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B. KNIFFLER.

PROCESS OF DISSOLVING SIZE FOR PAPER MAKING.

APPLICATION FILED JULY 7, 1905.

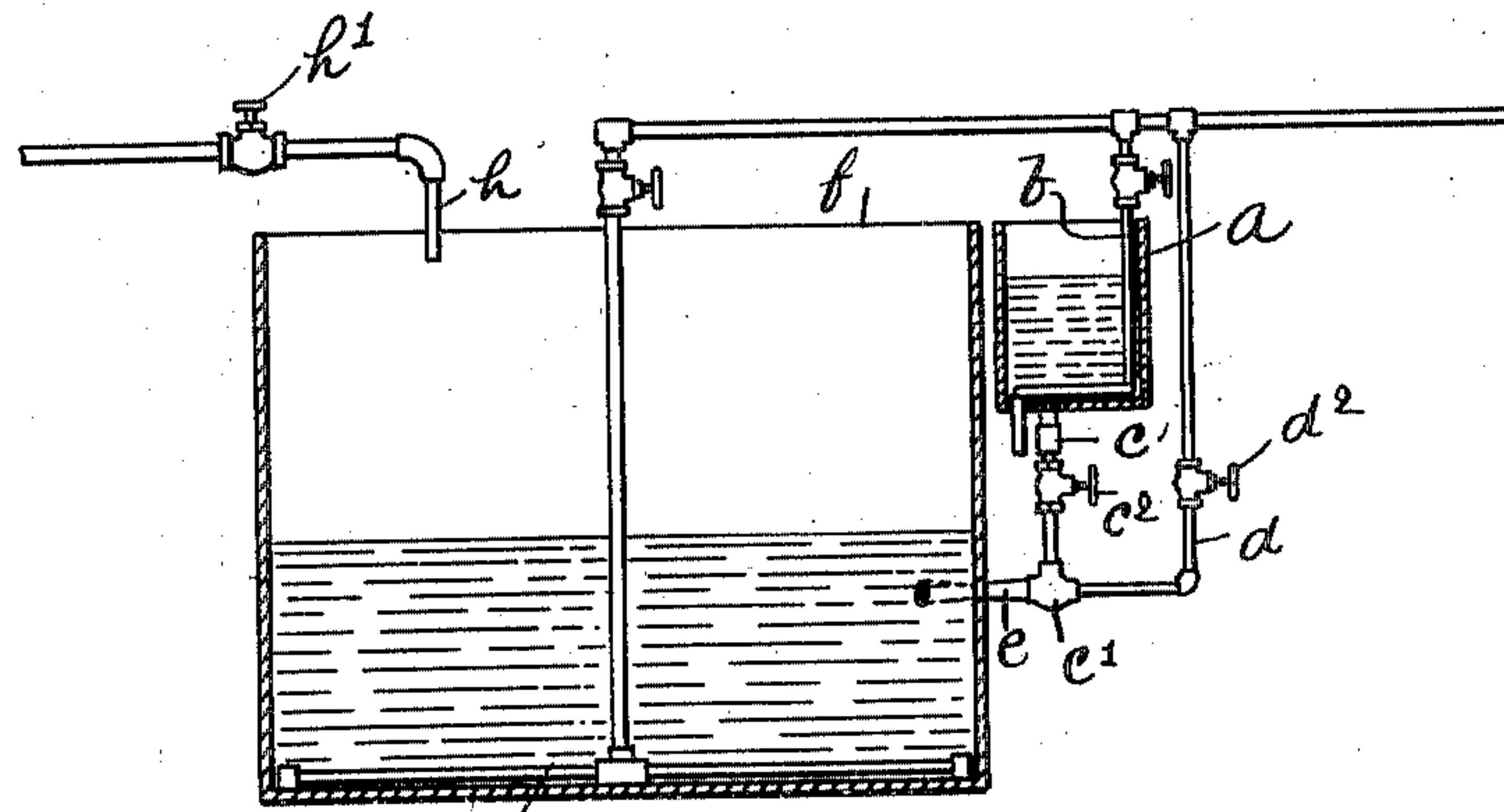


Fig. 1.

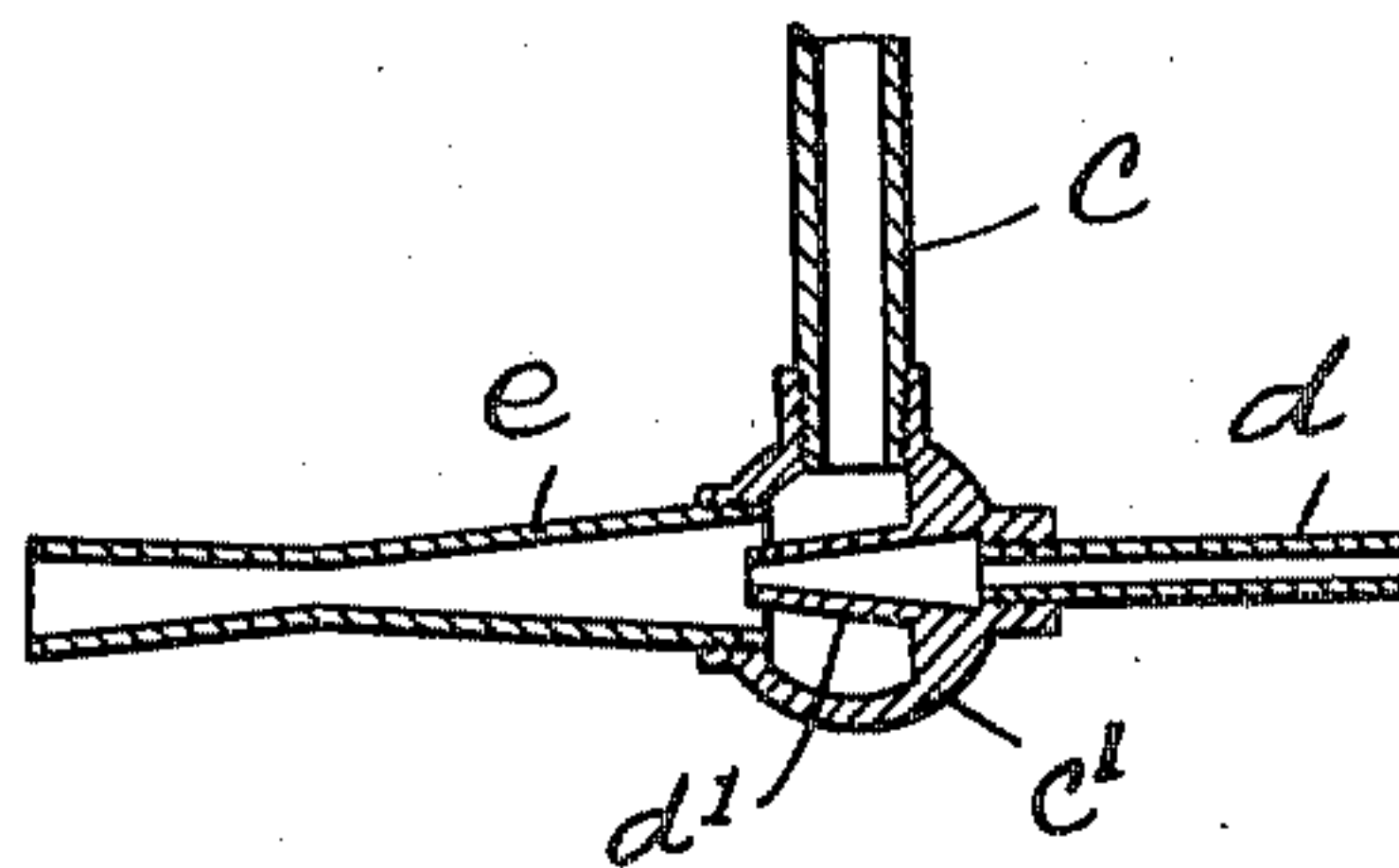


Fig. 2.

Witnesses:  
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# UNITED STATES PATENT OFFICE.

BRUNO KNIFFLER, OF STONEHAM, MASSACHUSETTS.

## PROCESS OF DISSOLVING SIZE FOR PAPER-MAKING.

No. 816,863.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed July 7, 1905. Serial No. 268,708.

To all whom it may concern:

Be it known that I, BRUNO KNIFFLER, of Stoneham, county of Middlesex, State of Massachusetts, have invented an Improvement in Processes of Dissolving Size for Paper-Making, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to a process for dissolving size for paper-making, and has for its object to improve the process to the end that a more perfect emulsion is produced with a size containing a larger percentage of free resin than the ordinary or commercial resin soap, such size being herein designated "resin size."

Figure 1 shows in partial elevation and vertical section one form of apparatus by which my improved process may be carried out. Fig. 2 is a sectional detail of the device for spraying the liquefied resin size into a measured volume of hot water.

In carrying out my invention a measured volume of resin size which contains a larger percentage of free resin than ordinary resin soap is heated and then sprayed into a measured volume of hot water to produce an emulsion, and the emulsion thus produced is agitated and a measured volume of cold water added to it, when it is ready for use. The dissolved size, therefore, when ready for use contains predetermined relative proportions of resin size and water, which in practice is important, as the strength of the emulsion is thus known accurately.

While it is obvious that many ways may be employed for carrying out my invention, one way is herein shown for the sake of illustration.

*a* represents a tank adapted to contain a measured volume of resin size. A steam-pipe *b* extends into and out of said tank for the purpose of heating the resin size. A pipe *c* leads from the bottom of the tank *a*, which conducts the liquefied resin size to a case or shell *c'*, which is of globular or other suitable form. A regulating-valve *c<sup>2</sup>* is contained in the pipe *c* to regulate the flow. *d* represents a steam-pipe which also leads to said shell or case *c'*, terminating at an injector-nozzle *d'*, which is contained within said shell or case. A regulating-valve *d<sup>2</sup>* is contained in the steam-pipe *d*. A discharge-pipe *e* leads from the case *c'* opposite and in alinement with the

injector-nozzle, which conducts the spray to a tank *f*, which contains a measured volume of hot water, the spray entering the hot water at a point below the level thereof and producing an emulsion. The water contained in the tank *f* is heated by a set of steam-pipes *g*, which are perforated to provide for the escape of the steam directly into the water, and said steam-pipes are connected with a main source of supply. The jets of steam issuing from the steam-pipes *g* also act to forcibly agitate the emulsion in the tank *f*.

*h* represents a pipe which is connected to a suitable supply of cold water, and *h'* a regulating-valve in said pipe, and by opening said valve *h'* a measured volume of cold water is first caused to flow into the tank *f*, and then said valve is closed, and then the measured volume of water contained in the tank is heated by the steam as aforesaid, and then the measured volume of liquefied resin size is sprayed into the measured volume of hot water to produce the emulsion, and the emulsion having been produced said valve *h'* is then opened and another measured volume of water caused to flow into the tank, which being thus added to the emulsion contained in said tank will further dilute it, and the dissolved size is then ready for use, being of a predetermined and known strength, the free resin being held in suspension.

The liquefied size entering the shell or case *c'* is so divided or disintegrated by the jet of steam issuing from the injector-nozzle that the spray which enters the hot water is composed of very minute particles, and as a consequence a more perfect emulsion is produced, and, furthermore, a size which contains a larger percentage of free or unsaponified resin than ordinary resin soap may be used, as the free resin will be emulsified, and therefore will act advantageously instead of injuriously when added to the paper pulp.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The process herein described of preparing size for paper-making, which consists in heating a measured volume of resin size, and spraying the liquefied size into a measured volume of hot water, to produce an emulsion, and then adding to the emulsion thus produced a measured volume of cold water.

2. The process herein described of preparing size for paper-making, which consists in



heating a measured volume of resin size, then  
spraying the liquefied size into a measured  
volume of hot water to produce an emulsion,  
and then agitating the emulsion thus pro-  
5 duced and adding thereto a measured volume  
of cold water.

In testimony whereof I have signed my

name to this specification in the presence of  
two subscribing witnesses.

BRUNO KNIFFLER.

Witnesses:

B. J. NOYES,

H. B. DAVIS.