

C. T. CAHILL.
 APPARATUS FOR RECEIVING PROJECTED IMAGES.
 APPLICATION FILED SEPT. 21, 1915.

1,218,979.

Patented Mar. 13, 1917.

fig. 1.

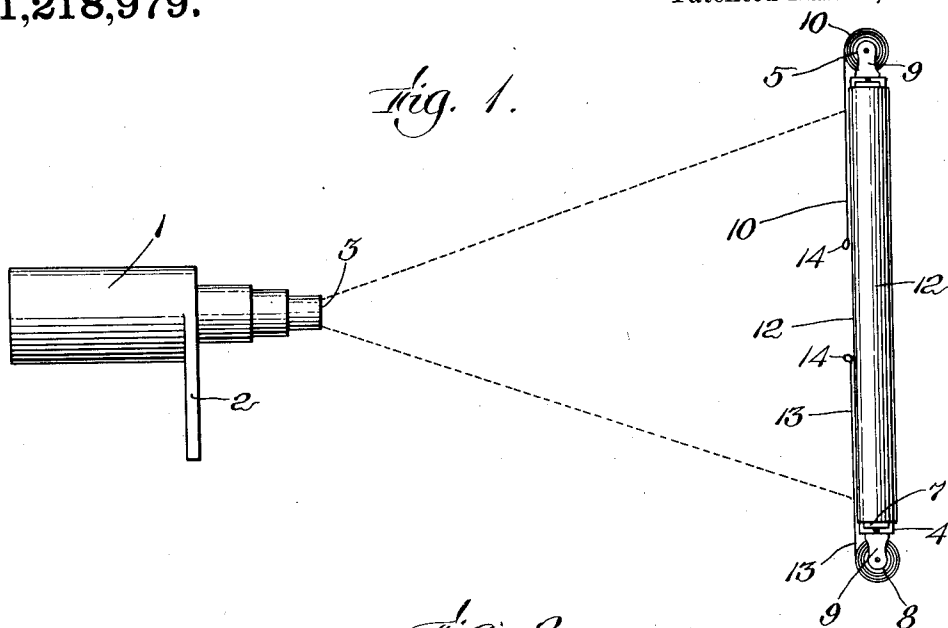
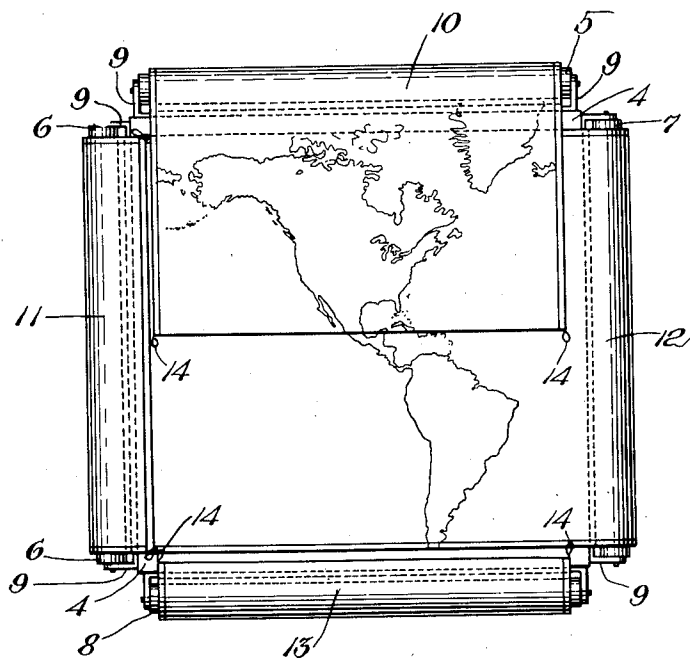


fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR RECEIVING PROJECTED IMAGES.

1,218,979.

Specification of Letters Patent.

Patented Mar. 13, 1917.

Application filed September 21, 1915. Serial No. 51,782.

To all whom it may concern:

Be it known that I, CHARLES T. CAHILL, a citizen of the United States, and resident of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Apparatus for Receiving Projected Images, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My present invention is a projecting apparatus designed particularly for use in enabling maps, charts, pictures, drawings, etc., to be thrown or projected on a screen in precisely the same relative position during successive removals and replacement of the screen. Also, to enable such projection to be thrown on one or more removable screens, and partly on one and partly on another, if desired.

The object of my present apparatus is for use as an educational apparatus, and also more particularly for use in working out problems for army or naval maneuvers. To this end I provide a projecting apparatus which is adapted to hold a slide or slides containing a reproduction or outline of a particular section, coast line, or the like, and cooperating therewith arrange a series of screens, each screen being adapted to be quickly positioned in or removed from the field of projection, and another screen being placed to receive the projected map. In working out war problems where one commander is in charge of one side and is delineating his maneuvers before the board of judges, and then the commander of the opposing force appears and delineates his maneuvers, each must be able to have a full outline of the territory being covered before him, and yet the operation of each commander must be kept from view of his rival. In this line of work my apparatus is particularly useful, a projection of the particular territory covered being constantly maintained on the screen, and one screen with one officer's side while receiving the projection can be marked, positions noted, directions followed out, and then this screen removed from the field of projection and all marks will be unintelligible. When again brought into the field of projection in the same position as before, the notations and map thrown thereon will be intelligible and show exactly the prior maneuvers and posi-

tions. In my apparatus, I employ any suitable fixed source of light which will always be in the same focus. To this end I prefer to use an incandescent electric light, which maintains its position, relatively to the lens and the screen stand. In the prior use of an arc light, the source of light was constantly shifting as the carbons burned away and continually varied the focal point.

In the drawings illustrating a preferred embodiment of my invention,

Figure 1 is a side view of a projecting device, shown in conventional form, together with my novel screen apparatus; and

Fig. 2 is a front view of the apparatus, showing a plurality of screens, each adapted to be moved from or brought into the range of the projection thrown upon the apparatus and covering any particular one, or two or more of the screens.

Referring to the drawings, 1 is a view of an ordinary stereopticon projecting device, having a slide receiving slot 2 in which a transparency of a map, plan, picture, or the like, is positioned, and the lens 3 mounted for focus on telescoping tubes as is usual. A light positioned in the device 1 throws the outline on the transparency at 2 through the lens 3 on to the screen apparatus, which will now be described. This apparatus comprises a backing 4 of wood, metal, or any suitable material, and of proper length and breadth to receive the projection thrown from the lens 3. Preferably, this member 4 is rectangular and carries a plurality of rollers 5, 6, 7, and 8, each mounted on a side and held by brackets 9 on said respective sides. These rollers may be of any desired type, preferably of the well-known Hartshorn roller type, which may be utilized to roll up the removable screens or to partially roll up the same. The rollers 5, 6, 7, and 8 carry the screens 10, 11, 12, and 13 respectively, each of said screens being adapted to be unwound from its containing roller and spread across the face of the backing 4 in position to receive the projection thrown thereon from the lens 3. I may provide each screen with loops 14 and use lines or ropes to manipulate the same where a large screen is desired, or may simply pull at one screen and allow it to receive as much of the projection as is desired. As illustrated in Fig. 2, the screen 10 is partially unrolled, receiving a portion of the projection thrown thereon and the screen 12 being also unrolled and

receiving a still further part of the projection.

As it is difficult to illustrate the detailed topography of a war map utilized in working out army and naval problems, I have illustrated, for the sake of convenience, a coastal outline of North and South America. Assuming that a naval maneuver is being plotted, the screen 10 can be drawn down and receiving the portion of the projected outline of North America, notations of a fleet could be plotted on the sheet 10 adjacent the outline at the coast, and the day, hour, etc., also noted. The screen 10 could then be rolled up and nothing would be left visible thereon excepting the notations which would be unintelligible without the adjacent coast-line shown, which outline, however, is thrown thereon only by the lens 3. With the screen 10 rolled up and the screen 12 in place to receive the same projection of the coastal outline, the position of a second fleet could be plotted on the sheet or screen 12. The screen 12 is then rolled up and the screen 10 drawn down, when further maneuvers and change of position of the first mentioned fleet could be plotted. In this manner the successive movements of each opposing fleet could be accurately plotted and permanently noted, always capable of instant comparison, proof, or the like, by drawing down the screen 10 to its former position and having the screen receive the outline as before; while with the screen rolled up, the data plotted thereon is entirely safe from observation or disclosure.

An entirely new map can also be instantly made by fitting in a different transparency or by utilizing the single transparency to throw its outline upon two, three, or four screens, thus saving the prior necessity of having a large number of maps which were marked up with each problem.

As an educational apparatus, my invention is also specially useful, the screens, for example, being used by a student to draw maps, figures, or other detailed outlines, and then when positioned to receive the projection of the model drawn thereon, will instantly show where faulty and where corrections are needed. Furthermore, I may utilize my apparatus for making various sized outlines, projecting one outline on a sheet, then changing the focus of the lens 3 and enlarging or diminishing, proportionately, the same outline or pattern.

I believe that my novel method of utilizing a single transparency to throw projections upon a plurality of screens for educational or other purposes is a distinct novelty, and I wish to claim the same broadly. Also the apparatus having provision for a plurality of screens to be drawn into the field of a projecting outline, figure, picture, or the like, as well as to have separate notations on

each which are unintelligible and secreted when removed from the projecting field, is also a distinct novelty, and I claim the same broadly. I also believe that the operation of having a single undermost sheet which receives the projection at all times irrespective of whether or not one of the other overlapping sheets is partially in position or not, on which undermost or foundation sheet the markings, data, figures, etc., are plotted, which plottings are instantly vitalized and rendered intelligible when the projection is thrown thereon, is distinctly new. This last named feature is particularly valuable when using the apparatus as a war map of detailed topography in working out army maneuvers and problems, the umpires being enabled to call in one side, accurately plot their movements on the undermost or bottom screen, then partially draw over the same one of the overlapping screens, while permitting the other side to plot their maneuvers on the same fixed screen, without disclosing the data plotted in the first instance, particularly when both parties are presumed to be out of sight of each other on the actual field of operations. In this form of use also, it is feasible to project with the detailed map and at one side all the notations necessary for use in such army maneuvers, *i. e.*, a scale of miles reproduced in actual proportion of the map to the field it represents, data for movements of infantry, cavalry, messengers, etc., which have been determined in advance by the rules for the maneuvers. Such scale and data automatically follow the adjustment of the projection on the screen, irrespective of distance, and remain at all times in proper projected proportion, without separate measurements and adjustments for the scale of miles, etc., on the screen as focused. In my arrangement of a plurality of screens, each capable of being positioned into the field of view of the projecting apparatus on substantially the same plane, the focus of the source of light need not be changed, but remains constant during the positioning of any one of the plurality of screens in the device. Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. Apparatus of the kind described, comprising means to hold a plurality of screens, in combination with mechanism arranged to permit a selected one of said screens to be drawn from different angular directions across the field of view of the apparatus in substantially the same plane as that of each of the other screens of said plurality.

2. Apparatus of the kind described, comprising means to hold a plurality of screens, consisting in a plurality of self-acting rollers arranged to permit each of said screens to be drawn across the same field of view and to have two or more of said screens oc-

cupying a portion of said field of view simultaneously.

3. Apparatus of the kind described, comprising a plurality of screens, each screen
5 being mounted on an independent self-acting roller, and projecting apparatus cooperating therewith and adapted to maintain a projected view in the same relative position on different screens successively brought into
10 the field of view.

4. Apparatus for projecting a view on a plurality of screens, comprising a source of light, means to position one or more of said screens in the field of view of the projecting
15 part of said apparatus, each screen being substantially in the same focal plane, and being moved into or out of view from relatively angular directions.

5. Apparatus for projecting a view on a
20 plurality of screens, comprising mountings

for said screens adjacent the field of view of the projecting apparatus, means to position any screen across the field of projection, successively or simultaneously with the overlapping portions of a plurality of screens being
25 all in substantially the same plane and capable of receiving the view projected from the same distance, whereby each of a plurality of screens may receive separate and independent data in connection with the projection appearing on all the screens within the
30 field of view.

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

CHARLES T. CAHILL.

Witnesses:

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SEBASTIAN VAUGHAN.