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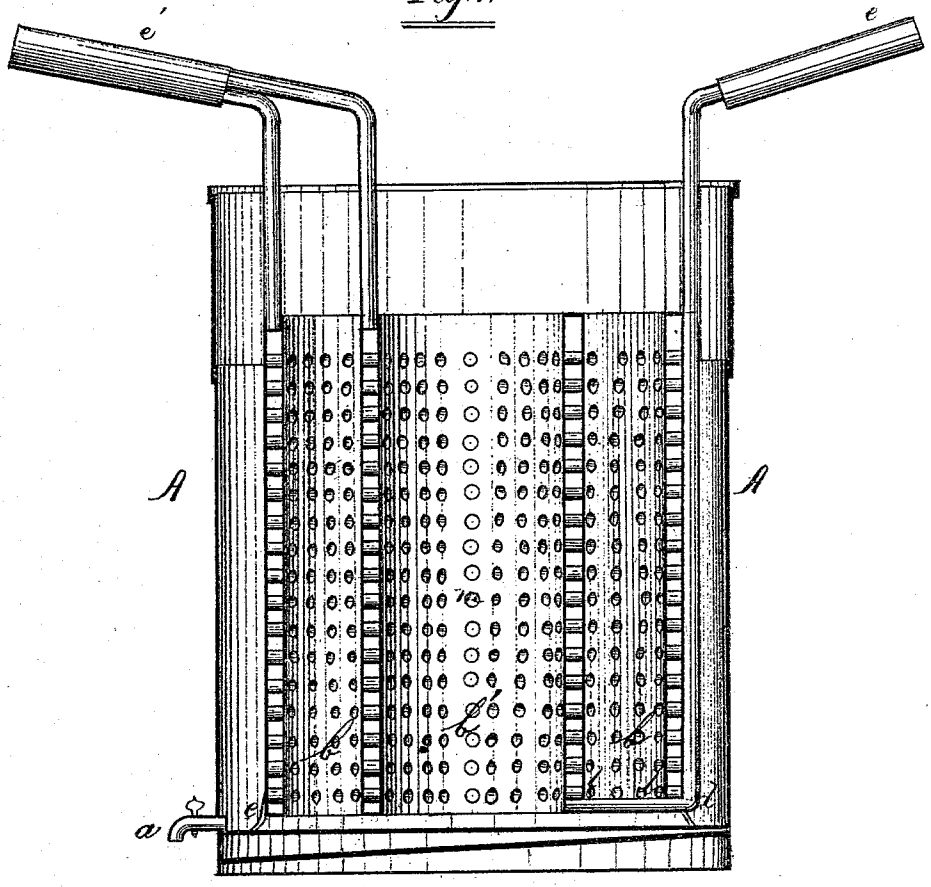
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C. Dittmar,

Manf. Nitroglycerine.

No. 99,070. Patented Jan. 25. 1870.

Fig. 1.



Witnesses.

v. Schlieb

W. ...

Inventor.

Carl Dittmar.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

3. Sheets, Sheet 2.

C. Dittmar,

Manf. Nitroglycerine.

No. 99070. Patented Jan. 25. 1870

Fig. 5.

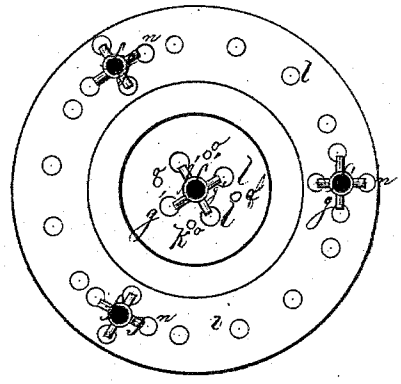
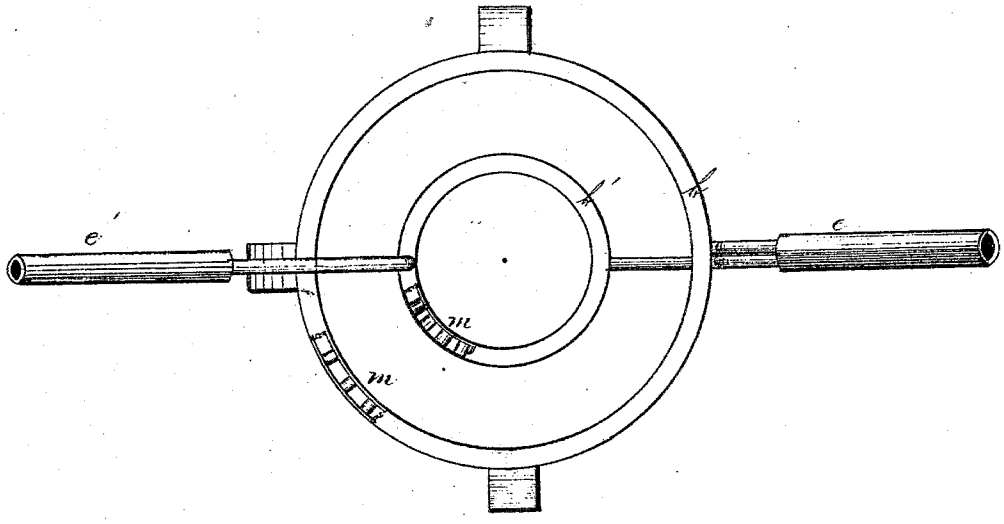


Fig. 2.



Witnesses
v. Schultze
Orimmer

Inventor:
Carl Dittmar

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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C. Dittmar,

Manf. Nitroglycerine.

No. 99,070. Patented Jan. 25. 1870.

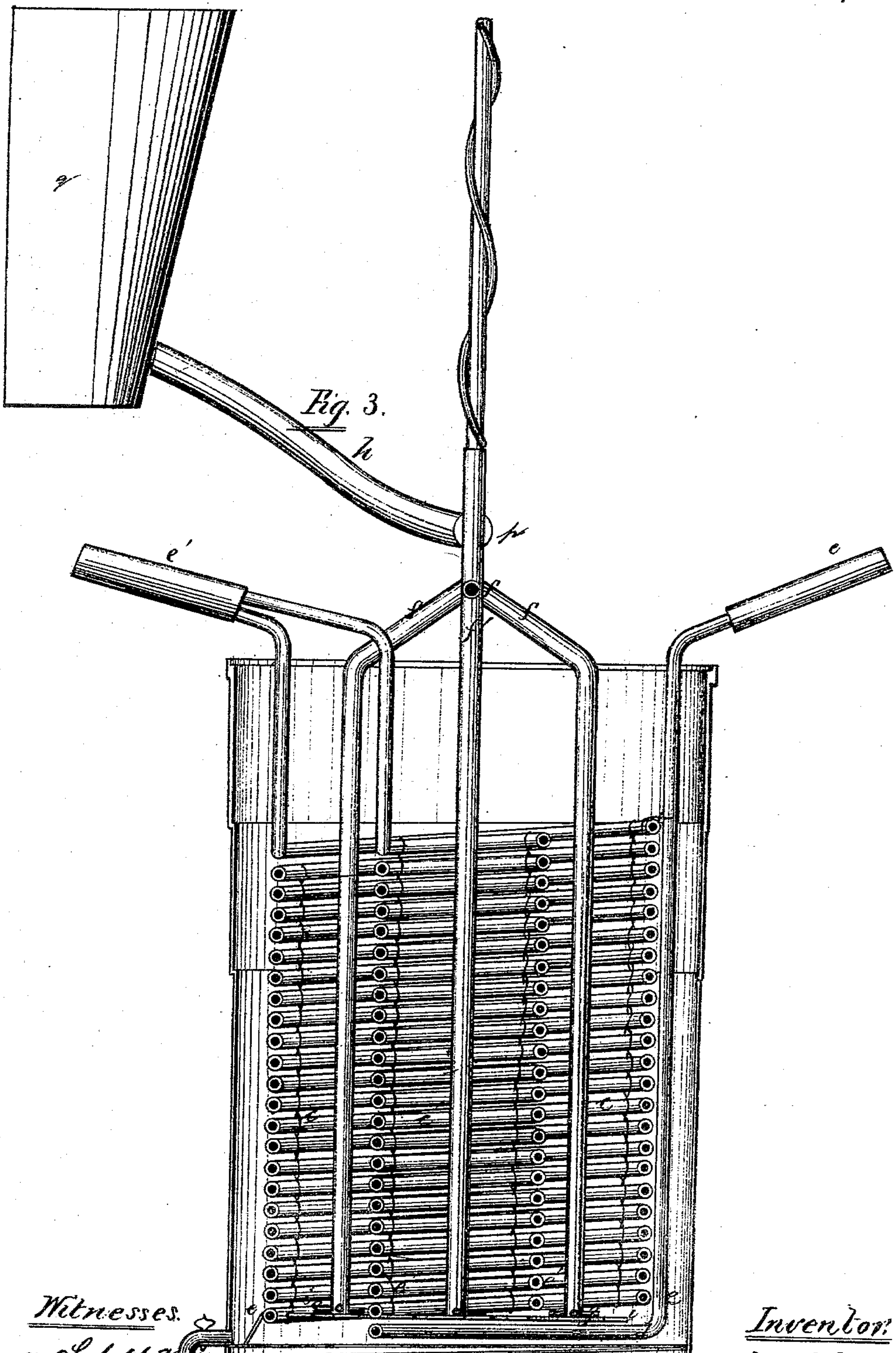


Fig. 3.

Witnesses.
v. Schilke
[illegible]

Inventor
Carl Dittmar

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

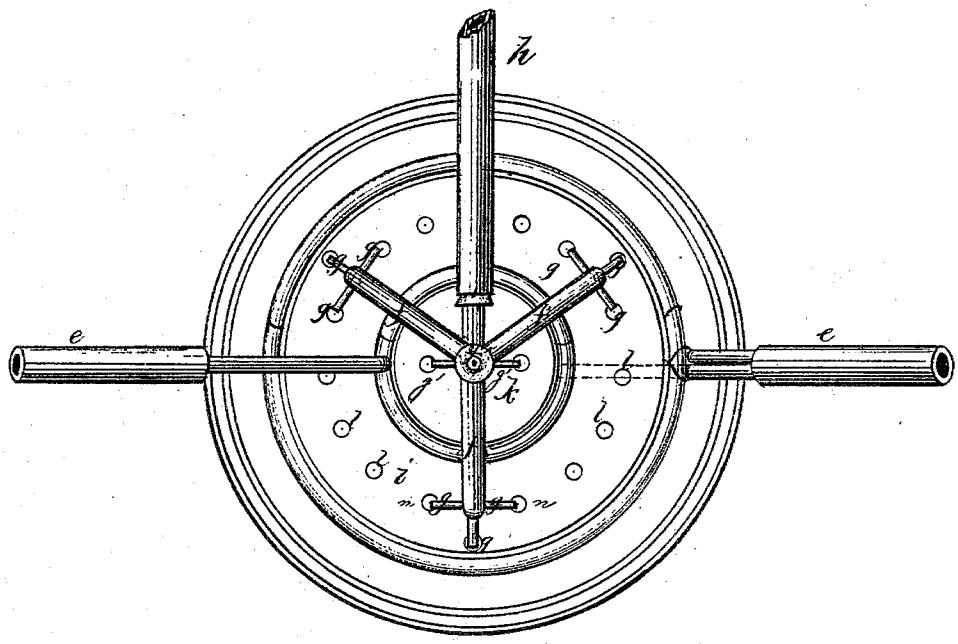
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C. Dittmar,

Manf. Nitroglycerine.

No. 99,070. Patented Jan. 25. 1870.

Fig. 4.



Witnesses

W. Schelcher

Inventor.

Carl Dittmar

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CARL DITTMAR, OF CHARLOTTENBURG, PRUSSIA.

IMPROVEMENT IN THE MANUFACTURE OF XYLOGLODINE, AND OTHER EXPLOSIVE AGENTS.

Specification forming part of Letters Patent No. **99,070**, dated January 25, 1870.

I, CARL DITTMAR, of Charlottenburg, in the Kingdom of Prussia, have invented an Improved and useful Apparatus for the Manufacture of Xyloglodine, Nitro-Glycerine, Diazo-Benzole-Toluole, Nitro-Starch, Nitro-Cellulose, and kindred explosive agents, as well as of Nitro-Benzole, Nitro-Benzole-Toluole, and similar compounds.

By means of my apparatus, from four to five hundred weight of any of the above-named or kindred substances may be prepared in from fifteen to twenty minutes.

My arrangement for mixing the several ingredients and rapidly cooling the mixture, renders the process of manufacture absolutely free from danger.

Description.

Figure 1. A A represent a curved tank, about four feet in diameter and five feet high, and made of—*a*, iron, having a leaden plate covering the bottom; *b*, wood, lined with heavy leaden plate; *c*, lead; or *d*, clay.

The bottom of the tank inclines toward the faucet *a*, which is preferably made of clay. This faucet has a diameter of about three inches, and is used for drawing the mixed materials from the tank A.

b b and *b'* represent two hollow cylinders, the perpendicular walls of which are distant about one or one and a half inch from each other.

m m, Figs. 1 and 2, are short pipes, about one inch in diameter and one and a half inch in length, connecting the inner and outer surface of each cylinder. These pipes may be placed in the number of ten or more to a square foot of surface.

The hollow cylinders (made of lead, iron, or equivalent material) are connected by pipe *e* with reservoirs containing cold water, and may also be connected with each other.

They empty, by pipe *e'*, into suitably-placed reservoirs, that serve to receive the cooling-water, after it has passed through the cylinders. A full and rapid flow of water through the cylinders is secured by means of pressure, a force-pump, or suction. The object of this mode of constructing these cylinders is, that the mixture contained in the tank not only comes in contact with the surface of the cylinders, but is also forced through the short pipes *m m*.

In Fig. 3, two worms, *c c* and *c'*, made of leaden pipe, about one inch in diameter in the clear, are represented, which may be used instead of the cylinders *b b* and *b'*, and are placed in a position within the tank similar to that designated for the latter, the smaller worm concentrically within the worm *c c*, leaving a space of about ten inches between the inner surface of worm *c c* and the outer surface of the worm *c'*. The cylinder *b b* or worm *c c* reaches to the inner surface of the tank to within one and a half inch.

The three lead-coated iron tubes *f f f*, in Figs. 3, 4, 5, about three-fourths of an inch in diameter, are attached to and support the annular lead-coated iron perforated disk *i i*, Figs. 3, 4, 5, which is about three-fourths of an inch thick.

From each pipe, at its junction with the disk, four leaden pipes, *g g g g*, about four inches long, extend to the four holes *n n n n*. These holes have a diameter of one inch, while the other perforations of the disk have a diameter of only half an inch.

The annular disk *i i* moves perpendicularly and spirally between the two worms *c c* and *c'* or the cylinders *b b* and *b'*.

The three-quarter-inch lead-coated iron tube *f'* is attached to and supports the perforated lead-coated iron disk *k*.

From the tube radiate short leaden pipes, *g'*, Figs. 3, 4, 5, to corresponding holes in the disk. These holes, like the feed-holes *n n* in the annular disk, have a diameter of one inch. The small holes *o o o*, between them, have a diameter of half an inch only. The disk operates within the worms or cylinders.

Pipe *f'* expands to a diameter of one and a

half inch, at or near point *p*, where it receives, by means of a flexible tube, *h*, the material from the reservoir *q*. Pipes *f f f* connect here with pipe *f'*.

This apparatus is caused to operate perpendicularly by reciprocating motion, communicated in any ordinary manner.

Claims.

I claim as my invention and desire to secure by Letters Patent—

1. The application of concentric double cylinders or worms for cooling.

2. The improved construction of my stirring apparatus by means of hollow tubes, for thoroughly mixing the materials contained in the tank A, substantially as and for the purposes described.

CARL DITTMAR.

Witnesses:
V. SCHELIHA,
W. M. MEW.