

No. 686,930.

Patented Nov. 19, 1901.

R. W. HEARD & R. A. L. SNYDER.
PROCESS OF BUILDING UP SHEETS OF MICA.

(Application filed Apr. 24, 1901.)

(No Model.)

FIG. 1.

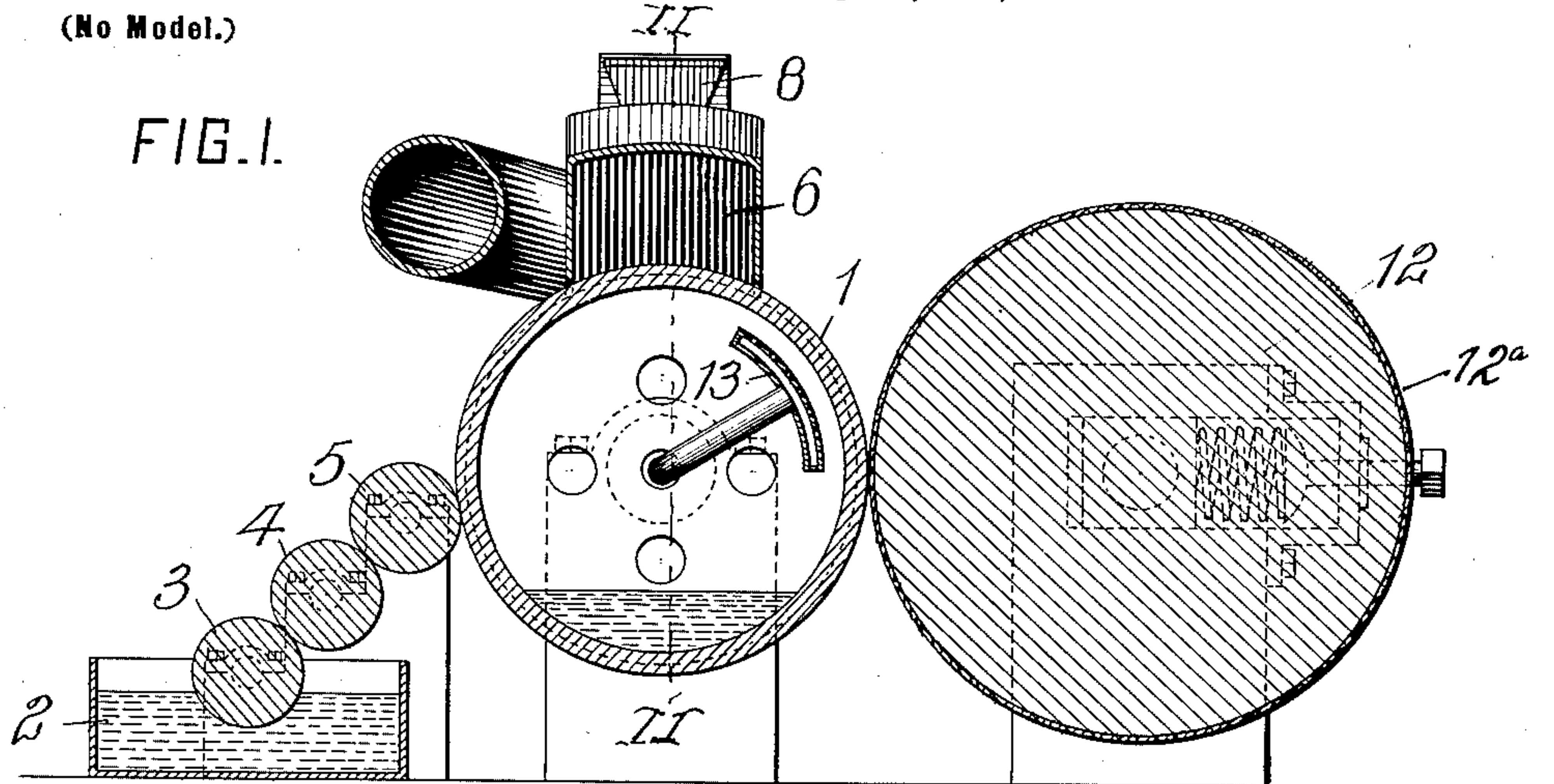


FIG. 2.

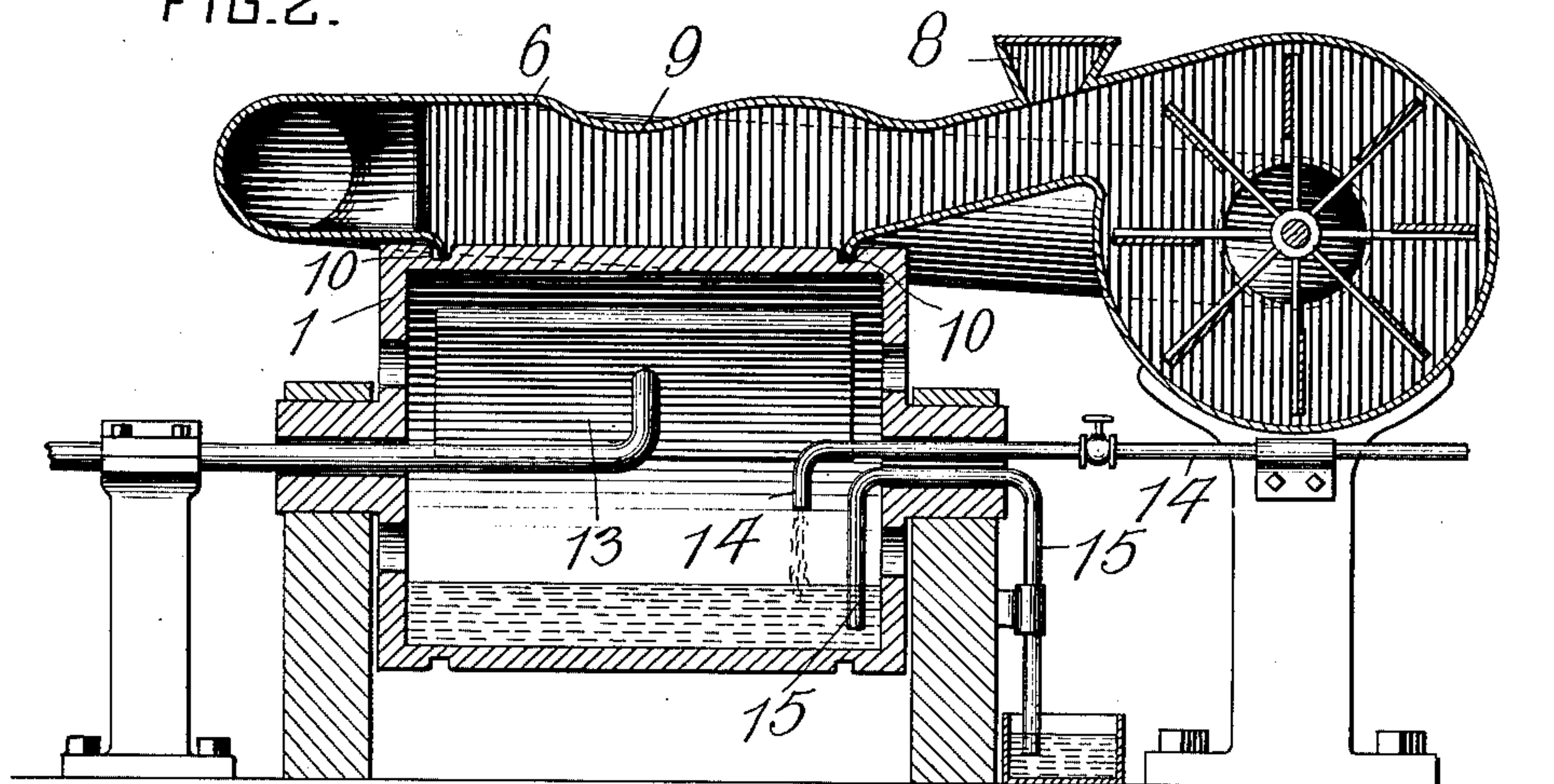
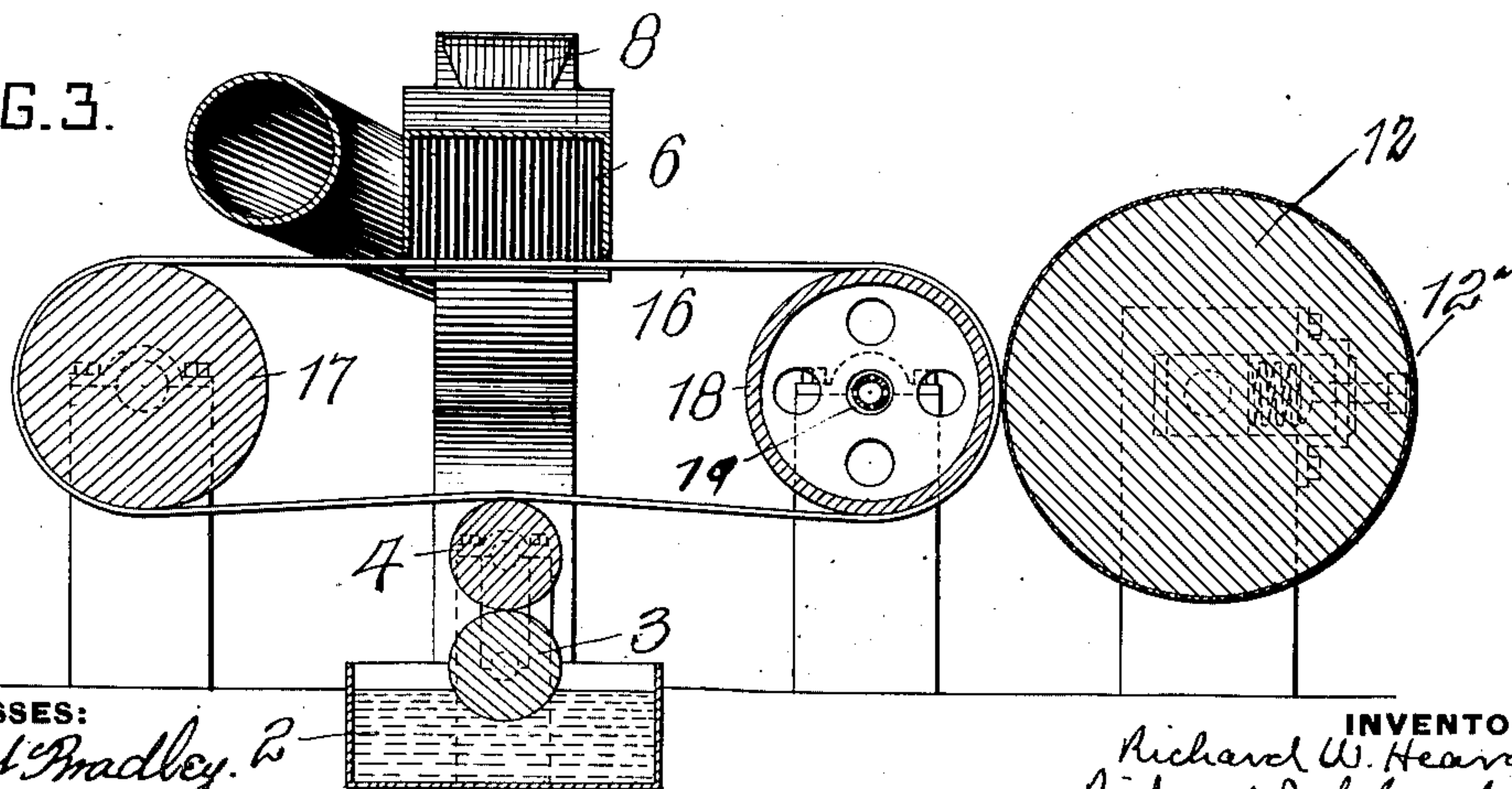


FIG. 3.



WITNESSES:
Herbert Bradley.
F. M. Dapper.

INVENTORS.
Richard W. Heard
Richard A. L. Snyder
by Darwin S. Wolcott Att'y.

UNITED STATES PATENT OFFICE.

RICHARD W. HEARD AND RICHARD A. L. SNYDER, OF PITTSBURG, PENNSYLVANIA, ASSIGNORS TO THE MICA MACHINE COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION.

PROCESS OF BUILDING UP SHEETS OF MICA.

SPECIFICATION forming part of Letters Patent No. 686,930, dated November 19, 1901.

Application filed April 24, 1901. Serial No. 57,262. (No specimens.)

To all whom it may concern:

Be it known that we, RICHARD W. HEARD and RICHARD A. L. SNYDER, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Processes of Building Up Sheets of Mica, of which improvements the following is a specification.

The invention described herein relates to certain improvements in building up mica sheets, &c., for insulating and other purposes; and the invention has for its object the production of sheets of any desired thickness which shall be uniform throughout.

The invention has for its further object the utilization of material which has heretofore been deemed useless for the purpose of making such sheets.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of a form of apparatus for the practice of our invention. Fig. 2 is a transverse section of the same on a plane indicated by the line II II, Fig. 1; and Fig. 3 is a view similar to Fig. 1 of a modification of the apparatus.

In the practice of our invention the mica is split or divided into very thin laminae, preferably by the employment of the method described and claimed in an application filed by us April 24, 1901, and serially numbered 57,261, and these laminae without regard to their superficial dimensions are bound together and formed into a sheet of uniform thickness, as hereinafter described. This method is carried out by applying a coating or layer of suitable binding material, as shellac, to a suitable supporting-surface, distributing mica scales or sheets over the prepared surface, removing the non-adherent scales, and finally pressing the adherent scales or sheets onto the prepared surface. The two last steps may be reversed—that is, pressure may be applied after the scales have been deposited and then such scales or sheets as do not adhere may be removed. A desirable

way of forming these sheets from the mica scales is shown in Figs. 1 and 2, and consists of a drum 1, provided with journals at its ends, mounted in suitable bearings. At one side of the drum is arranged a basin 2, containing shellac or other suitable binding material, and a small roller 3 is so mounted that a portion of its periphery is immersed in the shellac. One, two, or more distributing-rollers 4 and 5 are preferably interposed between the roller 3 and the drum 1, the last roller of the series, as 5, being in contact with the drum. The drum and rollers are revolved by any suitable means, and by the operation of the evening or distributing rollers a thin skin or coating of shellac is deposited on the periphery of the drum. A depositing and distributing box 6, having its under side open, is arranged in suitable proximity to the drum and extends along its periphery parallel, or approximately so, to the axis of the drum. One end of this box is connected to the discharge-outlet of a fan or other suitable blowing apparatus, and the opposite end is connected to the inlet of such blowing apparatus, so that a circulation of the air is effected through the box and across the surface of the drum. The mica scales or sheets are fed into the air-circuit through a hopper 8, of any suitable construction, so that they will be carried along with the air as it moves in its circuit and deposited on the shellacked surface of the drum. The depositing and distributing box and its outlet may be made somewhat larger than the inlet-pipe to the box, so that there will be, if necessary, a diminution in the speed of flow of the air and mica within the box, thereby allowing the deposit of some of the mica scales on the shellac surface of the drum and enough to give it a scale-like coating. It is preferred that the mica-distributing apparatus should be so arranged that the scales as they enter the box are directed onto this shellac surface. If desired, a deflecting-surface 9 may be arranged within the distributing-box for this purpose. In order to prevent a material escape of the mica scale, the ends of the distributing-box project into grooves 10, formed in the periphery of

the drum 1, and the lower edges on the sides of the box are brought down into close proximity to the drum. While the shellac surface is passing along the open bottom of the box it will be completely covered with mica scales and all superfluous or non-adherent scales will be carried away by the air. Preferably as little shellac is used as is consistent with the formation of a good bond between the scales, so that the film of shellac and mica scales is very thin, and two or more such films are laid on each other to produce a serviceable sheet or as thick a sheet as may be desired. It is not desirable to form the successive sheet by successive layers one upon the other on the drum 1 by successive revolutions thereof, as some of the scales would probably adhere to the distributing-roller 5. Hence provision is made for the transfer of each film as formed to a building-up surface on the perimeter of a drum 12. The drum 12 is made of any suitable diameter, dependent upon the length of the sheet which it is desired to form, and is mounted in suitable bearings so arranged that the periphery of the drum 12 will bear yieldingly against the drum 1, so that the sheet or film of mica and binder will be compressed somewhat between these drums. To this end the adhesion of the binder to the surface of the drum 1 is reduced or destroyed, but without destroying its continuity, thereby permitting of the transfer of the film with the scales thereon to the surface of the drum 12. The formation of the film and its transfer to the drum 12 is continued until a desired thickness is formed on the drum 12. The adhesion of the film to the drum 1 can be conveniently lessened or destroyed by heat, which can be applied to the rim of the drum 1 at any point between the distributing-box and the line of contact of the drums 1 and 12 by a properly-regulated burner 13. In order to insure the adherence of the film to the drum 12, a thin coating of shellac or other binder is applied to the surface thereof, preferably by running the mechanism described a short time before depositing mica scales or sheets on the drum 1. By this operation a thin coating of binders will be applied to the drum 12 by the drum 1. The heat applied to the perimeter of the drum 1 reduces the adherence of the film of mica and binder thereto, so that such film will adhere to the drum 12, thereby effecting a stripping of the film from the drum 1.

While the sheet formed or built up on the drum 12 can be removed by heating the latter sufficiently to lessen the adherence of the inner or primary coat of binder and then slipping the sheet off, such operation would require considerable time. It is therefore preferred to cover the drum 12 with paper or cloth 12^a and build up the sheet of mica thereon. The compound sheet can then be removed by cutting the built sheet on a line parallel with the axis of the drum and removing the sheet. The paper or cloth back

can subsequently be removed by heating that side to reduce or lessen the adherence of the cloth or paper to the built-up sheet and then removing the cloth or paper.

It is preferred that the perimeter of the drum 1 should be cool when the shellac is applied. To insure this, provision is made for cooling the drum after the film has been removed. A convenient means to this end consists in maintaining a cool body of water in the lower portion of the drum. This may be accomplished by inserting a feed-pipe 14 and one leg of a siphon 15 through an opening in the journal of the drum. The flow of water through the pipe 14 and siphon is so regulated as to maintain a sufficient body of water in the drum at all times.

In Fig. 3 a belt 16, passing around drums 17 and 18, is substituted for the drum 1. The binder is applied to the belt in the same manner as to the drum 1, and heat is applied to the belt to lessen the adherence of the binder by heating the drum 18 by a burner 19 or other suitable means.

It frequently happens that pieces of mica, consisting of two or more laminae partially separated from each other, are deposited on the prepared surface. In such case only the laminae in contact with the prepared surface would adhere thereto and the air-blast or other means employed for removing the superfluous material would effect a complete separation of the superposed laminae from the one adhering to the surface. Hence it will be understood that under the term "removing non-adherent scales or sheets" as herein used we include not only the removal of all independent adherent scales or sheets, but also the complete separation of two or more laminae from a lamina adherent to the surface.

We claim herein as our invention—

1. As an improvement in the art of building up sheets of mica, the method herein described, which consists in applying a binder to a surface, so causing scales or sheets of mica to traverse the prepared surface, whereby scales or sheets will be distributed with approximate uniformity over the surface and the non-adherent scales or sheets removed, and then transferring the film from the surface on which it was formed to another surface, substantially as set forth.

2. As an improvement in the art of building up sheets of mica, the method herein described, which consists in applying a binder to a surface, causing scales or sheets of mica to traverse the prepared surface, whereby an even or approximately even distribution of scales or sheets on such surface is effected and the non-adherent scales or sheets removed, removing the film from the surface on which it was formed and superposing a series of two or more films on each other and subjecting them to pressure, substantially as set forth.

3. As an improvement in the art of building up mica sheets, the method herein de-

scribed, which consists in applying a binder to a surface, distributing mica scales or sheets onto the prepared surface, lessening the adherence of the film to the surface on which it is formed, causing it to adhere to another surface, separating said surfaces and thereby stripping the film from the first surface, substantially as set forth.

4. As an improvement in the art of preparing mica sheets, the method herein described, which consists in applying a binder to a moving surface as a drum, blowing mica scales or sheets across the prepared surface, heating said surface, thereby lessening the adhesion of the binder thereto, bringing the film thus formed in contact with a cooler adherent surface and separating said surfaces, whereby the film is transferred from one surface to the other, substantially as set forth.

5. As an improvement in the art of building up sheets of mica, the method herein described, which consists in applying a binder to a surface, causing a lamina of a partially-opened-up piece of mica to adhere to such prepared surface and then removing the laminae not in contact with the binder from the lamina adherent thereto, substantially as set forth.

6. As an improvement in the art of build-

ing up sheets of mica, the method herein described, which consists in applying a binder to a surface, causing laminae of partially-opened-up pieces of mica to adhere to such prepared surface, removing the laminae not in contact with the binder from the adherent laminae and then transferring the film thus formed from the surface on which it was formed to another surface, substantially as set forth.

7. As an improvement in the art of building up sheets of mica, the method herein described, which consists in applying a binder to a surface, causing a lamina of a partially-opened-up piece of mica to adhere to such prepared surface and then so directing a blast of air against the piece of mica as to cause the laminae out of contact with the binder to split off from the adherent lamina, substantially as set forth.

In testimony whereof we have hereunto set our hands.

RICHARD W. HEARD.

RICHARD A. L. SNYDER.

Witnesses:

DARWIN S. WOLCOTT,
F. E. GAITHER.