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PATENTED JAN. 22, 1907.

E. KOLBASSIEFF.

MANUFACTURE OF AN IMPERMEABLE MASS.

APPLICATION FILED AUG. 31, 1905.

Fig. 1

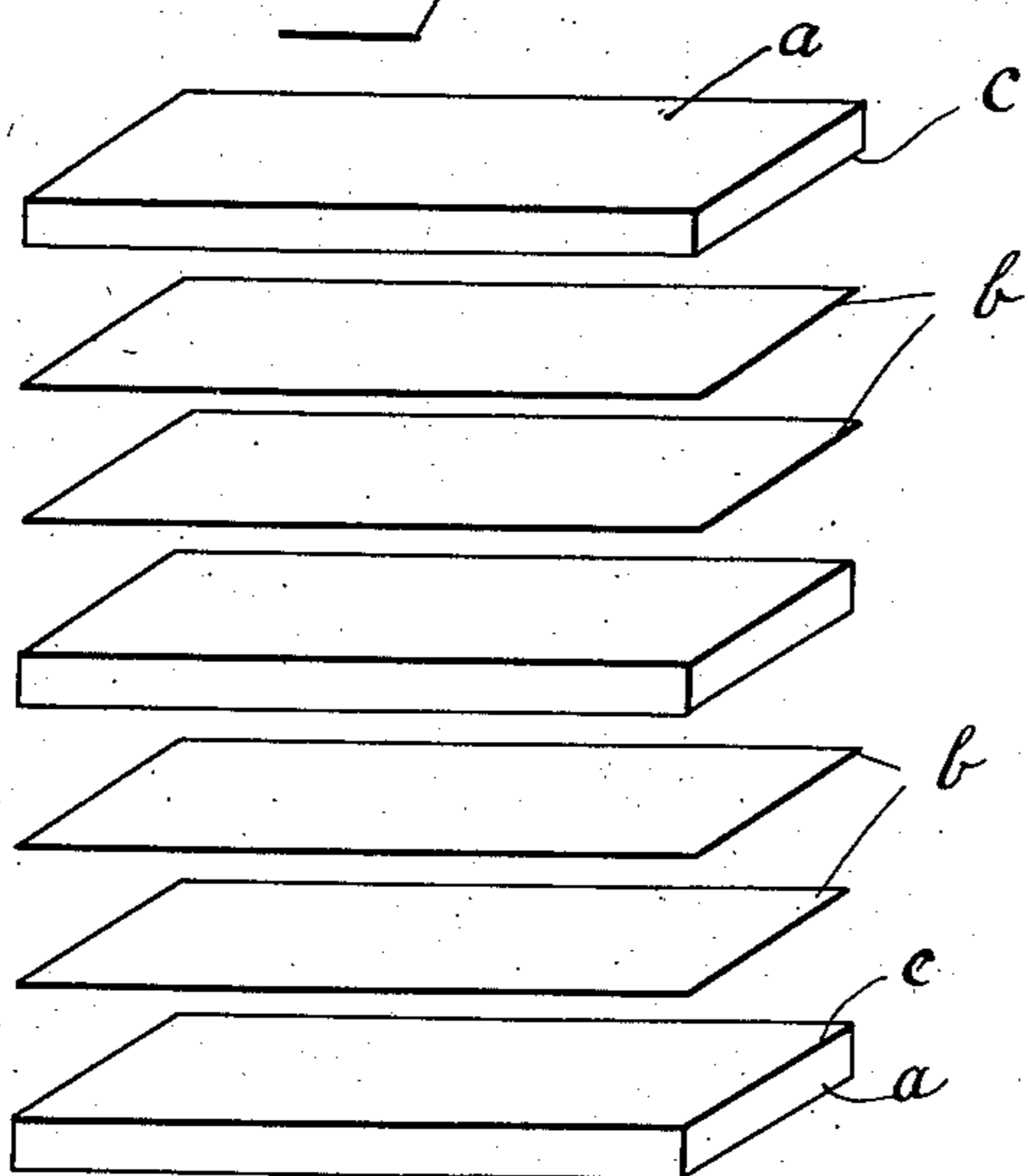


Fig. 4

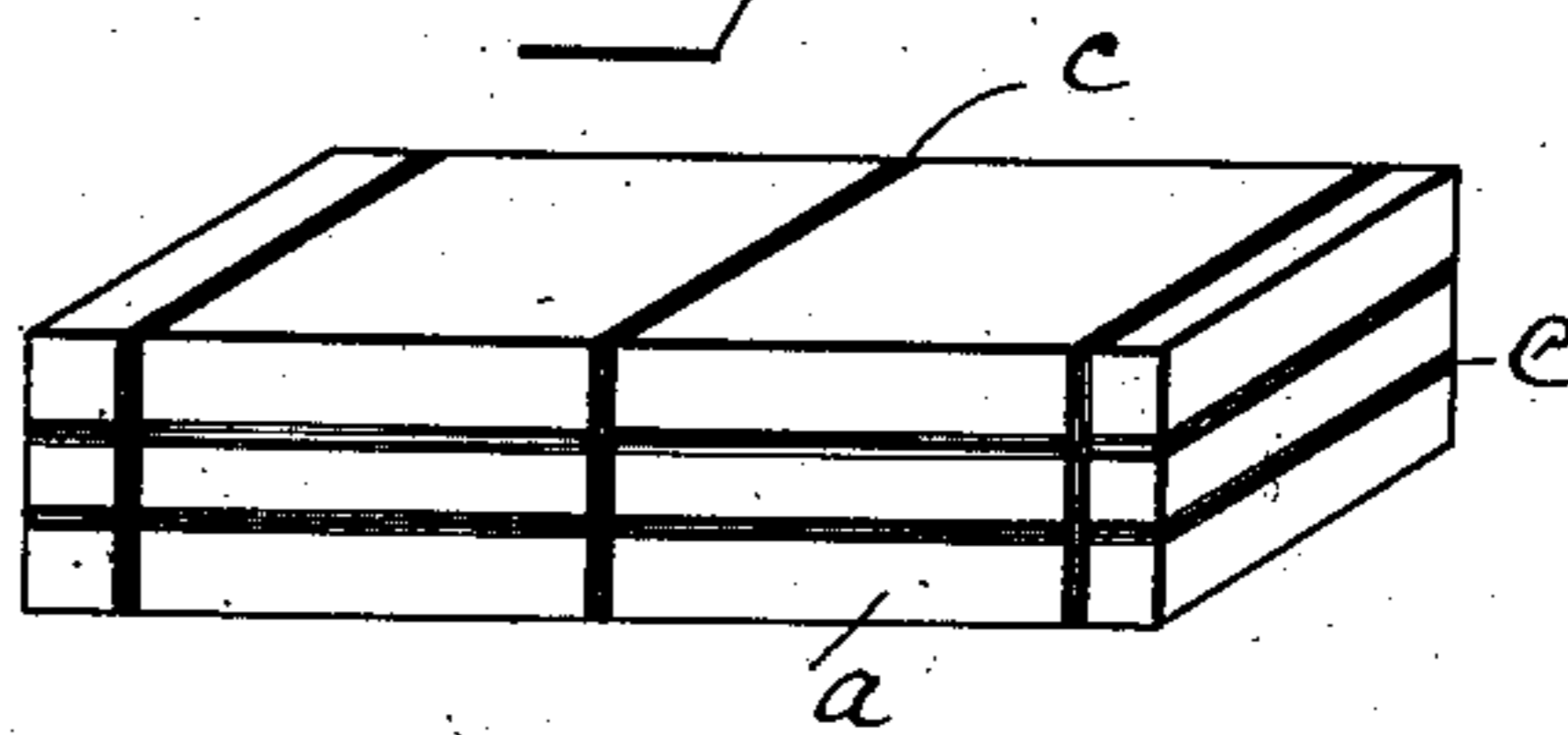


Fig. 5

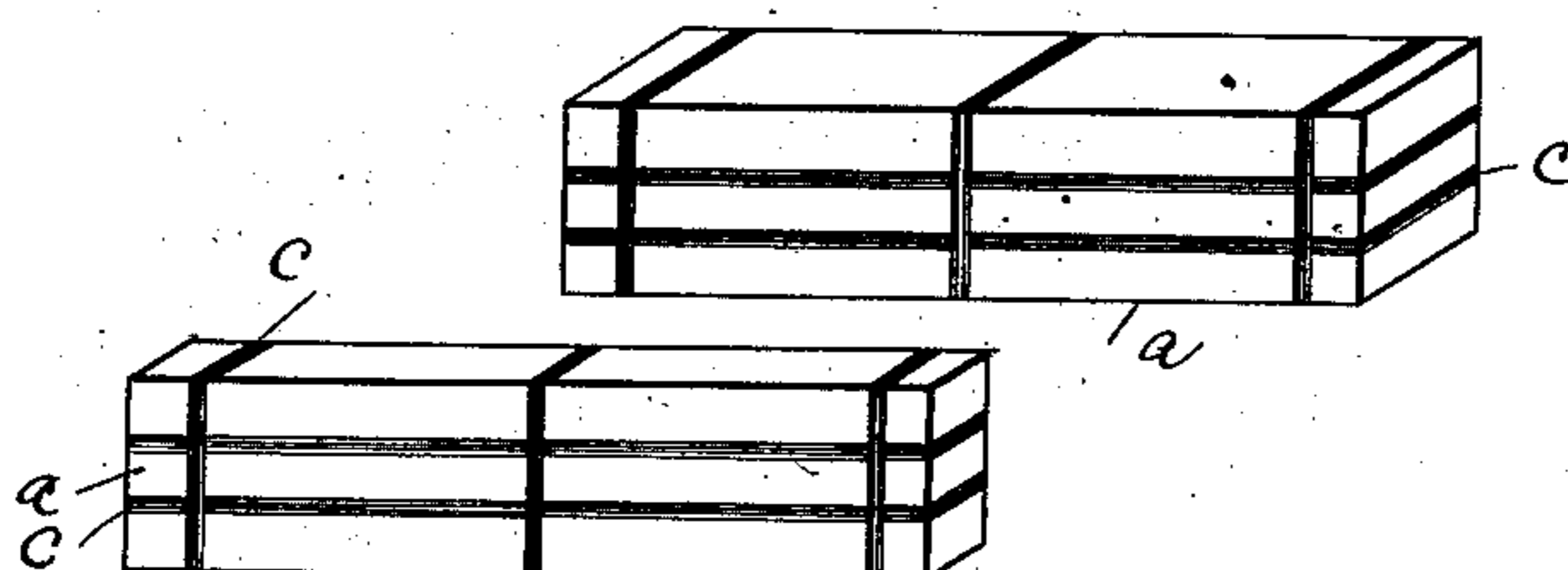
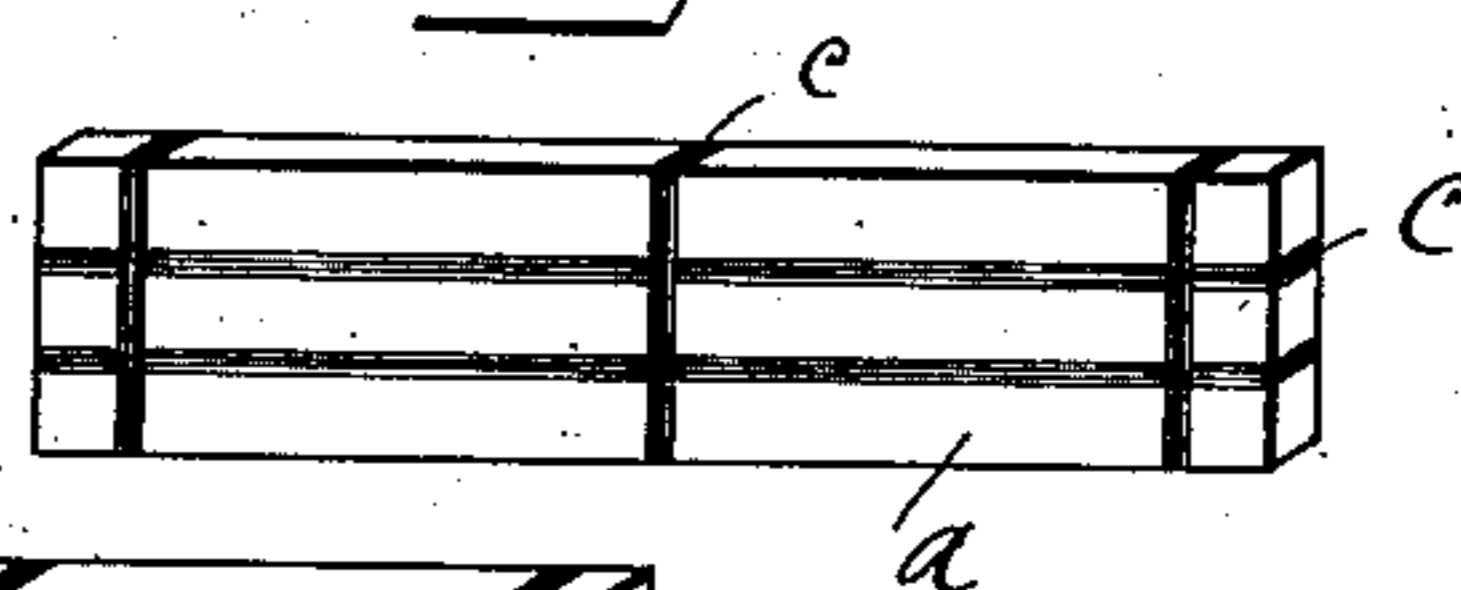


Fig. 2

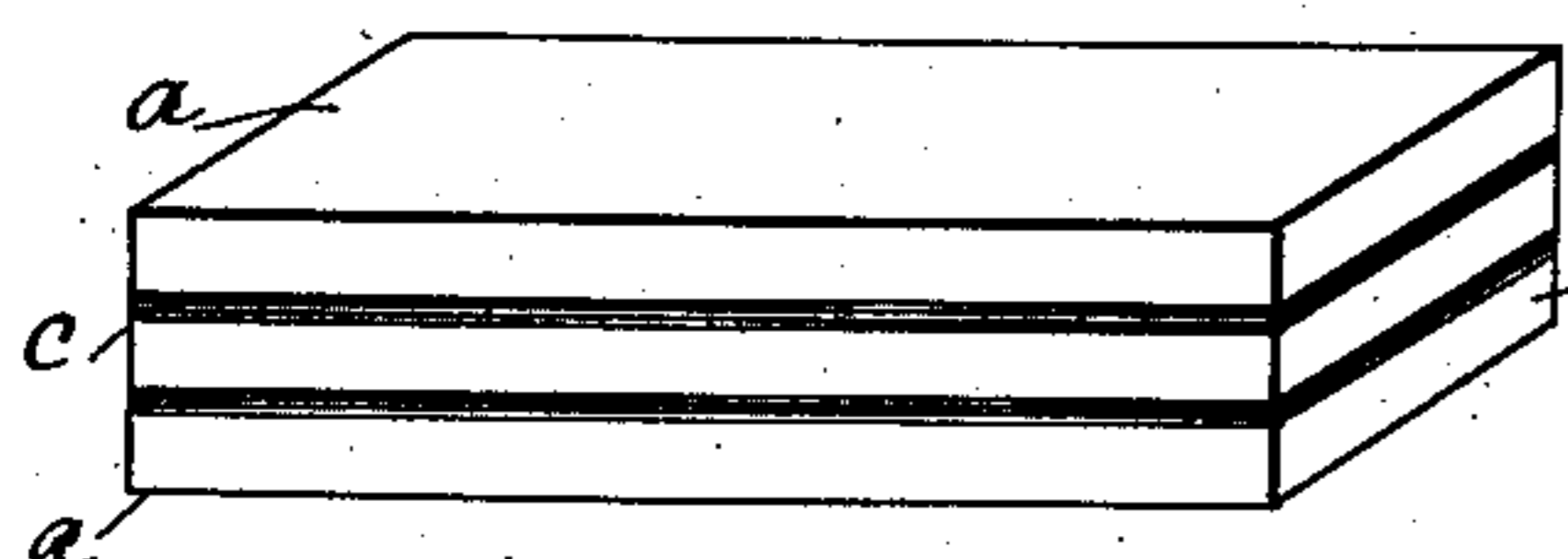


Fig. 6

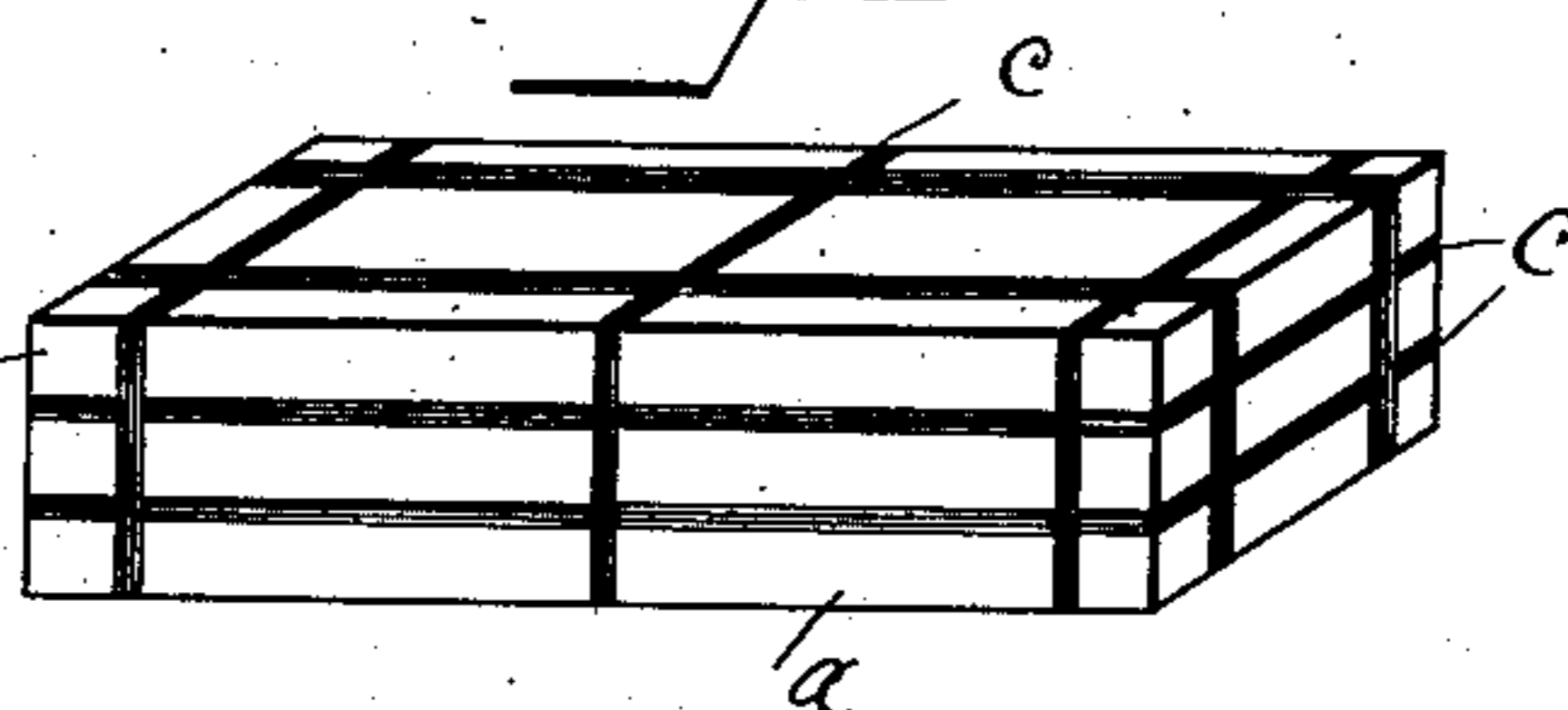
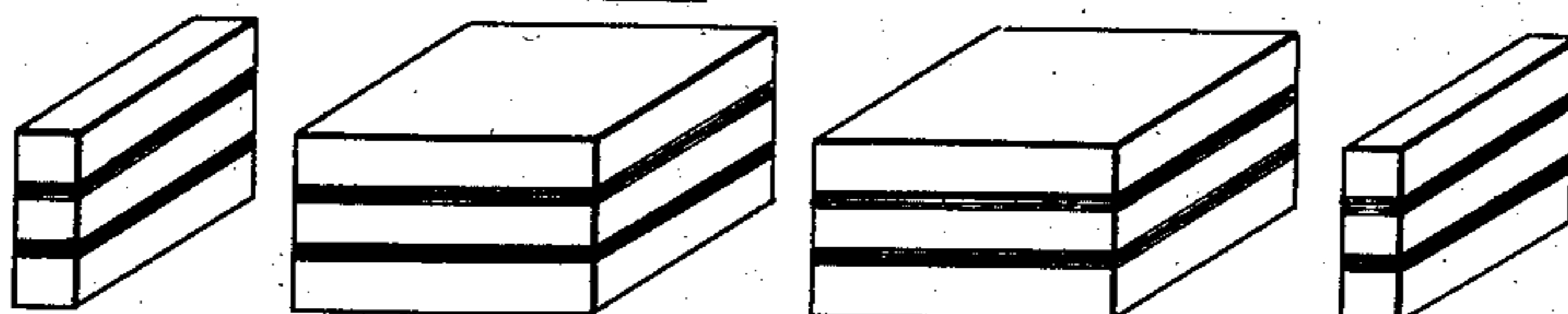


Fig. 3



Witnesses
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UNITED STATES PATENT OFFICE.

EUGENE KOLBASSIEFF, OF ST. PETERSBURG, RUSSIA.

MANUFACTURE OF AN IMPERMEABLE MASS.

No. 841,875.

Specification of Letters Patent.

Patented Jan. 22, 1907.

Application filed August 31, 1905. Serial No. 276,651.

To all whom it may concern:

Be it known that I, EUGENE KOLBASSIEFF, a subject of the Emperor of Russia, and a resident of St. Petersburg, Russia, have invented certain new and useful Improvements in the Manufacture of an Impermeable Mass, of which the following is a specification.

My invention relates to an improved method of manufacturing impermeable blocks made from cork and other material, the object of the invention being to preserve the lightness of the original material. Such blocks may be used, for instance, in the construction of coffer-dams and other structures exposed to or under the level of water. The new method consists in first immersing each piece of cork in a material or cement which is capable of coating it. The cork is then gradually coated by dipping it with two or three coats of such material, which must have the required properties of impermeability, care being taken that all air-bubbles are mechanically removed. As soon as a layer of cement or other coating material of sufficient thickness has been obtained two plates of cork thus prepared are cemented together and a block of small specific gravity thus obtained. By again cementing or coating further pieces or plates a block of any desired shape and size may be obtained, which block is placed in a case of suitable size, and some of the coating material is cast around the block.

On the accompanying drawings, Figure 1 shows a number of cork plates which have been coated and intermediate layers of paper or the like. Fig. 2 shows a block made of three such cork plates. Fig. 3 shows the same block as in Fig. 2 cut into smaller blocks. Fig. 4 shows a composite block. Fig. 5 shows the same block cut into smaller blocks; and Fig. 6 shows a block made of a number of sections, as shown in Fig. 5, the sections having been coated again.

Thin sheets of cork are first united together by means of ordinary glue, so as to form a sufficiently strong plate *a* having a thickness of twenty or thirty centimeters. These plates *a* are then immersed in molten colophony mixed with small amounts of paraffin and Syrian asphaltum, the most essential substance being colophony, asphaltum and paraffin being less important. The impregnated mass becomes hard, like wood. The addition of asphaltum causes the hard-

ness and brittleness of the mass to increase, at the same time increasing also the temperature of fusion. As the asphaltum, however, prevents the colophony from penetrating into the interior of the mass, it is not desirable to use a large amount of asphaltum. Paraffin exerts a different action on colophony, as in the presence of high temperatures the particles of colophony are rendered more movable by the paraffin and the mass becomes softer. The combination of colophony, paraffin, and asphaltum gives, properly speaking, the same results as pure colophony, though said mixture renders the composition less hygroscopic than if using colophony alone. The principal substance, however, for impregnating the cork mass is colophony, as it is hard and does not contain volatile gases. The cork plate is immersed in said composition at a temperature of 100° to 200° centigrade, it being advisable to choose the higher temperature, as in doing so the smaller cavities or pores of the cork mass are filled in with the composition. The plate is left in the composition from five to ten seconds. If it remains there a longer period of time and the impregnation is a fuller one, the specific gravity of the plate will increase, which is not desirable in general. As soon as the first layer of the cork mass becomes hard the entire plate is immersed a second time into the composition, also during from five to ten seconds. After the composition is hardened it is ironed by aid of a hot smooth iron, and all air-bulbs are removed from the surface. In case of the composition not having been laid on evenly or smoothly after the second dipping the cork plate is dipped a third time, and sometimes the dipping is further repeated until a coat of sufficient thickness is obtained. Only after the layer *c* of the composition is sufficiently thick its surface is coated with oil or fat, which is rubbed into the cavities or pores of the composition. When the layer of composition is already prepared, a sheet of paper 3 or a thin sheet of wood is put thereupon, and then it is ironed by a smooth iron. The paper in sucking from the surface of the composition the oil and fat strongly adheres to the composition and becomes impermeable. Thus is produced a whole series of cork plates which are cemented by the same composition and united to form a block, as seen in Fig. 2. It may prove necessary to add a small amount of linseed-

oil or fat or other liquid hydrocarbons not containing volatile parts in order to decrease the brittleness.

It must be observed that carbonaceous and vegetable resins, with the exception of asphaltum and colophony, will not do, so that the addition of such substances to the colophony will not be an improvement of the process. Several plates after they have been united together by said composition may be cut by a saw into smaller blocks, as shown in Fig. 3. The latter are dipped again in the same composition as formerly the plates, after which in the described manner the layers of composition are superposed and paper or wood is put thereon. The single blocks are then united again to form a new block, as seen from Fig. 4. The cemented cork block is cut in different perpendicular directions, being impregnated with the composition and coated with paper, as described. The so-prepared cork block consists, so to speak, of a series of small cork blocks separated from each other by a layer of paper and a layer of colophony, with the addition of other substances. The layers of colophony that have rendered the cork surface hard, like wood, make also the entire cork block rather resistant to external pressure and at the same time the single cork blocks or sections impermeable.

The cork blocks or sections are placed in iron cases in such a manner that the spaces between the cork and the case are not greater than two millimeters, whereafter the case is filled with the composition, beginning from the lower sections or blocks and then coming to the upper, whereby the entire block is coated. When effecting such filling in, attention must be paid to the following: Under the action of the high temperature the iron is heated and is bent, so that the composition enters in greater quantity than desired. After the cooling the iron will press the cork. Therefore it will be necessary when filling in to place a sufficiently heavy weight above the cork block so that the cork shall not be allowed to move from its place. The composition used for filling in is again colophony, but mixed with oil, fat, and paraffin. The most suitable proportions will be as follows: twenty parts of colophony, one part of fat, one part of linseed-oil, and two parts of paraffin. A small amount of asphaltum may also be added, though it is practically immaterial. If the amount of paraffin is increased, the composition becomes more adhesive or sticky, more amorphous, and more impermeable, while the linseed-oil and the fat, while

not destroying the stickiness of the composition, render it softer. It is, however, not advisable to use a composition which proves to be too soft, as in such a case the layers between the cork plates become also softer and the cork mass will not be able to stand the external pressure. The admixture of carbonaceous and vegetable resins is rather injurious, most of them containing a considerable amount of volatile gases.

I may mention that the cork plates may be replaced by plates prepared from wood—for instance, of the aloe group and others showing a small specific gravity.

I claim as my invention—

1. An impermeable mass composed of cork plates, cemented together from thin cork sheets and coated with layers of a composition made of molten colophony at 100° to 200° centigrade, and a small amount of asphaltum and paraffin, and of ordinary paper impregnated with the said composition and fat and placed on the said cork plates.

2. An impermeable mass composed of thick cork plates cemented from thin cork sheets and coated with layers of a composition made of molten colophony at 100° to 200° centigrade, and a small amount of asphaltum and paraffin, fat being rubbed in the said layers, and of ordinary paper placed on the cork plates and impregnated with the composition and fat being rubbed in the cork plates, the aforesaid composition being mixed with liquid hydrocarbons containing no volatile parts for cementing the cork plates together.

3. A method of manufacturing the improved impermeable mass from cork consisting in uniting together thin cork sheets by means of glue, dipping said united cork sheets for five or ten seconds in a bath made of molten colophony at 100° to 200° centigrade and of a small amount of asphaltum and paraffin, then rubbing fat in the layers of the composition, placing sheets of ordinary paper on the thus-treated cork plates, cementing several cork plates together by means of the aforesaid composition with the addition of a small amount of linseed-oil, cutting them into sections, coating the said sections, arranging them in cases and filling them in with a composition consisting of colophony, fat, linseed-oil and paraffin.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EUGENE KOLBASSIEFF.

Witnesses:

N. D. FOMEIN,
N. TSCHENALOFF.