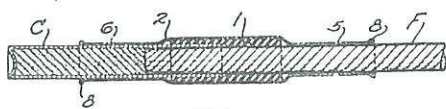
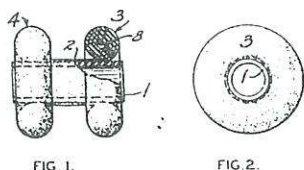
UNITED STATES PATENT OFFICE

JOHN S. CURTISS
BLASTING CAP FUSE PROTECTOR.

APPLICATION FILED SEPT. 1, 1943.

2,388,310.

Patented Nov. 6, 1945.



INVENTOR
JOHN S. CURTISS
By *Colin R. Smith*
ATTORNEY

being inserted into the blasting cap too far.

The second patent granted to Curtiss--applied for on September 1, 1943--was still based on Miller's two patents, but consisted of a "short sleeve and a relatively long tube, the latter being rolled inwardly from each end over and over to form doughnut-like roll portions around the end portions of the sleeve." The sleeve and tube were made of a fairly thick rubber-like material.

When William Miller first invented his waterproof cap protectors in 1899, he was living in Denver, Colorado. Sometime between then and 1908, he moved to Salt Lake City, Utah.

It appears that probably sometime after 1909, William Miller formed The Miller Manufacturing Company to manufacture and distribute his Mining Cap Protectors. Sometime between 1909 and 1942 he moved to El Paso, Texas.

Figure 5. The patent drawings for John Curtiss's other 1945 patent that was based in part on William Miller's 1899 and 1909 patents. This patent consisted of a short sleeve and a longer tube that was rolled inwardly from each end over and over to form doughnut-like roll portions around the end portions of the sleeve.

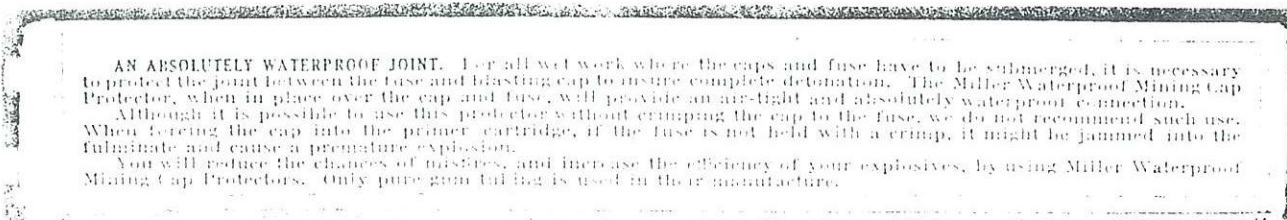
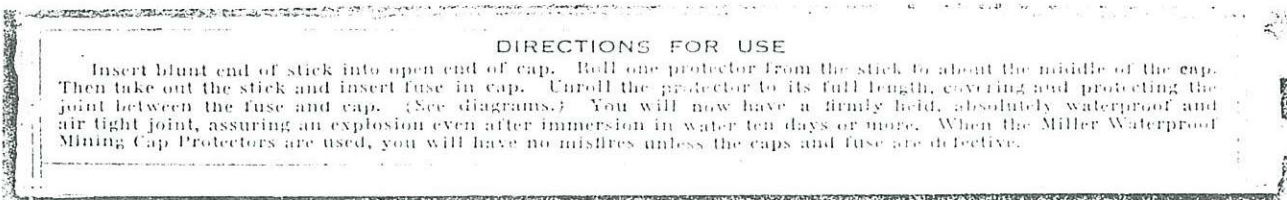
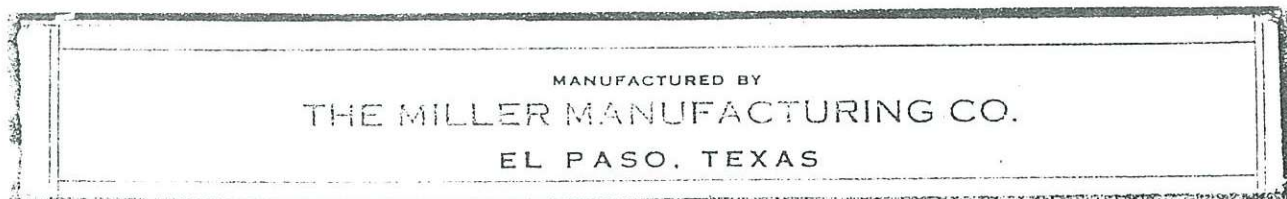


Figure 6. Shown above are the other three sides of the Miller Waterproof Mining Cap Protector box showing the location of the company, instructions and information about the cap protectors.