F. I. DU PONT.

DRIER FOR NITROCELLULOSE.

APPLICATION FILED JULY 18, 1917.

1,301,409. Patented Apr. 22, 1919.

2 SHEETS—SHEET 1.

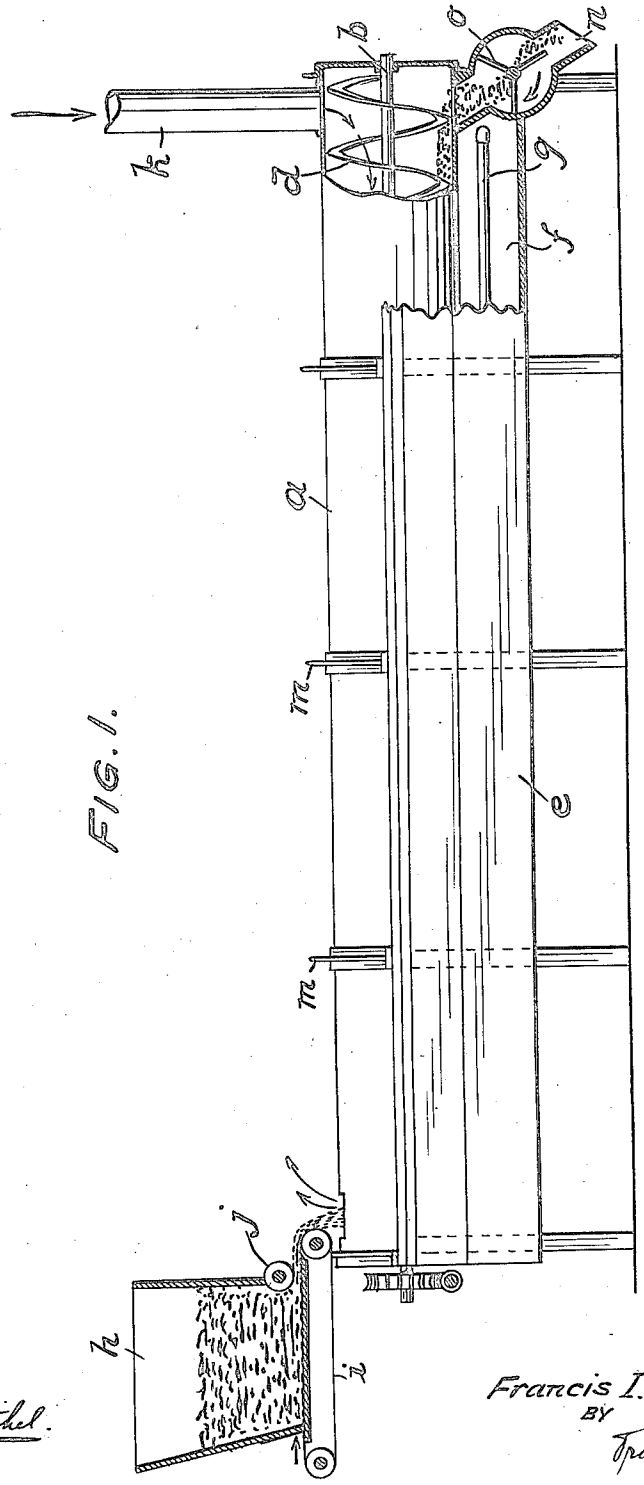

FIG. 1.

WITNESS:

Robert R. Ketchel.

INVENTOR

Francis I. du Pont

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F. I. DU PONT.

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2 SHEETS—SHEET 2.

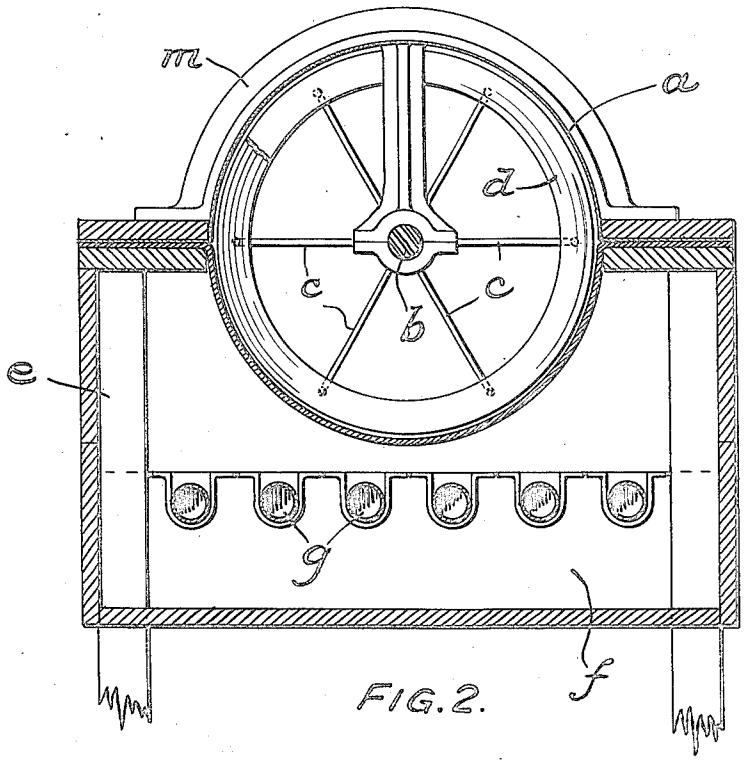

FIG. 2.

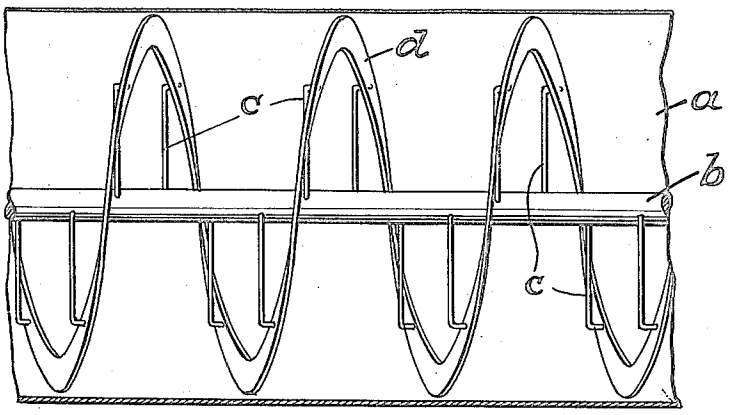

FIG. 3.

WITNESS:

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UNITED STATES PATENT OFFICE.

FRANCIS I. DU PONT, OF WILMINGTON, DELAWARE.

DRIER FOR NITROCELLULOSE.

1,301,409. Specification of Letters Patent. Patented Apr. 22, 1919.

Application filed July 18, 1917. Serial No. 181,227.

To all whom it may concern:

Be it known that I, FRANCIS I. DU PONT, a citizen of the United States, residing at Wilmington, county of New Castle and State of Delaware, have invented a new and useful Improvement in Driers for Nitrocellulose, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

The object of my invention is to provide a drier which, although capable of other uses, is adapted more especially to the drying of nitrocellulose, prior to treatment with ether and alcohol, in the manufacture of smokeless powder.

A preferred embodiment of the invention is shown in the accompanying drawings, in which—

Figure 1 is an elevation, partly in section, of an apparatus embodying my invention.

Fig. 2 is an enlarged cross-section through the drying cylinder and heating chamber.

Fig. 3 is a longitudinal section of a portion of the drying cylinder.

Through a long stationary casing or cylinder *a* extends a rotary power-driven shaft *b* having spokes *c* to which is secured a worm or spiral *d* extending close to the inner wall of the cylinder. The cylinder is supported on a frame-work *e*, which is shaped to form a chamber *f* through or into which the cylinder extends. Heating pipes *g* extend through the chamber.

At the admission end of the cylinder is located a hopper *h* having its bottom closed by an endless carrier *i*, which, with the roller *j*, transfers the nitrocellulose in a slow, measured and substantially continuous stream from the hopper to the cylinder.

At the discharge end of the cylinder is a pipe *k* through which air may be forced with just sufficient pressure to cause it to circulate through the cylinder within the spiral in the direction opposite to that of the travel of the nitrocellulose.

The upper part of the cylinder is made of thin sheet metal so that in the event of explosion it will readily rupture without injuring the other parts of the drier. The supports *m* carried by, or forming part of, the frame-work *e*, extending over the top of the cylinder are made relatively heavy so that they will remain intact in case the upper part of the cylinder is blown out by the firing of the nitrocellulose as it is passing through the drier.

The discharge end of the cylinder has a discharge chute *n* provided with rotary feed blades *o* for delivering the nitrocellulose without permitting escape of the warm air used for drying. The discharge chute leads to the apparatus within which the nitrocellulose undergoes further treatment.

Having now fully described my invention, what I desire to claim and protect by Letters Patent is:

1. In a drier for nitrocellulose, the combination with a heating chamber, of an imperforate cylinder extending within the chamber, the upper part of the cylinder being formed of rigid material and held in rigid and permanent relationship to the lower part of the cylinder and which is thin relatively thereto and which is thereby adapted, in the event of accidental firing of the nitrocellulose during drying, to offer inferior resistance to the explosive force, whereby danger to the operatives and destruction of the main part of the drier are avoided.

2. In a drier for nitrocellulose, the combination with a heating chamber, a cylinder extending within the chamber, the upper part of the cylinder being formed of relatively light material so that it will readily rupture in the event of explosion, and a relatively heavy support extending over the cylinder.

In testimony of which invention, I have hereunto set my hand, at Wilmington, Delaware, on this 12th day of June, 1917.

FRANCIS I. DU PONT.