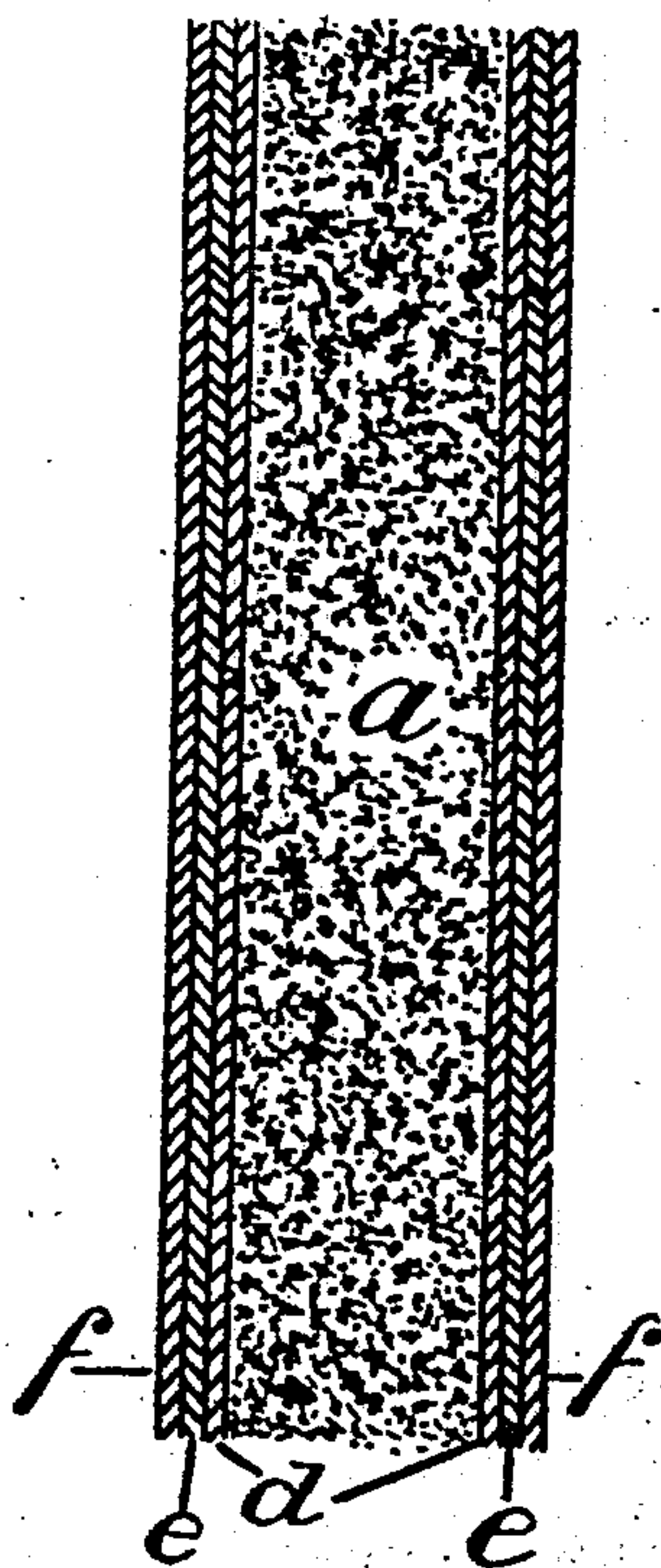


(No Model.)

A. F. ANDREWS.
SAFETY FUSE.

No. 424,449.

Patented Apr. 1, 1890.



Witnesses:

Edward E. Claussen
Harry E. Bacharach.

Inventor:

Albert F. Andrews,
by Simonds & Burdett,
Attys.

UNITED STATES PATENT OFFICE.

ALBERT F. ANDREWS, OF AVON, CONNECTICUT.

SAFETY-FUSE.

SPECIFICATION forming part of Letters Patent No. 424,449, dated April 1, 1890.

Application filed August 9, 1889. Serial No. 320,199. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. ANDREWS, of Avon, in the county of Hartford and State of Connecticut, have invented a certain new and useful Improvement in Safety-Fuses, of which the following is a description, reference being had to the accompanying drawing, where the figure is an enlarged view, in section, of a piece of safety-fuse made in accordance with my improvement.

From practical experience it seems to be a necessity to use oil in and on jute in the process of making it into the jute yarn for the above purpose—at least the jute-yarn which comes to a fuse-maker always contains more or less oil. Putting jute yarn, thus containing oil, in contact with the gunpowder has a deadening and deleterious effect on the gunpowder.

The object of the present improvement is to retain the jute, but prevent its oil from coming in contact with the gunpowder.

In the figure the letter *a* denotes a central filling of gunpowder. Next, and outside the powder, is a tube *d* of cotton yarn composed of two layers wound spirally in opposite di-

rections, coated with tar. Next, and outside this cotton tube just mentioned is a tube *e*, formed of jute yarn wound spirally in a direction opposite that of the outer spiral of the tube *d*. Outside the whole is a coat or tube *f*, of spirally-wound cotton yarn, the spiral thereof running in the direction opposite that of the spiral of the jute yarn *e*. The tube *d* may be made of cotton cloth, and the coat *f* may be a tape, without departing from the spirit of the improvement. The tarred cotton tube *d* effectually prevents the oil of the jute yarn from having access to the central filling of gunpowder.

I claim as my improvement—

A safety-fuse having a central filling of gunpowder, a tube of tarred cotton next the powder, a tube of jute next outside said cotton tube, and next and outside said jute a tube of cotton, all substantially as described, and for the purpose set forth.

ALBERT F. ANDREWS.

Witnesses:

A. B. JENKINS,
H. E. BACHARACH.