

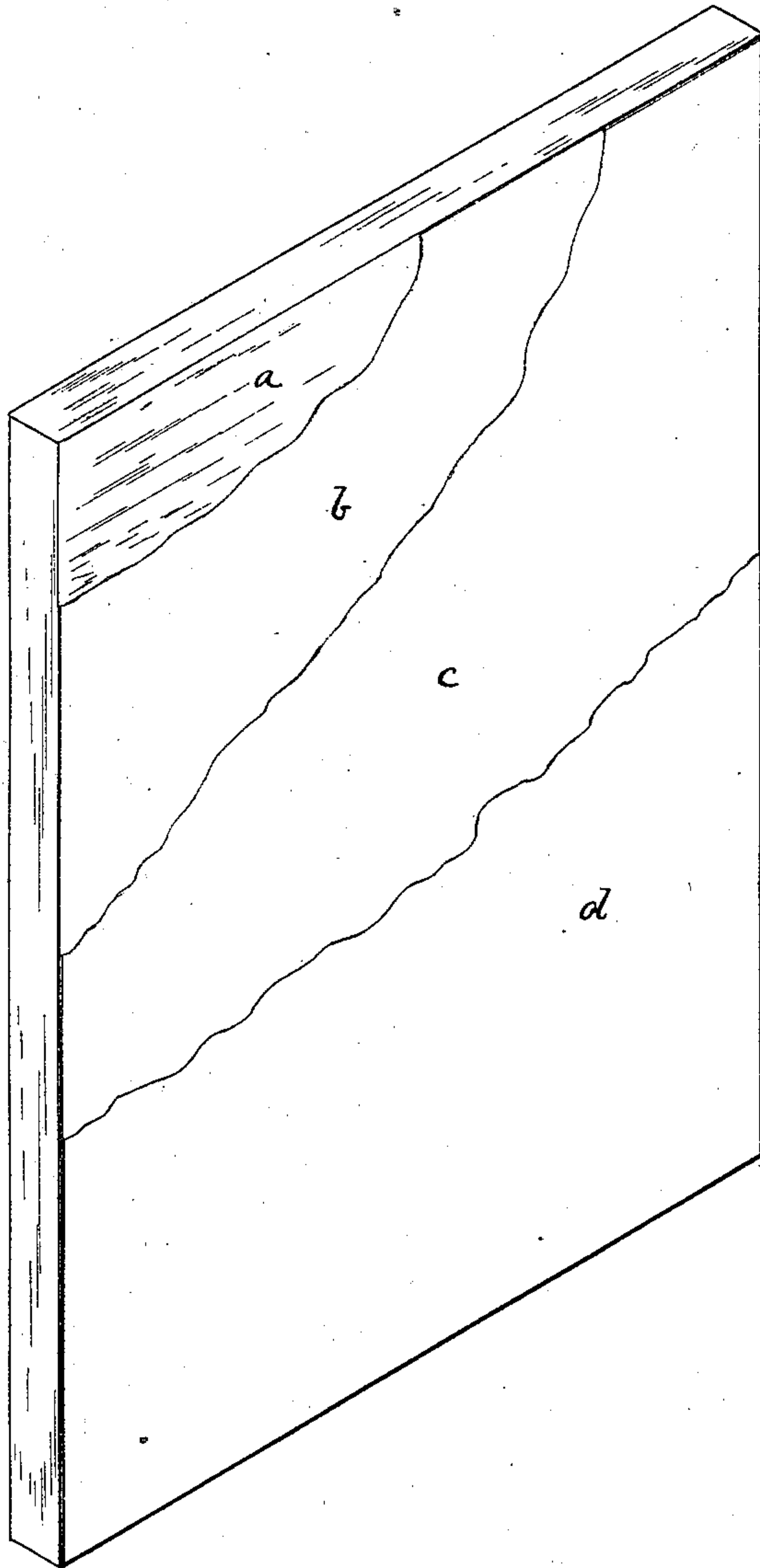
(No Model.)

J. M. CONROY & F. E. YOUNGS.

GLASS MIRROR.

No. 290,744.

Patented Dec. 25, 1883.



Witnesses.

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# UNITED STATES PATENT OFFICE.

JOHN M. CONROY AND FRED E. YOUNGS, OF ALLEGHENY, PENNSYLVANIA.

## GLASS MIRROR.

SPECIFICATION forming part of Letters Patent No. 290,744, dated December 25, 1883.

Application filed August 18, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN M. CONROY and FRED E. YOUNGS, of the city of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Glass Mirrors; and we do hereby declare the following to be a full, clear, and exact description thereof.

The silver deposited on the surface of sheets or plates of glass, for the purpose of making mirrors, is very apt to suffer injury by mechanical abrasion, and also by oxidation from the access of the atmosphere. In order to protect the silvered surface from being defaced by either of these causes, it has been suggested to coat the silvered surface of the glass with a thin film of copper deposited on the silver by the electrotpe process; but this method, although affording a certain degree of protection, is liable to two serious objections, either of which renders it practically useless. The first of these is that the contact of the two metals causes a galvanic action to be established, which in process of time causes the silver to be so acted upon as to destroy the smoothness of its surface, and thus render it useless as a mirror; and the other is that, owing to the different degrees of expansibility by heat of copper and silver, the continuity of surface of the silver is broken up by the formation of minute cracks, with a like injurious effect on the mirror. In both cases, also, the mirror becomes spotted and discolored, owing to the access of oxygen, and in some localities of sulphur, to the surface of the silver in contact with the glass. Another method which has been proposed is to coat the outer surface of the silver with a film or succession of films of varnish, paint, or like substances; but this is liable to the objection that these substances will gradually shrink and crack and expose the silver to the oxidizing effect of the atmosphere.

The method of protecting the silvered surfaces of mirrors which we have invented is designed to obviate these defects by coating the outer surface of the silver, after it has been deposited upon the glass, with a thin film of wax, paint, varnish, or similar substance, and then applying an exterior coating of metal, by which means we not only protect the silver deposited on the glass from being

attacked by the oxygen and sulphur in the atmosphere, but also obviate the injurious effects resulting from the immediate contact with the silver of another metal.

In order to enable our invention to be used by others skilled in the art, we will proceed more fully to describe the method by which we carry it into effect.

The glass having been first coated with silver by any of the methods used for that purpose, a thin film of wax, varnish, paint, or similar substance is applied, the manner of its application depending on the substance used. For this purpose it is desirable to use a substance which contains as little oxygen as possible. Beeswax or any of the vegetable or mineral waxes may be employed, in which case the plate-glass may be heated in any convenient manner to a sufficient degree to melt the wax, which is then gently rubbed over the surface of the silver until it is uniformly coated therewith.

In place of wax, any suitable paint or varnish may be used, or the viscous residuum of the distillation of petroleum, which, if reduced to a sufficient degree of consistency, is desirable as being free from oxygen. Before the film thus applied becomes hard a thin leaf of metallic foil is placed evenly on the surface of the plate, over the film of wax or other substance, and is pressed down closely by means of a roller, brush, or otherwise, so as to form a close union between the foil and the film of wax or other substance, and to exclude all bubbles of air.

If the inner coating is made of wax or other substance which will become, when cold or dry, sufficiently hard to permit of it, the outer or metallic coating may be applied by first coating the surface of the wax, &c., with plumbago, and then depositing a film of copper, tin, or other metal by means of the electrotpe process in the well-known method; or, if preferred, the metallic coating may be applied by means of foil—such as tin-foil—or of paper coated with silver or other metal, in which case we prefer to apply the metallic surface of the paper to the surface of the inner coating.

Having thus described our improvement, what we claim as our invention, and desire to secure by Letters Patent, is—

1. The method hereinbefore described of



protecting the silvered surface of mirrors from abrasion and atmospheric action by applying to the exterior surface of the silver an inner coating of wax or other suitable substance and  
5 an outer coating of metal, substantially as and for the purpose described.

2. As a new article of manufacture, silvered glass mirrors having on the silvered surface an inner coating of wax or other similar sub-  
10 stance impervious to the atmosphere and an

outer coating of metal, substantially as described.

In testimony whereof we have hereunto set our hands this 15th day of August, A.D. 1883.

JOHN M. CONROY.  
FRED E. YOUNGS.

Witnesses:

THOMAS W. BAKEWELL,  
W. B. CORWIN.