(No Model.) 2 Sheets—Sheet 1.

J. W. GRAYDON.

SIGNALING APPARATUS.

No. 505,879. Patented Oct. 3, 1893.

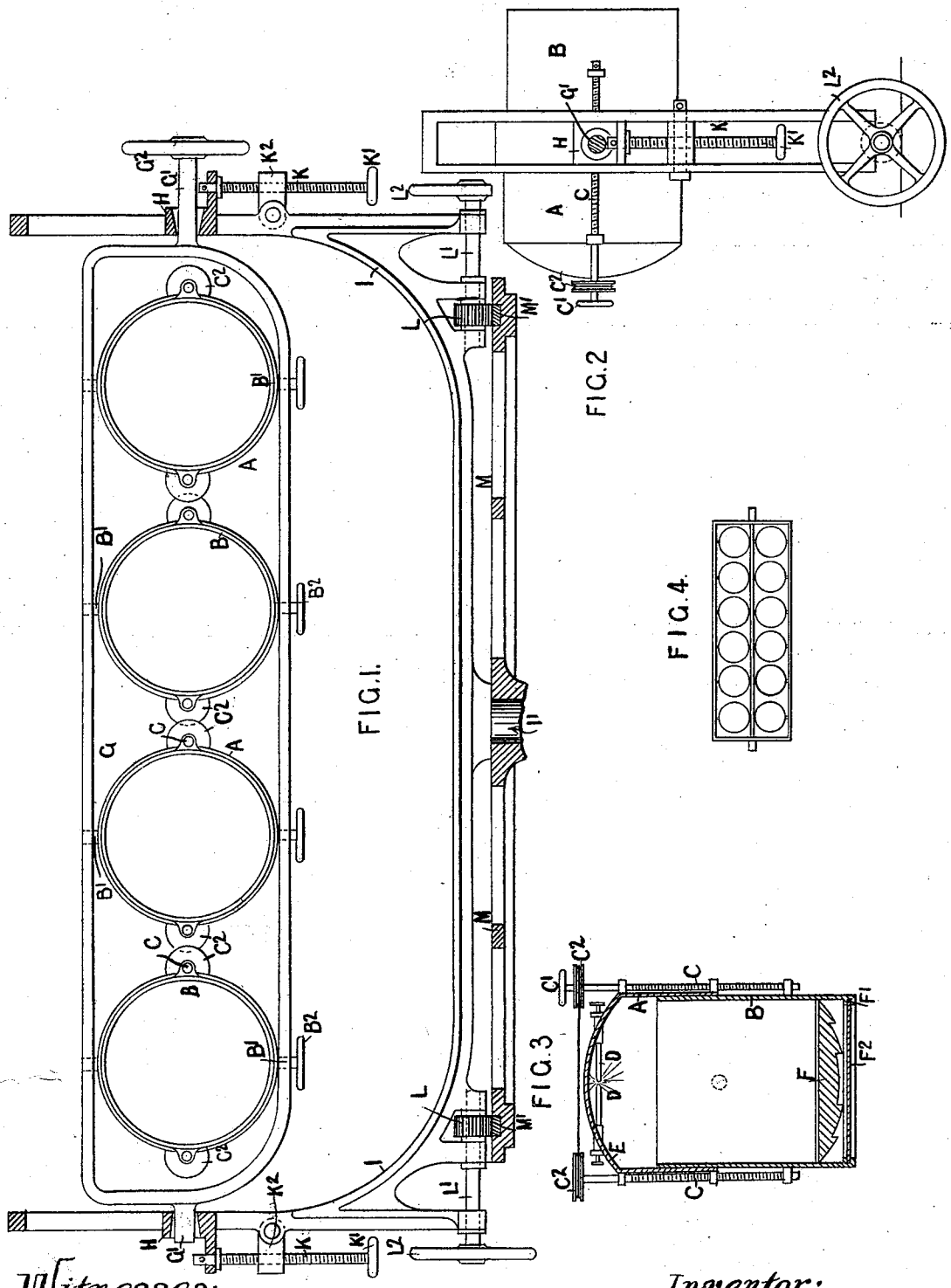

FIG. 1.

FIG. 2.

FIG. 4.

FIG. 3.

Witnesses:
H. G. Dieterich
Wm. B. Sebastian.

Inventor:
James Weir Graydon
By Henry Orth Atty.

(No Model.) 2 Sheets—Sheet 2.

J. W. GRAYDON.

SIGNALING APPARATUS.

No. 505,879. Patented Oct. 3, 1893.

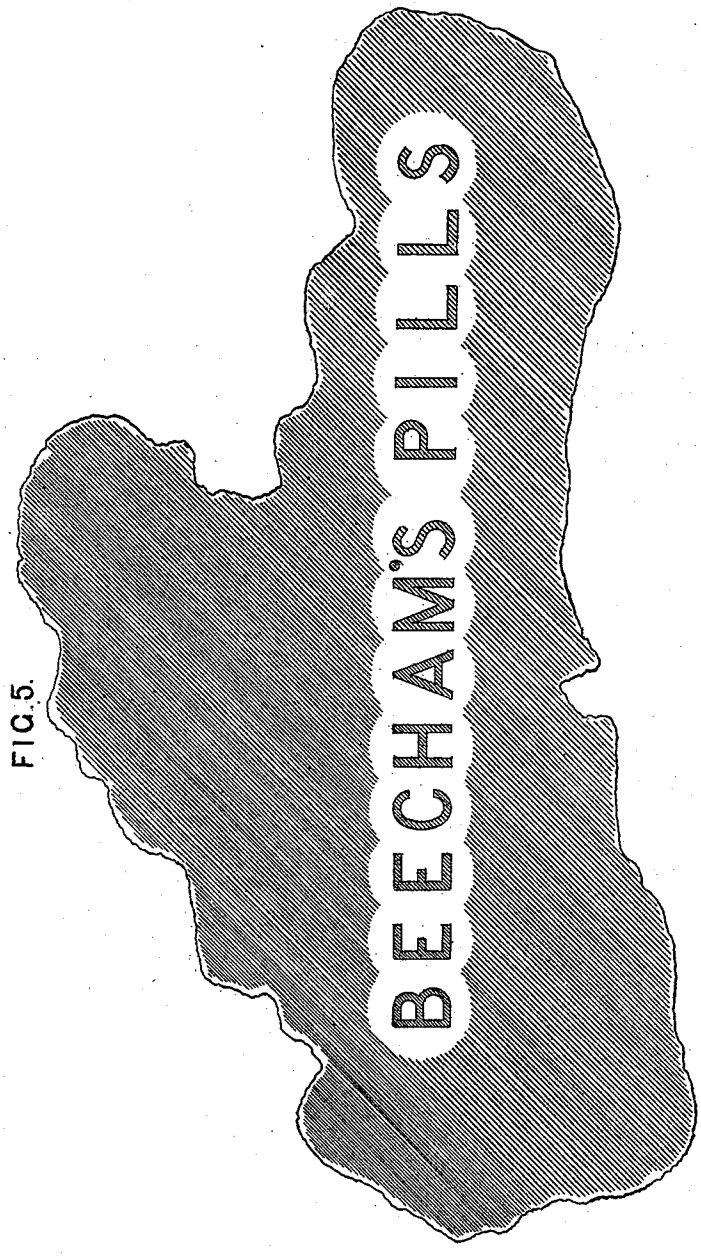

FIG. 5.

Witnesses:
H. G. Dieterich
B. Sommers

Inventor:
James Weir Graydon.
By Henry Orth
Atty.

UNITED STATES PATENT OFFICE.

JAMES WEIR GRAYDON, OF LONDON, ENGLAND, ASSIGNOR TO WILLIAM F. CODY.

SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 505,879, dated October 3, 1893.

Application filed September 30, 1892. Serial No. 447,412. (No model.)

To all whom it may concern:

Be it known that I, JAMES WEIR GRAYDON, late lieutenant United States Navy, a citizen of the United States, residing at 1 Burlington Gardens, London, England, have invented new and useful Improvements in Signaling Apparatus, of which the following is a specification.

This invention has relation to apparatus adapted for signaling and other purposes, as for instance, the displaying of photographic negatives or other pictures of persons, landscapes, seascapes, or theatrical or other representations or advertisements upon the clouds or upon fog clouds, or smoke or vapor, naturally or artificially produced, or upon beams of light, as will hereinafter be fully described.

In carrying out my invention I employ an apparatus consisting of two or more light projecting telescopic cylinders so mounted in a frame as to be capable of being turned on a pivot at top and at bottom. This frame which I call the swing frame is mounted at each end with a pivot in an adjustable sliding bearing. By means of a hand wheel on one of the pivots the swing frame can be adjusted in any position around its axis. The sliding bearings are mounted so as to slide up or down on a frame which I call the turntable frame and which can be turned around its vertical axis upon a foundation plate. The latter is for some uses stationary and for others portable and then provided with wheels for traveling.

Figure 1 of the accompanying drawings is a part sectional front view and Fig. 2 an end view of an apparatus containing as an example one row of four light-projecting cylinders. Fig. 3 is a horizontal section of one such cylinder. Fig. 4 is a front view of a double row of light projecting cylinders with six of same in each row. Fig. 5 shows a luminous advertisement thrown upon a cloud.

Each light projecting cylinder consists mainly of two parts A and B sliding one upon the other telescopically and adjustable by means of the screws C, a hand wheel C′ on one of them, and an endless cord and pulleys C^2. In the rear part of the cylinder are the carbons D for an ordinary electric arc light which is operated from a dynamo or other source of electricity. The back of the part A has a concave mirror E. In the front of the part B is fixed a Fresnel lens F (or other suitable condensing lens). In front of this lens the cylinder is formed with a ring F′ having a vertical or transverse slot in it adapted to receive the slide F^2 containing a white or colored transparency such as a picture, letter, signal or other device which is to be projected. The transparency may in some cases have the device transparent and in other cases the background transparent. Each cylinder has an upper and lower pivot B′ which work in the swing frame G and can be adjusted therein by the hand-wheel B^2. The swing frame G has at each end a pivot G′ on one of which is fixed the hand wheel G^2 for adjustment of the swing frame. The pivots G′ work in the sliding bearings H which are mounted on the turntable frame I. The swing frame can be canted as desired relatively to the frame I by means of one or other of the adjusting screws K which are provided with handwheel K′. The bearings H are oval at their outer ends to allow for the canting and are for the same reason jointed to the nuts K^2 for the screws K. The turntable frame I may or may not have a central pivot I′ and can be worked around its vertical axis by means of one or more tooth wheels L which can travel on a circular tooth rack M′ of the foundation plate M. This latter may be stationary or on wheels. I have shown suitable means for effecting the various adjustments but any other mechanical equivalents may of course be employed for the purpose. By means of this apparatus when a slide F^2 is inserted in each cylinder the picture or device on the slide can be projected in the direction of any part of the heavens and thus upon a cloud in any part thereof. If for example the slides together make up the words Beecham's Pills I first direct the apparatus toward the cloud by means of the various adjusting wheels and then adjust the central cylinders to project to the right point in the cloud. The other cylinders are then by means of the wheels B^2 so adjusted that their slides bring the letters

at the desired distance from each other. Fig. 5 shows the field formed upon the background of a cloud, such field containing or forming a display of an advertisement.

Any combination of numbers of cylinders may be arranged in one frame to form an extended high or long field of display for luminous advertisements, the words being arranged in one or more rows. The whole field of display is moreover capable of sweeping the heavens in all directions horizontally vertically or at any angle.

The letters on the slides may be transparent on an opaque ground or opaque on a transparent ground. Moreover the transparent part of the slide may be in various colors.

In order in clear weather to form a suitable background for throwing the luminous device thereupon I may by means of smoke rockets or otherwise form a smoke cloud upon which I project the luminous device. I may also project the luminous device upon the light beam from an electric light projector providing that such beam is of a suitable color to form a background for the luminous device the two being of different colors.

One person can manage the whole of the apparatus. By this apparatus signal symbols or letters or other devices, portraits, landscapes, seascapes, figures in white or other colors, political or any other news, stock quotations, results of races, elections or any other announcements may be given an immense sphere of publicity. Its application to military and naval signaling is also very extended whether during battles or otherwise for issuing and receiving orders, and that at greater distances than heretofore possible.

Having fully described my invention, what I desire to claim and secure by Letters Patent is—

1. In a signaling apparatus, a group of light projectors adjustable independently about vertical axes and simultaneously about horizontal axes.

2. In a signaling apparatus, a group of light projectors adjustable independently about vertical axes and simultaneously about horizontal axes, each projector adapted to project a signal or signal symbol, an independent source of light for each of said projectors, and adjusting devices for adjusting the focal distance of the projectors.

3. In a signaling apparatus, a group of light projectors revoluble independently about vertical axes and about a horizontal and vertical axis common to all said projectors, for the purpose set forth.

4. In a signaling apparatus, a frame adjustable about a horizontal axis, and a group of light projectors adjustable in said frame about independent vertical axes, for the purpose set forth.

5. In a signaling apparatus, a frame adjustable about a horizontal axis, and a group of light projectors adjustable in said frame about independent vertical axes, in combination with a supporting frame adjustable about a vertical axis, for the purpose set forth.

6. In a signaling apparatus, a supporting frame revoluble about a vertical axis, a projector frame adjustable vertically as well as about a horizontal axis in said supporting frame and a group of light projectors adjustable about independent vertical axes, for the purpose set forth.

JAMES WEIR GRAYDON.

Witnesses:
T. J. OSMAN,
T. F. BARNES.