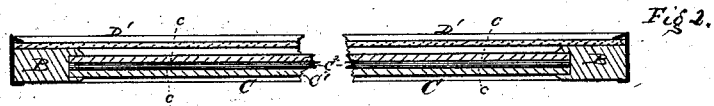
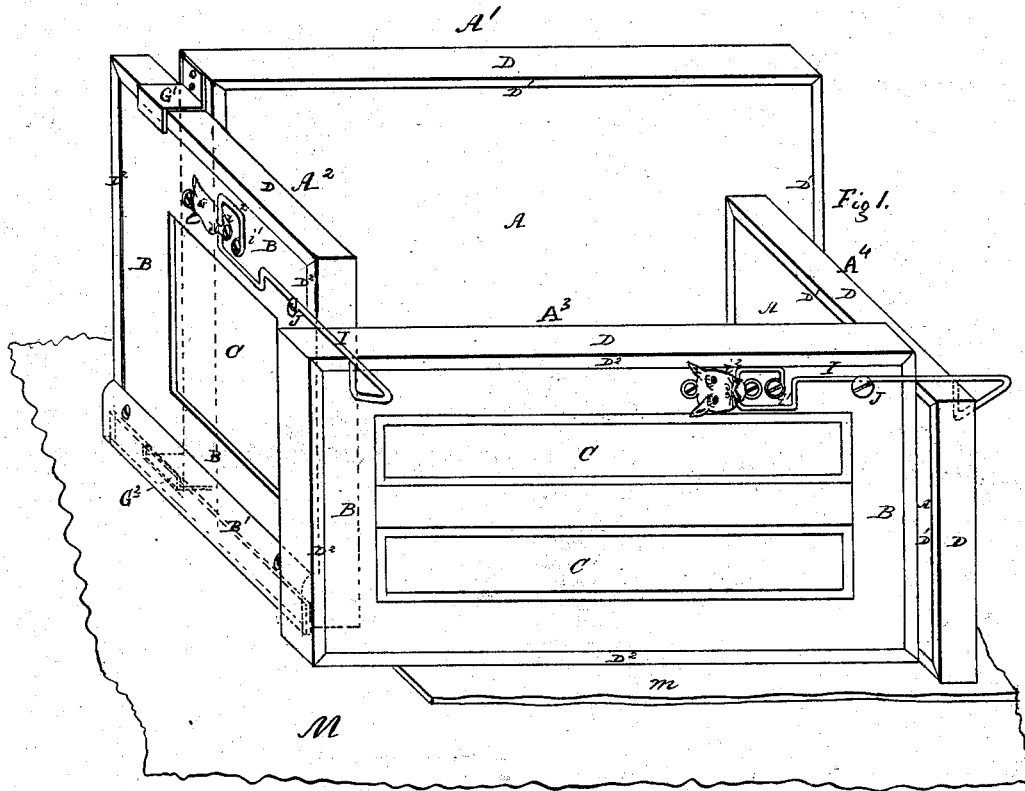


L. G. FRANCIS.
 Multiplying Mirror for Exhibiting Samples.
 No. 205,375. Patented June 25, 1878.



Witnesses: _____
 W. C. Brooks
 H. A. Johnstone.

Inventor: _____
 L. G. Francis
 by his attorney
 J. L. Weston

UNITED STATES PATENT OFFICE.

LEWIS G. FRANCIS, OF NEW YORK, N. Y.

IMPROVEMENT IN MULTIPLYING-MIRRORS FOR EXHIBITING SAMPLES.

Specification forming part of Letters Patent No. **205,375**, dated June 25, 1878; application filed May 28, 1878.

To all whom it may concern:

Be it known that I, LEWIS G. FRANCIS, of New York city, in the State of New York, have invented certain new and useful Improvements relating to Multiplying-Mirrors for Displaying Carpets and Analogous Goods; and I do hereby declare that the following is a full and exact description thereof.

Previous to my invention there had been devised the employment of four mirrors applied together to form a rectangle. The dimensions of each in either direction may be varied by adjusting the mirrors relatively to each other. I employ the same arrangement. Such mirrors had also been provided with rigid backs, serving as guards to protect the delicate coating of the glass. Springs had also been employed in engaging the mirrors together. I employ all these.

I have introduced improvements beyond anything before known to me in the construction of the backs, and in the engaging of the several mirrors together.

The following is a description of what I consider the best means of carrying out my invention.

The accompanying drawings form a part of this specification.

Figure 1 is a perspective view of the apparatus complete in position for use; and Fig. 2 is a horizontal section through one of the mirrors, with its peculiar back and binding.

Similar letters of reference indicate like parts in both the figures.

One of the difficulties which my invention is intended to overcome lies in the tendency of the backs to warp, and, by slightly springing the glass, to distort the image. It is essential to the correct action of the apparatus that the several glasses shall be perfectly plane. The thick pasteboard or tar-board heretofore employed for the backs, while affording satisfactory protection to the silvered surface of the glass, were open to the objection that they would shrink and swell with changes in the moisture in the atmosphere. In practice, this difficulty was very serious, causing, in many cases, such distortion of the glass as to render the apparatus useless.

I construct the main body of the back of cross-glued veneers, or analogous thin layers of

well-seasoned wood. The wood should be well seasoned, and saturated with thin glue. Being then firmly glued together with strong glue, in such positions that the grain of one layer lies crosswise of the grain of the next, a back is produced which is nearly or quite unaffected by atmospheric changes.

As a further safeguard against distortion, I mount the main body of each back as a panel in a hollow frame of sound and reliable wood. This frame forms the edge of each back, while the panel formed of cross-glued veneers forms the main body, and is so inserted in a groove in the inner face of the frame that it may shrink and swell without affecting the frame.

In the drawings, A is the glass, and B C the back. The frame, which extends around the edge of the back, is denoted by B, while the main body of the back is denoted by C. This latter (the main body) is composed of several layers, which will be indicated, when necessary, by the further marks C¹ C², &c. They are held firmly together by thin layers of strong glue, c.

A binding of metal, D, surrounds the exterior of each frame, and is formed with a lip, D¹, extending inward to embrace the edge of the glass, and a lip, D², extending inward to embrace the frame B of the back. This holds the glass and backing strongly together, but with liberty to move a little to allow for expansion and contraction.

I propose, in some cases, to make the frame B with one or more cross-bars, and to divide the main body C into a corresponding number of smaller panels. I have represented one of the mirrors as thus backed with two panels in the back; but one alone may suffice.

Some of the benefits of my invention can be realized by the use of the cross-glued material C without the surrounding frame B.

One glass is bolted firmly to the table in an exactly upright position. This is done by the aid of knees or brackets, which are rigidly secured by screws to the back of the glass, and to the floor, table, or supporting-platform, (represented by M.) I take care that the first or principal mirror, and also the adjacent mirrors on the left, shall have the glass held a little above the table by the extension of the back downward. This allows the edge of the

carpet *m* to be thrust a little under the glass, in order to get the pattern in exactly the right position. I prefer to extend the back down by a separate piece bolted on, as indicated by B¹. The other two mirrors will ordinarily be removed and replaced at each operation, to facilitate the removal of the carpet and the introduction of a new pattern. The backs of these mirrors should not extend down below the glass. The back should terminate even with the bottom of the mirror, and the whole should rest on the carpet, *m*, which is being exhibited. The sample of carpet will ordinarily be larger than the area included within the rectangle formed by the mirrors, and will extend out under these removable mirrors.

I will designate the several mirrors by the marks A¹ A² A³ A⁴. A¹ is fixed to the table. A² is supported by A¹, and need not, except at rare intervals, be removed altogether. It should be always in position, and always at right angles to the mirror A¹; but it is important that it be adjusted relatively thereto—that is to say, to be capable of being slid endwise.

I provide the mirror A¹ with not only a top hook, G¹, adapted to engage the upper edge of the mirror A² with its back, but also with a bottom hook, G², which embraces the lower edge of the mirror A². A sufficient recess is provided under the additional piece B¹ to allow for the hook G², so that the mirror A² may be slid forward and backward to any desired extent. These hooks G¹ G² may be rigidly fixed to the mirror A¹.

I I are spring-catches, formed as represented, and permanently attached to the backs of the mirrors A² and A³ in the positions represented. They are held by fastenings *i*¹ *i*², set in such position that each spring-catch tends to press downward below its working point. J is a stop, which holds it firmly against pressing downward too far.

The spring-catch I is always ready to rise to the required extent to engage with the next mirror on its being presented, and, being beveled, as shown, allows such next mirror to be presented by a movement facewise, instead of requiring it to be presented by a lateral movement. After it is engaged it may be adjusted by a lateral movement, as will be obvious.

When it is desired to separate the mirrors they may be removed by either a motion endwise or facewise. For the latter motion it is simply necessary to raise the catch I by the thumb while holding the adjacent glass with the fingers.

I attach much importance to these spring-catches, and to the fact that they are attached, as shown, in a convenient position to allow the mirrors to be joined by a movement facewise. It is of great importance, in showing a lot of samples by this invention, that the operator be able to effect the required changes easily and rapidly. The permanence of the attachment of the catches is not only an assurance against their becoming lost, but greatly promotes the strength and capacity for rapid and reliable operation. Modifications may be made. It is not essential that the catches I be coiled around, or partially around, as shown. It is not essential that the fastening *i*² be made, as shown, in the form of a casting screwed on the back; but I esteem such the preferable construction.

The binding metal D may be extended inward on the back B to any extent which convenience may require. I esteem it important only to sufficiently guard the back against abrasion by the respective catches I and hooks G¹ G². The binding D may also extend forward on the face of the glass to a greater or less extent than I have indicated. It may in many cases be expedient to make such inner lip or flange narrower than I have shown; but I esteem it desirable thus to guard the extreme edge of the glass against abrasion.

I claim as my improvement in exhibitors for carpets and analogous goods—

1. The series of mirrors A¹ A² A³ A⁴, having backs C, composed of cross-glued layers of wood, as herein specified.

2. The rectangular frame A¹ A² A³ A⁴, composed of mirrors backed with cross-glued wood C, loosely inclosed in frames B, and adapted to serve as herein specified.

3. The mirror-frame A³, provided with the stop J and spring-clip I, having a hooked beveled end, in combination with the mirror-frame A³, having a spring-clip and stop at one end, and the mirror-frame A⁴, whereby the mirror-frames A³ A⁴ can readily be engaged with the spring-clips or removed therefrom by a facewise movement of said frames, as herein specified.

In testimony whereof I have hereunto set my hand this 27th day of May, 1878, in the presence of two subscribing witnesses.

L. G. FRANCIS.

Witnesses:

CHAS. C. STETSON,
EDITH BROOKES.