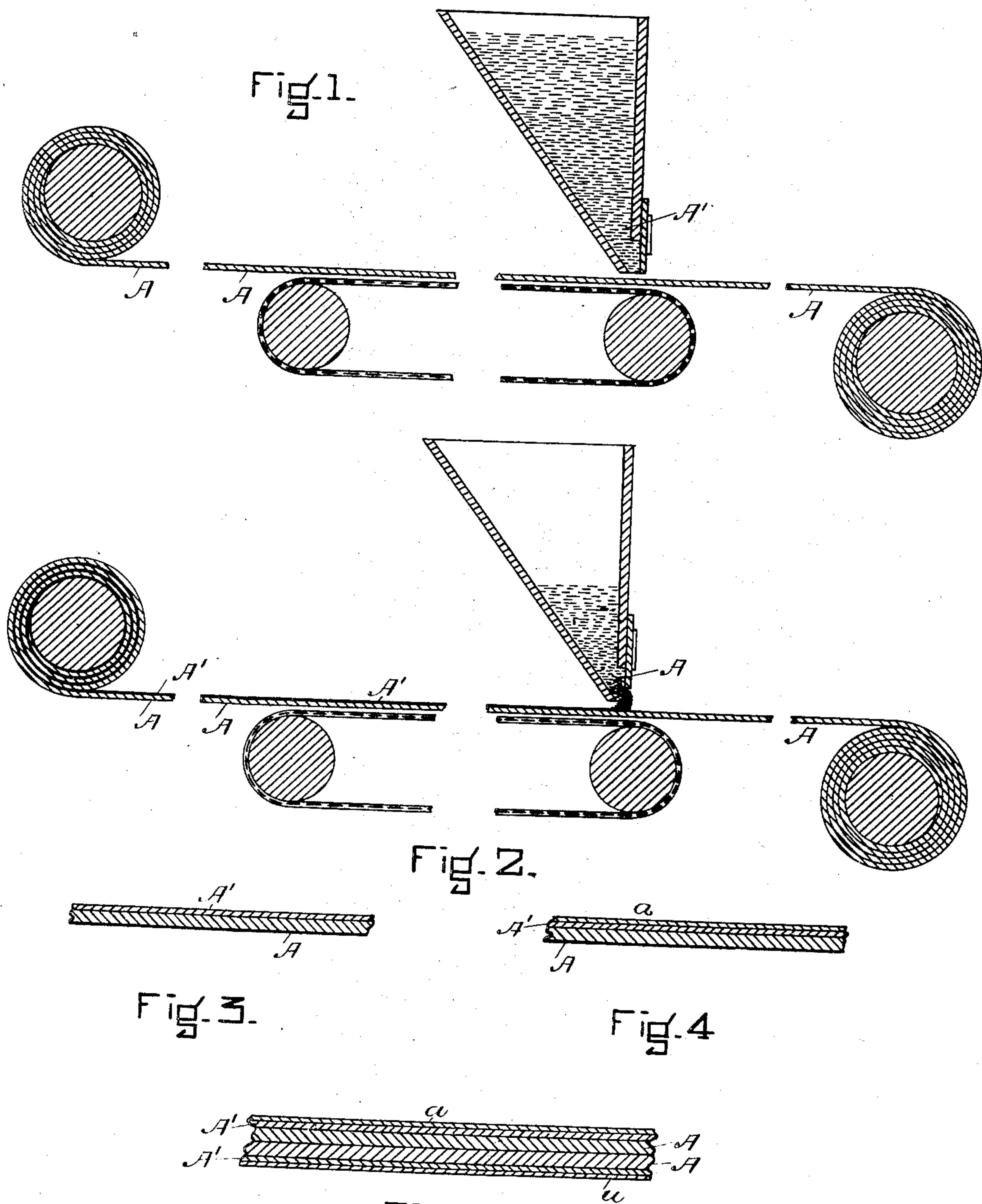


(No Model.)

J. G. MERRILL.
FIRE PROOF PAPER OR BOARD.

No. 367,424.

Patented Aug. 2, 1887.



WITNESSES

J. M. Dolan.
Fred. B. Dolan.

Fig. 5.

INVENTOR
Jonathan G. Merrill
by his atty
Charles Raymond.

UNITED STATES PATENT OFFICE.

JONATHAN G. MERRILL, OF QUINCY, ASSIGNOR OF ONE-HALF TO MOODY MERRILL, OF BOSTON, MASSACHUSETTS.

FIRE-PROOF PAPER OR BOARD.

SPECIFICATION forming part of Letters Patent No. 367,424, dated August 2, 1887.

Application filed July 26, 1886. Serial No. 209,045. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN G. MERRILL, of Quincy, in the county of Norfolk and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Fire-Proof Paper or Board, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to a fire-proof board or paper comprising a base or body of paper or board material, and a layer or coating of asbestos or other fire-resisting material applied to the first-named body or layer at the time that it is manufactured, so that the manufactured article when completed comprises a base or layer of one fire-resisting material surface covered with a layer or coating of another material of a greater fire-resisting quality.

In the drawings, Figure 1 represents in section a part of a paper-making machine, showing the base or body of the fire-proof material passing through it. Fig. 2 is a view also showing in section a part of the paper-making machine, and illustrating the application to or incorporation with the base of the coating or layer of asbestos. Fig. 3 represents a view of the complete product. Figs. 4 and 5 show the product treated with coatings of the silicate of soda, as hereinafter specified.

I use in making this compound paper or board ordinary paper-making machinery, and I first make in the machine the layer or base section of the compound paper or board. I may use in making this any suitable composition employed in making cheap paper or boards, but prefer to use one that shall have greater fire-resisting properties than those generally used, and I prefer a mixture or composition containing about sixty per cent. vegetable fiber, twenty per cent. asbestos, ten per cent. alum or copperas, and ten per cent. coloring-matter, preferably plumbago or lampblack or Venetian red. These ingredients are intimately mixed or incorporated together. This composition is then run through the paper-machine in the ordinary way; but instead of passing through the driers it is rolled and immediately passed through the machine again,

and upon the second passage of this base or layer a composition having greater fire-resisting qualities is fed therein by suitable devices and united thereto by the paper-making machinery, it being spread thereon and fed thereto in the same manner that it would be formed or made into a web of paper. The compound paper thus made is then passed through rolls and dried, and the paper is ready for any subsequent treatment.

The composition which I prefer to employ for furnishing the higher fire-resisting property comprises asbestos mixed with sufficient glue, starch, or other similar ingredient to keep it together while it is being applied; but from its nature it is obvious that it does not possess the strength that the first-named composition, or composition for forming the base or first layer, possesses. It will therefore be seen that I obtain by the first layer principally strength, and by the second layer principally high fire or heat resisting or protecting properties, which, being intimately joined to the first layer, is held, supported, and sustained thereby, so that a very strong, solid, durable, and cheap product is obtained. After the compound paper has thus been made it may be further subjected to other treatment to increase its fire-resisting properties—such, for instance, as coating one or both of its surfaces with silicate of soda, or by arranging the paper in two or more layers and uniting them by silicate of soda. When a board or paper of two layers or pieces is made, I prefer to arrange them so that the surfaces having the greater fire-resisting property shall come upon the outside.

In Fig. 2 I have represented a small section of a paper-making machine representing the first section or part of the compound paper as having been made and rolled, and being again moved through the machine to be united with the second layer, or the higher fire-resisting material; and A represents this first-named layer and A' the second-named layer.

In Fig. 4, *a'* represents a coating of silicate of soda applied to the second layer of the compound paper or board A'.

In Fig. 5 I have represented two pieces of the compound paper or board secured together

... back to back, and having
silicate-of-soda faces. This compound paper
or board is applicable as a protection from
fire or high heat, and to this end buildings,
5 apartments, rooms, or articles may be coated
therewith.

It is manifest that the proportions given
herein may be modified without departing
from the spirit of the invention, and that there
10 are many equivalent materials which may be
used for those herein named; and I prefer to,
in some instances, mix talc or powdered chalk
with the silicate of soda, and in other instances
chloride of zinc; but whichever materials are
15 employed in making this compound paper or
board, the base should be made of a fire-resist-
ing composition, and the covering should be
made of a fire-protecting composition—that is,
a composition that shall form, when submitted

to great heat, a continuous layer that shall 20
protect the fire-resisting material which it
coats.

Having thus fully described my invention,
I claim and desire to secure by Letters Pat-
ent of the United States—

The process of making compound fire or 25
heat resisting paper or board, consisting, first,
in making a web of paper or paper-like mate-
rial, but not drying the same, and, second,
immediately returning it through the mill, and
at that time incorporating therewith or form- 30
ing thereon a second web of heat or fire resist-
ing material, substantially as described.

JONATHAN G. MERRILL.

Witnesses:

F. F. RAYMOND, 2d,

FRED. B. DOLAN.