

G. M. MOWBRAY.  
 APPARATUS FOR THE MANUFACTURE OF NITROGLYCERINE,  
 NITROBENZOLE, &c.

No. 106,607.

Patented Aug. 23. 1870.

Fig. 1.

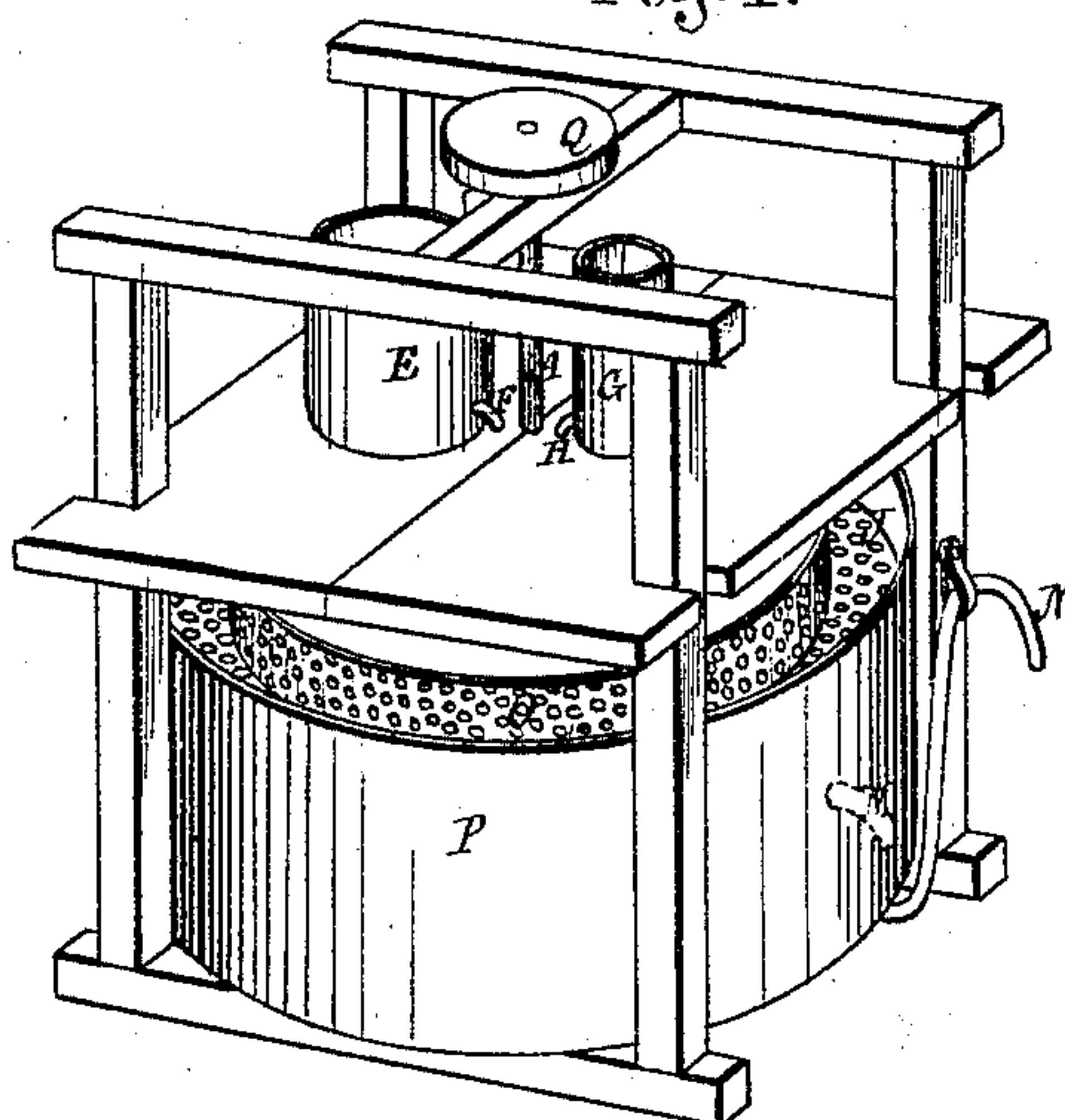
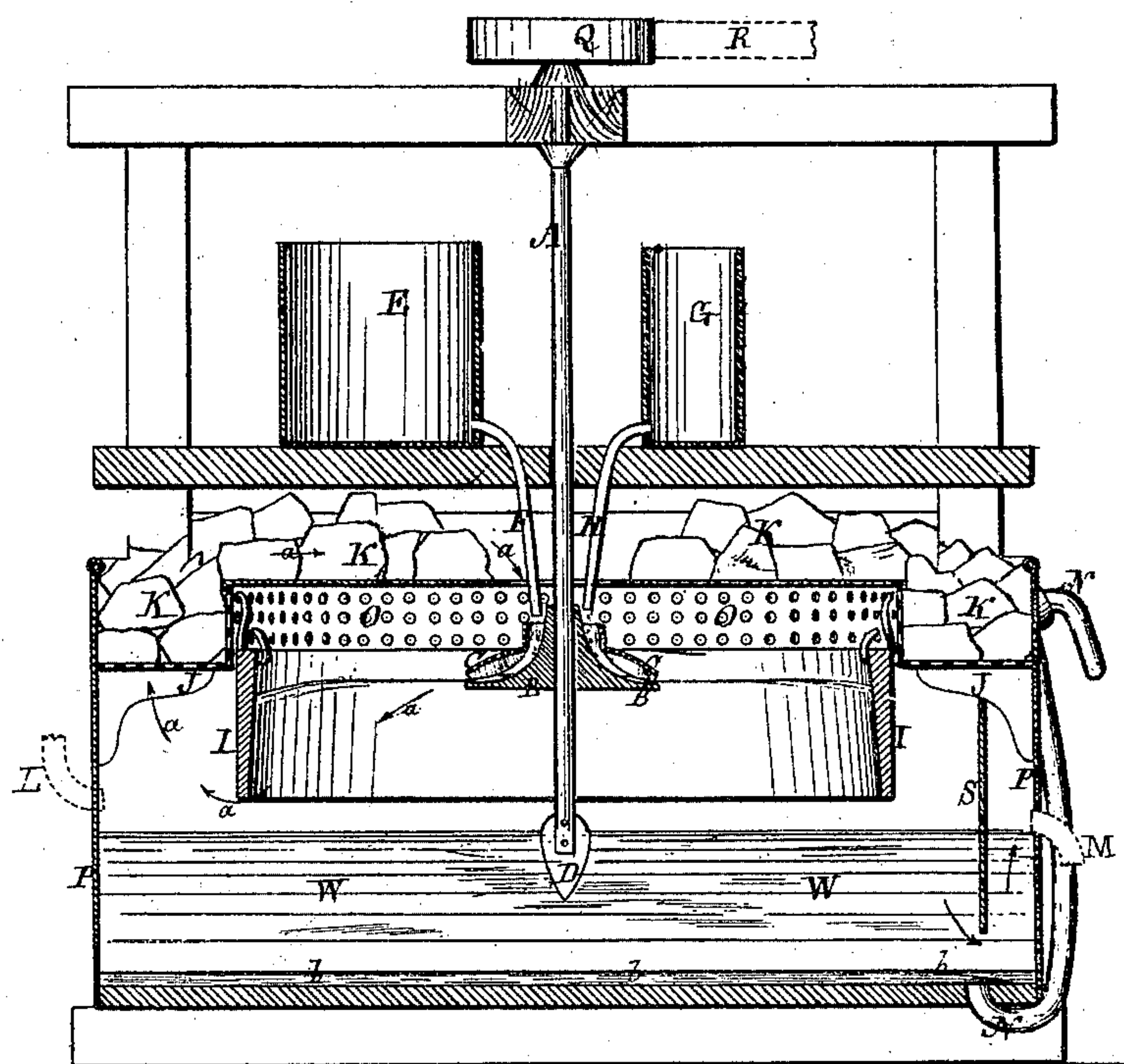


Fig. 2.



Witnesses.

H. H. Myatt

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# United States Patent Office.

GEORGE M. MOWBRAY, OF NORTH ADAMS, MASSACHUSETTS.

Letters Patent No. 106,607, dated August 23, 1870.

## IMPROVEMENT IN APPARATUS FOR THE MANUFACTURE OF NITRO-GLYCERINE, NITRO-BENZOLE, &c.

The Schedule referred to in these Letters Patent and making part of the same.

I, GEORGE M. MOWBRAY, of North Adams, in the county of Berkshire and State of Massachusetts, have invented certain Improvements in Apparatus for Manufacturing Nitro-Glycerine, Nitro-Benzole, &c., of which the following is a specification.

The nature and object of my invention is an apparatus to be used for mixing and combining glycerine, benzole, and similar matters, with nitric and sulphuric acids (previously mixed and cooled) in a continuous and automatic manner, delivering the mixed ingredients, cooled and free from nitrous fumes, into water, so as to precipitate therein the nitro-glycerine, nitro-benzole, &c., the continuation of the work or operation being limited only by the supply of the requisite materials and motive power.

In respect to continuance of the operation, my invention differs from every method hitherto practiced or described, since all former modes of manufacturing these preparations are alternate.

### Description of the Drawings.

- A, spindle,
- B B, centrifugal basin,
- C C, annular plate, with radial fans on its lower surface and attached to basin B B,
- D, revolving paddle or stirrer,
- E, tank, lined with lead, for mixed acids;
- F, delivery-pipe, for conducting and gauging acids to centrifugal basin,
- G, tank for glycerine, benzole, &c.;
- H, delivery-pipe for conducting and gauging glycerine, benzole, &c., to centrifugal basin;
- I, collecting-rim or receiving-surface, of lead or enameled iron, to receive spray of mixed ingredients distributed by centrifugal basin B B,
- J J, bracketed slats, forming an ice-strainer;
- K K K K, ice,
- L, cold-water supply-pipe,
- M, refuse acid water waste-pipe,
- N, nitro-glycerine delivery-pipe of vulcanized rubber,
- O O O O, suspended floor or cover, to sustain ice supply,
- P P P, precipitating tank;
- Q, pulley arrangement, for transmitting motion;
- R, belt, giving motion to pulley,
- S, separating diaphragm. The acid water passing under this diaphragm deposits the nitro-glycerine, &c., and passes in the direction of the arrows out of the tank by the eduction-pipe M.
- a a a a, arrows, indicating direction of air and nitrous fumes, impelled by the centrifugal motion;
- b b b, precipitated nitro-glycerine, &c.

### Operation of the Apparatus.

Motion being given to the spindle A, the proportionate supply of mixed sulphuric and nitric acids, in relation to the requisite supply of glycerine, are allowed each of them, to flow onto the lower basin B B, which, by its centrifugal motion—

First, mixes the ingredients.

Second, extends the mixed ingredients over considerable superficies, thereby enabling the nitrous fumes to leave the mixture readily, while the peculiar shape of the basin B B slightly retards the liquid mixture in its flow.

Meanwhile, the annular disk C C, being armed on its lower surface with radial fans, sweeps a current of ice-cold air, drawn from the ice supply K K K, over the surface of the mixture, and cools it by contact, and said air having taken up the nitrous fumes (evolved by the action of the mixed acids on the glycerine) and cooled the mixture, as before described, passes on toward the staves of the tank, in the direction of the arrows a a a a, up through the ice, resting on the bracketed slats or ice-strainer J J, where it is stripped of its nitrous fumes, again cooled, and is again drawn toward the spindle A in continuous circulation.

Third, the mixed acids and glycerine having arrived at the periphery of the basined disk B B, (having been cooled and deprived of nitrous fumes, as above described, by the ice-cold air,) are thrown onto the receiving-rim or plate I I, and thence flow by their own gravity into the water W, contained in the tank P P P.

The excess of acid is now taken up by the water, and the nitro-glycerine is precipitated on the floor of the tank. The acid water passing out of the waste-pipe M, the nitro-glycerine is collected by means of the flexible vulcanized pipe N N.

The revolution of the spindle A revolves the paddle or stirrer D, thus causing a circulation of the water in the tank P P P, which water presents fresh surfaces continually for the acid ingredients streaming from the rim I I to mingle with.

### Claims.

What I claim as my invention, and desire to secure by Letters Patent, is.

1. The spindle A, paddle or stirrer D, lower centrifugal basin B B, with the upper annular disk and attachments C C, arranged substantially as described and for the purposes set forth.
2. The sheltered or partially covered tank P P P, with the inner rim I I, bracketed slats J J, suspended ice-floor O O O O, inlet-pipe L, waste-outlet M, and nitro-glycerine, &c., eduction-pipe N, arranged substantially as described, and for the purposes set forth.
3. The combination of the centrifugal apparatus, with the fixed tank P P P, and its appurtenances surrounding the spindle A, arranged substantially as described, and for the purposes set forth.

GEO. M. MOWBRAY.

Witnesses:

A. B. STOUGHTON,  
EDMUND MASSON.