

T. P. SHAFFNER.  
CARTRIDGE.

No. 51,672.

Patented Dec. 19, 1865.

Fig. 1.

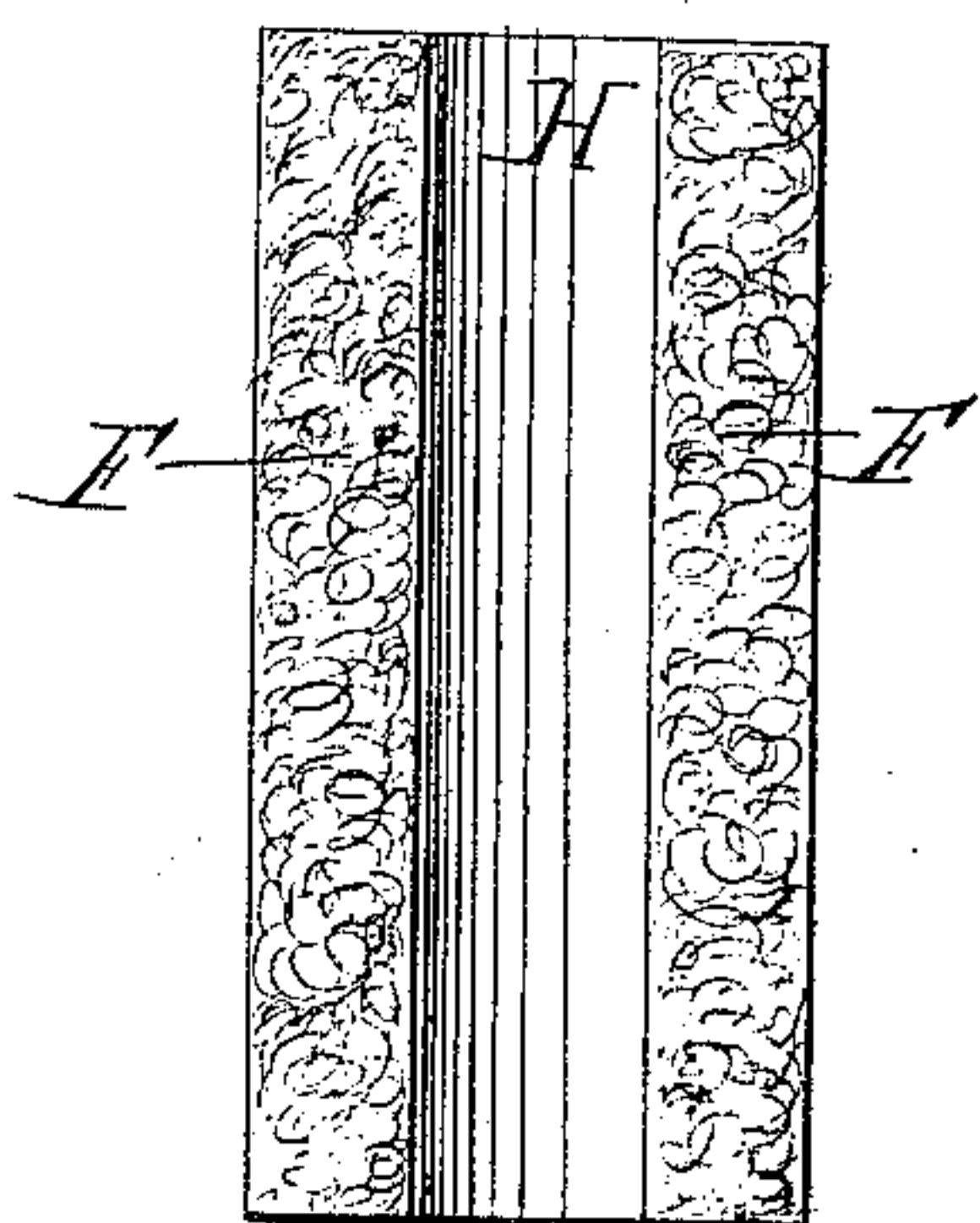


Fig. 2.

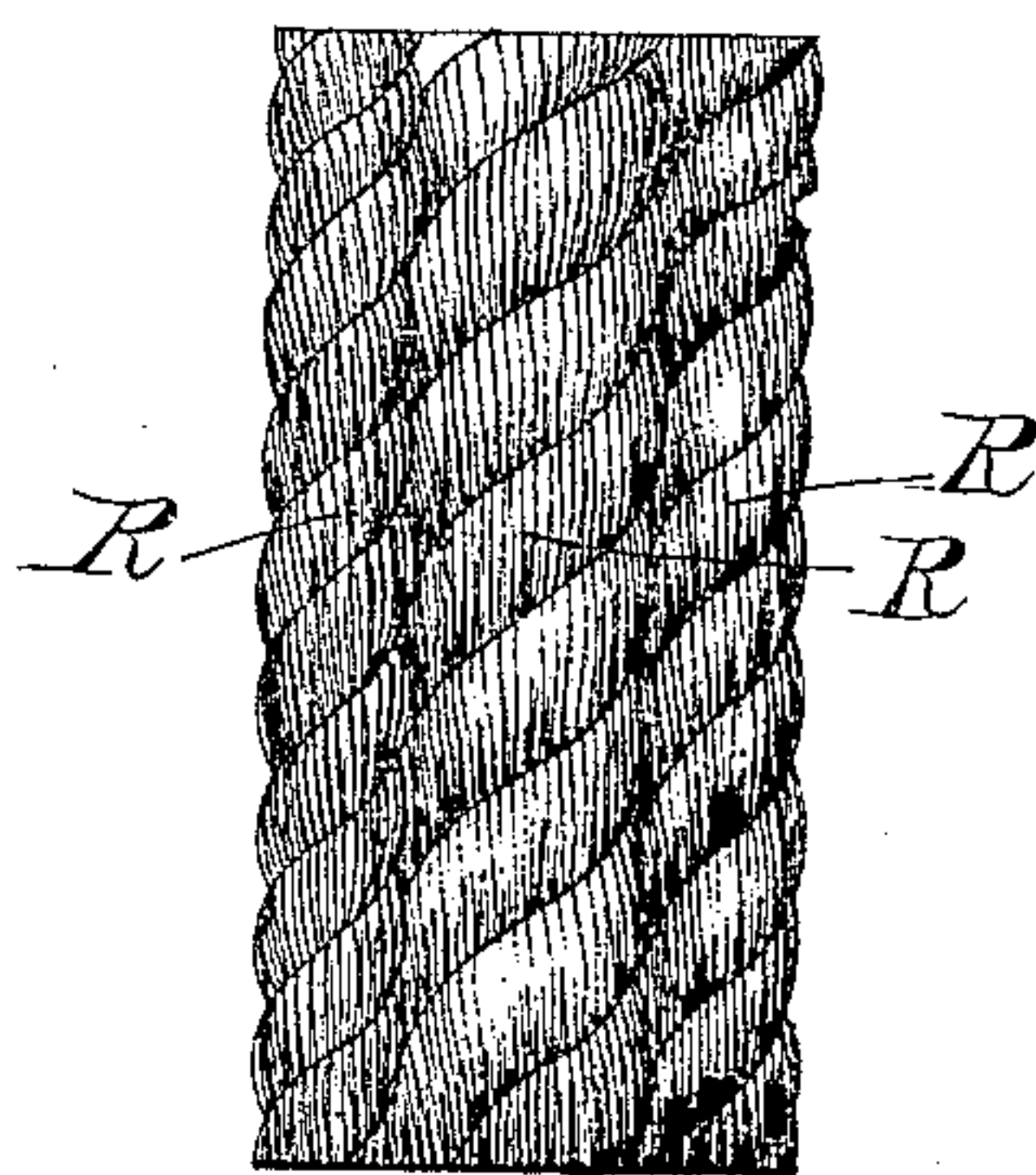


Fig. 3.

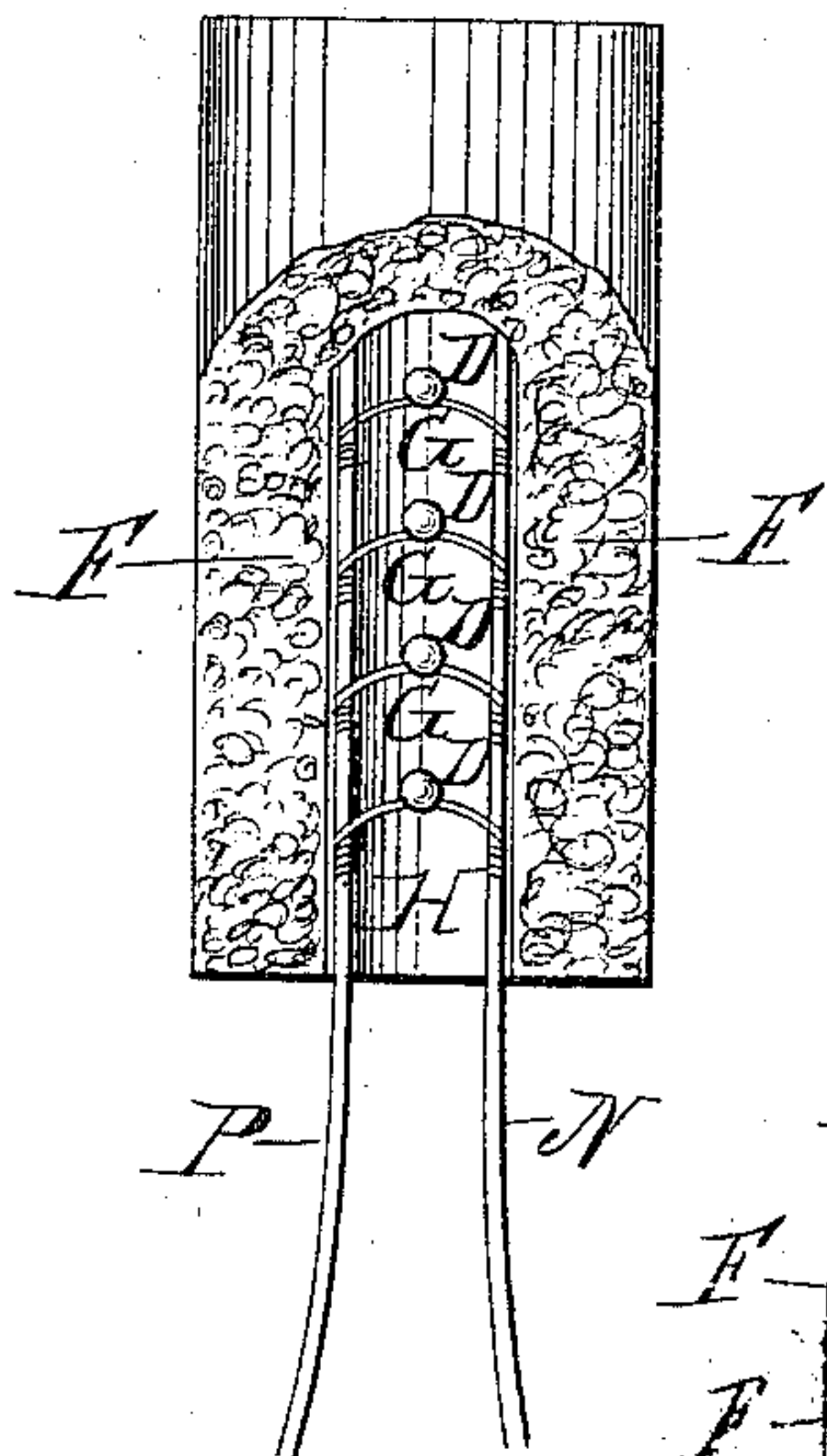


Fig. 4.

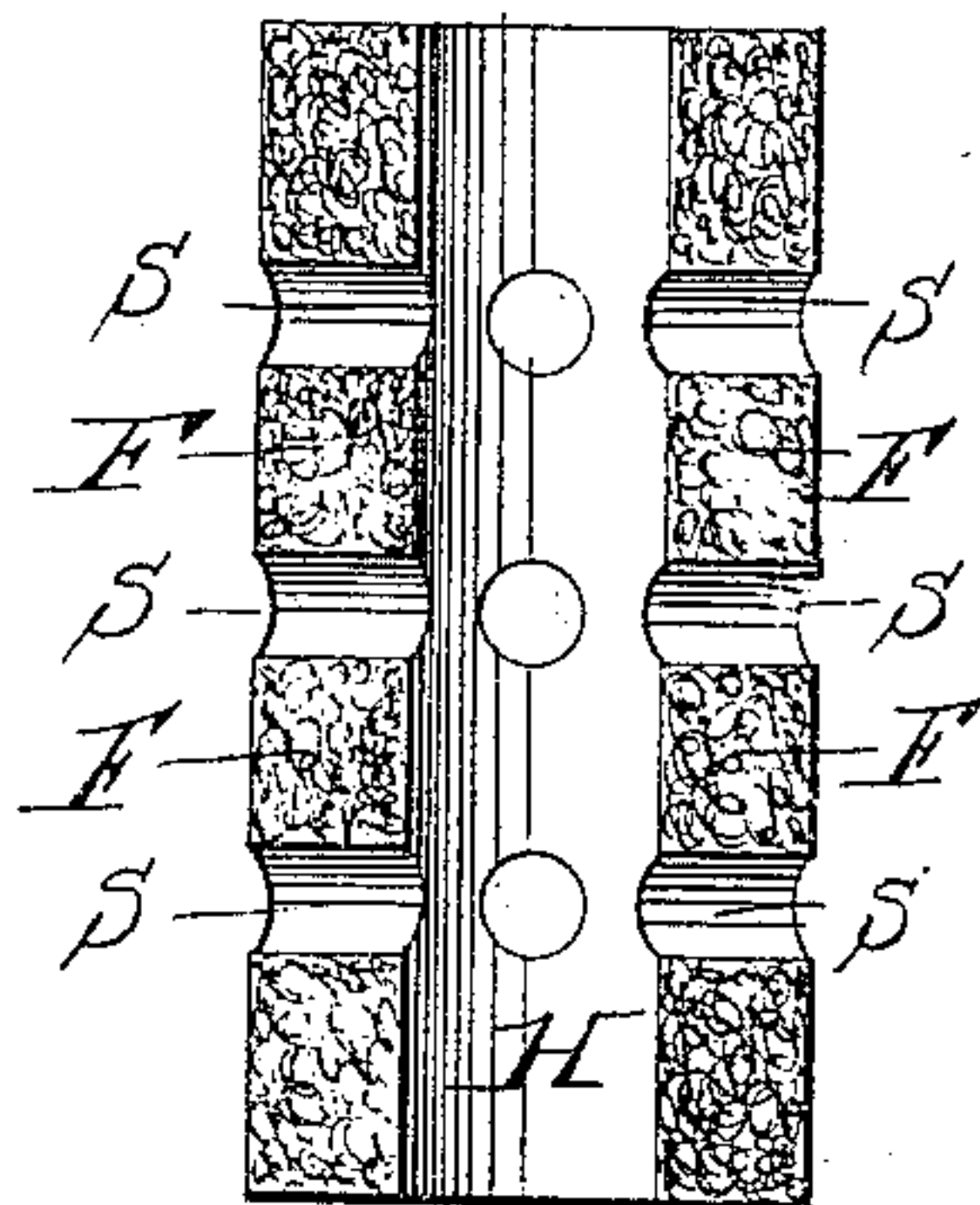
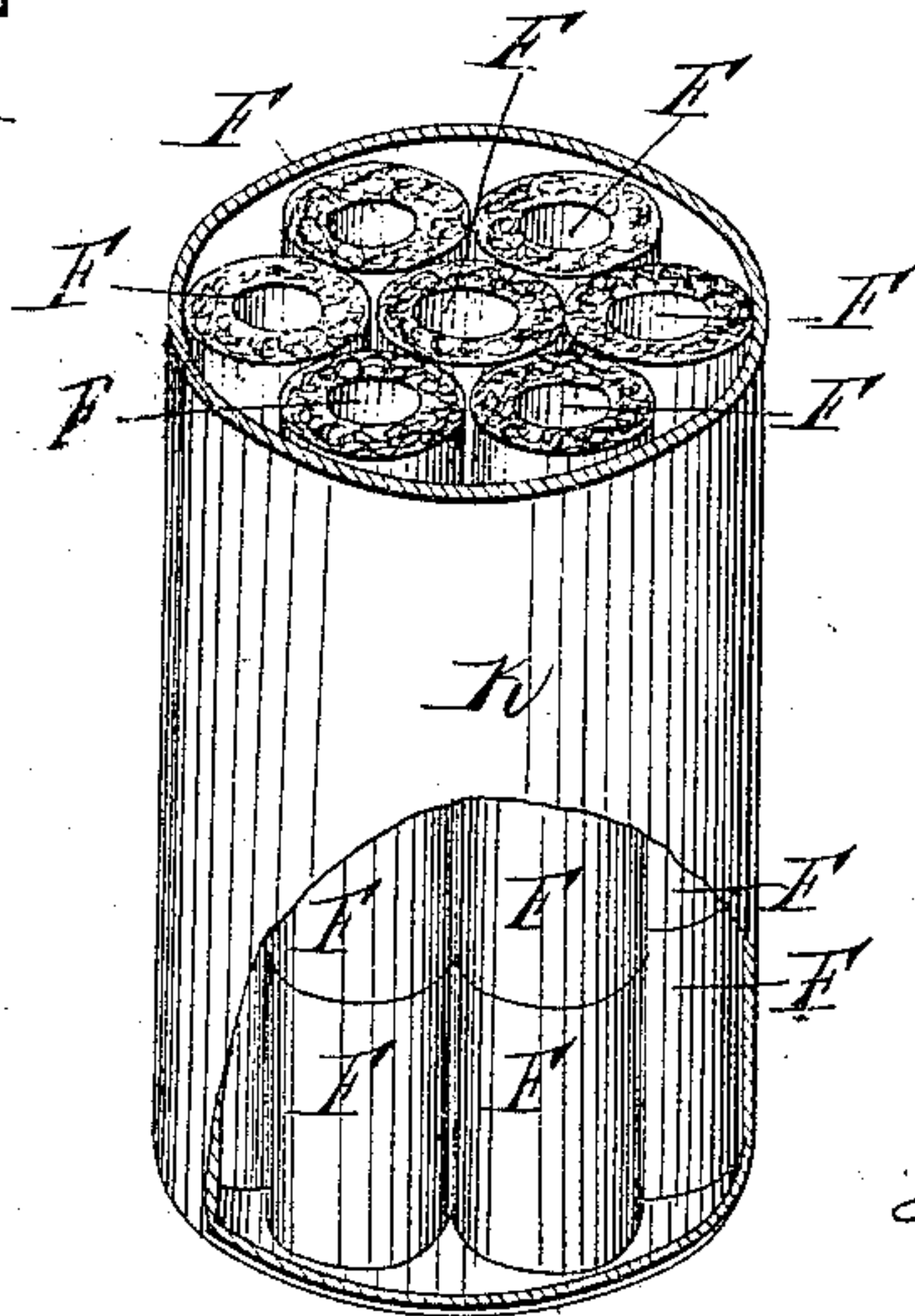


Fig. 5.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN CARTRIDGES.

Specification forming part of Letters Patent No. 51,672, dated December 19, 1865.

*To all whom it may concern:*

Be it known that I, TALIAFERRO P. SHAFFNER, of Louisville, in the county of Jefferson and State of Kentucky, have made a new and useful Improvement in Cartridges, which I term a "Hollow Fiber Cartridge;" and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, sufficient to enable one skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings, which are made part of this specification, and in which—

Figure 1 is a longitudinal central section. Fig. 2 is an elevation of a modification of the same, differing in point of construction. Fig. 3 is a view, partly in section and partly in elevation, of a cartridge with fuses and electric-circuit wires attached. Fig. 4 is a longitudinal section of a cylinder with radial or transverse spaces. Fig. 5 shows an aggregation of cylinders in an inclosing case or chamber, for torpedoes or artillery or mining purposes.

The invention consists of a hollow fiber cartridge, which is made, by preference, of an annular or cylindrical shape, and of nitro or gun cotton, being pressed to the required form. This form is shown in Figs. 1 and 3, in which F is the nitro or gun cotton, and H is the central cavity, which, in the latter figure, is occupied by the fuses G G, which are attached by branch circuit-wires D to the main battery-wires P N, which conduct the electric current, for the purpose of igniting the fuses.

Fig. 2 shows a modified form of the invention, in which the cylinder of nitro fiber is made of sections of rope, R, attached together, each inclosing a space, as in the other figures.

Fig. 4 shows the preferable form, in which transverse or radial spaces S connect with the central space H, for the purpose of more effectually disseminating the fire through the compressed mass of fiber.

Fig. 5 shows a number of these cylinders F aggregated together, so as to form a heavy charge. They may be made as represented, so as to be built up upon each longitudinally, and placed laterally against piles similarly arranged. They are shown with a case, K,

around them, which may form the walls of a chamber, a torpedo, or otherwise, as the nature of the case may determine.

I prefer to use an electric fuse, which is introduced as shown in Fig. 3, though any kind of fuse may be used.

The advantage to be derived from this mode of constructing cartridges is the instantaneous explosion of the whole mass, which is produced by the simultaneous ignition of the fuses, which are at different points.

I ordinarily use loose nitrated cotton in the spaces H and S S, to aid in disseminating the fire. In this manner I increase the destructive force of the charge to at least one hundred times that of a similar weight of gunpowder ignited at one point.

The application of the fuse, as above described, in the respective cylinders in Fig. 5—as a torpedo, for example—will vastly increase the area of the explosive force upon the surface of the water, and the explosion of the torpedo thus arranged is so instantaneous that the force so acts upon the water as to compel that incompressible but mobile fluid to act directly upon the vessel to stave it in or break it.

Fig. 4 shows the typical or preferable form of the invention, in which the walls of the cylinder are perforated with transverse apertures S S, so as to enable the fire to reach as large a surface of the compressed cotton as possible.

The open spaces around the fuses and the openings S S are filled with loose nitro-cotton, which materially assists the explosion by acting as a connecting medium between the ignited fuses and the compressed cartridge of nitro fiber.

In some cases the cartridge of compressed nitro fiber may be of such a loose texture on the surface as to render needless the addition of the loose cotton above spoken of; but, as a general thing, I prefer to use it.

The aggregated cylinder represented in Fig. 5 may consist of simple hollow cylinders of compressed nitro fiber, as in Fig. 1, of cylinders whose walls are formed of ropes or cords, as in Fig. 2, or cylinders with transverse openings, as represented in Fig. 4, the latter being altogether preferable, and the former, Figs. 1

and 2, being merely modifications, comparatively incomplete forms, but which are substantially effective.

Having thus described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The hollow cartridge of compressed nitro fiber, affording, by its central opening, a space for the introduction of the electric or other fuse or fuses by which explosion is obtained.

2. The introduction of loose nitrated fiber

in the cavity or cavities of a compressed cartridge, to assist in the dissemination of the fire from the ignited fuse or fuses.

3. The branchial or ramifying spaces S S, irrespective of form, direction, or number, but proceeding from the fuse cavity or cavities of a compressed cartridge, for the purpose described.

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Witnesses:

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