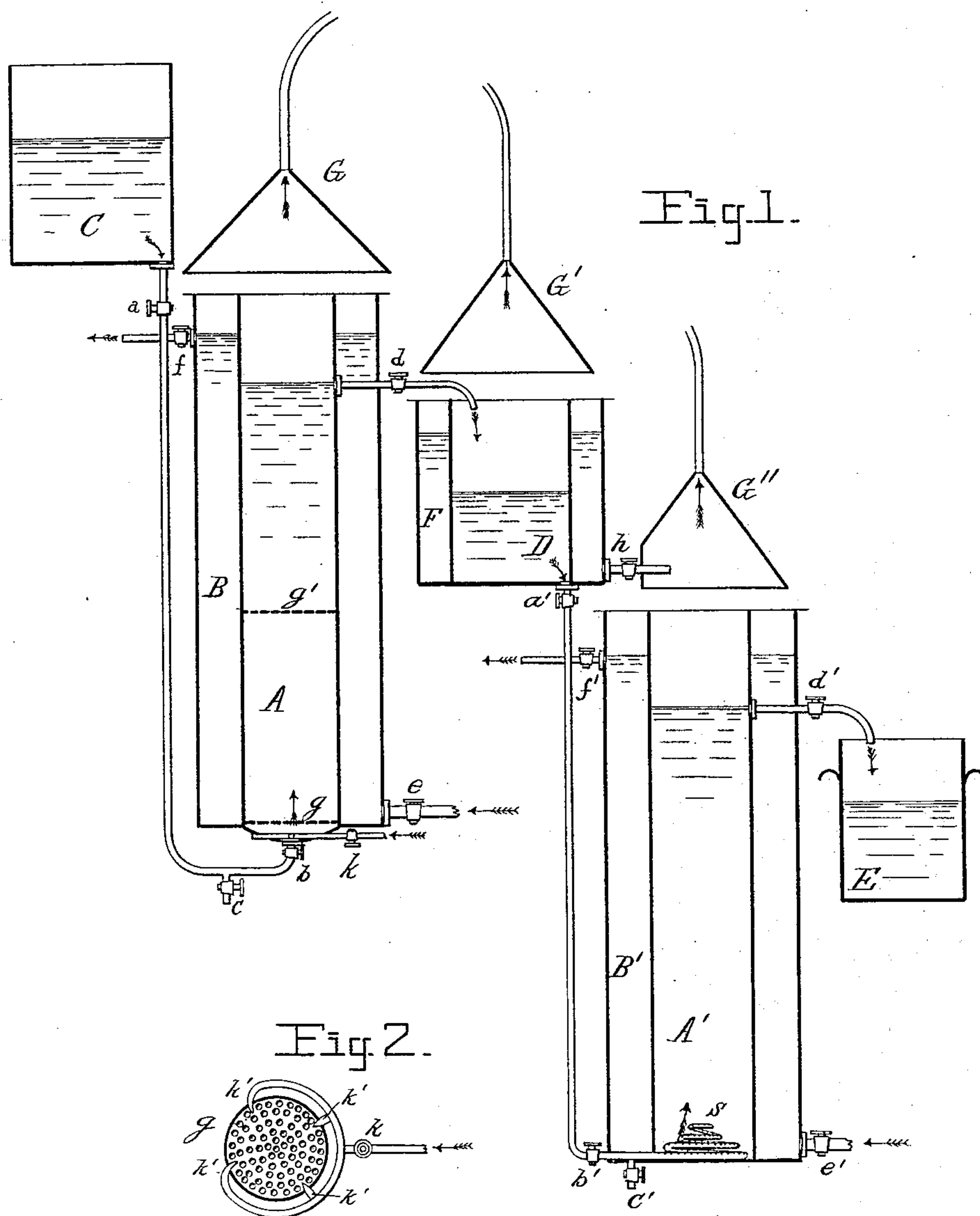


(No Model.)

J. A. HALBMAYR.
MANUFACTURING EXPLOSIVES.

No. 403,749.

Patented May 21 1889.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOSEF ANTON HALBMAYR, OF VIENNA, AUSTRIA-HUNGARY.

MANUFACTURING EXPLOSIVES.

SPECIFICATION forming part of Letters Patent No. 403,749, dated May 21, 1889.

Application filed June 11, 1888. Serial No. 225,575. (No model.)

To all whom it may concern:

Be it known that I, JOSEF ANTON HALBMAYR, a subject of the Emperor of Austria, and a resident of the city of Vienna, in the
5 Empire of Austria, have invented certain new and useful Improvements in the Manufacturing of Explosives from Tar-Oils, of which the following is a specification.

The manufacture of explosives from tar-oils
10 by the process of dropping the tar-oils into nitric acid is exceedingly difficult on account of the energetic reaction and of the consequent heating of the acid and nitro-derivatives, which are thereby partly decomposed,
15 thus causing great loss of material. These difficulties are avoided by the present new and improved process, according to which the tar-oils are caused to flow into the nitrating-acid and beneath the surface of the same and
20 in a state of division. This is effected by the use of high vessels filled up to two-thirds of their height with fuming nitric acid, and the tar oils are caused to enter into this acid beneath the surface of the same and in a state
25 of division by the use of perforated pipes or nozzles arranged beneath the surface of the nitrating-acid. For the purpose of still better dividing the entering stream of tar oils dry cold air under pressure is injected, which
30 also serves for cooling the liquid. Other means for cooling the liquid may also be used. By these means the nitration takes place quietly without raising the temperature of the liquid, and the nitro-derivatives collect on the
35 surface of the acid, from whence they can be drawn off in proportion to the fresh quantities of tar-oils conducted into the acid.

In the accompanying drawings, Figure 1 is a diagrammatic section of the apparatus I
40 use in carrying out my invention, and Fig. 2 is an inverted sectional plan of the bottom of one of the nitrating-vessels.

A and A' are the two nitrating-vessels, each surrounded by a cooling water-jacket, B B'.
45 The jacket B has its valved inlet at the bottom *e*, and its outlet at the top at *f*, while the jacket B' has its inlet and outlet correspondingly at *e'* and *f'*.

C is the elevated reservoir of oil to be

nitrated, and communicating through a
50 valved pipe, *a b*, with the bottom of the vessel A. This is provided with a finely-perforated false bottom, *g*, through which the oils pass in a finely-divided state into the acid in the vessel A. A second perforated diaphragm,
55 *g'*, may be used, if desired. Cold air under pressure is admitted through the valved pipe *h*, which has a number of discharge-nozzles, *h'*, Fig. 2, opening into the bottom of the vessel A below the diaphragm *g*, in order to as-
60 sist in finely dividing the oil and at the same time keeping it cool.

From the upper part of the vessel A the nitrated oil passes off through the valved
65 pipe *d* to the cooling receiver D, which is provided with a water-jacket, F. From the receiver D the oils thence pass through the valved pipe *a' b'*, to be discharged through a finely-perforated coil, *s*, into the bottom of
70 the second nitrating-vessel A'. From the latter the nitrated oils pass to the receiver E. The gases from the vessels A, D, and A' pass off through the hooded pipes G G' G''. The pipes *a b* and *a' b'* may be provided at their
75 lowest bends with valved outlets *c* and *c'*. A precipitate of solid nitro derivatives is also formed, in which the nitration has taken place to a greater extent, and this precipitate is removed separately from the acid and is
80 washed with water. The thick sirup-like liquid drawn off from the surface of the acid contains mainly mononitro derivatives of the hydrocarbons found in the tar-oil and, in
85 minor quantities, binitro derivatives are dissolved therein.

If it is desired to conduct the nitration further, therefore, to manufacture mainly binitro
90 derivatives, it is necessary to repeat the above-described process, but using the afore-said sirupy liquid instead of tar-oil, and employing for the nitration a mixture of nitric
95 acid with sulphuric acid.

The nitro derivatives obtained are well washed with water, and when mixed with oxidizing substances yield very powerful explosives.

I claim as my invention—

The herein-described process of manufac-

turing explosives from tar oils, said process
consisting in conducting the oils into a body
of nitrating-acid from below the surface of the
latter in a state of division and at the same
5 time introducing cold air under pressure at
the same point with the oils, all substantially
as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOSEF ANTON HALBMAYR.

Witnesses:

C. O. PAGET,
T. BARTA.