G. F. CAHILL.

ILLUMINATING SYSTEM FOR BASE BALL AND OTHER GAMES.

APPLICATION FILED JUNE 1, 1909. RENEWED DEC. 21, 1916.

1,235,527. Patented July 31, 1917.

3 SHEETS—SHEET 1.

FIG. 1.

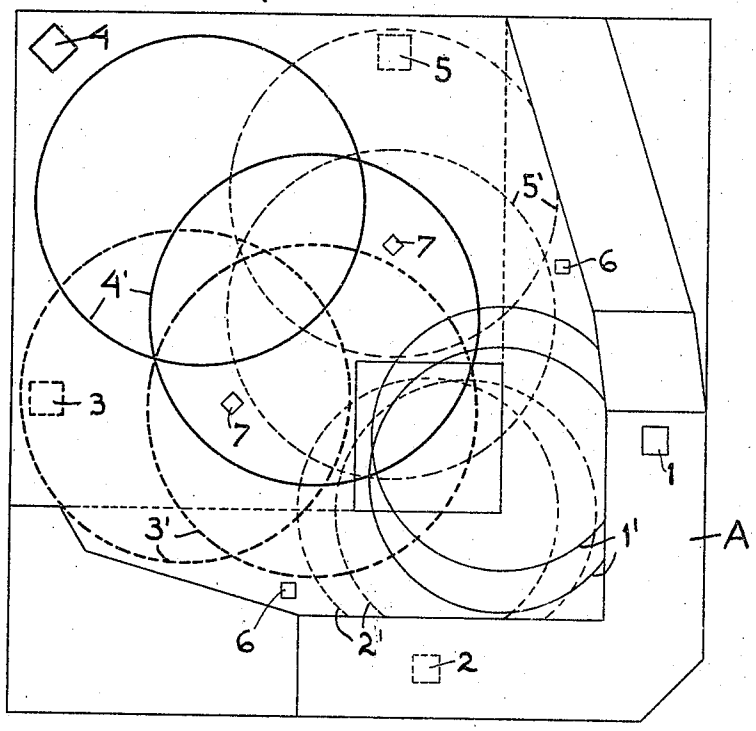


FIG. 2.

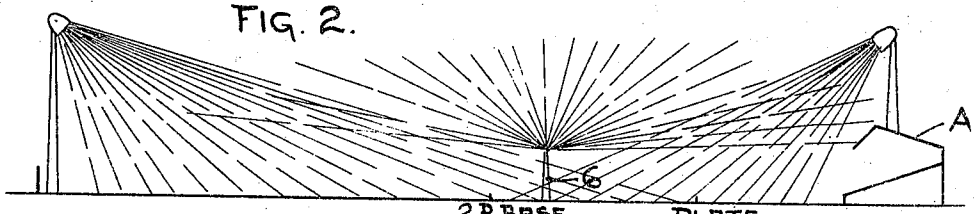


FIG. 3.

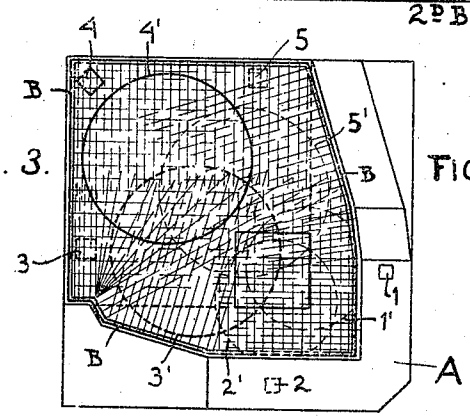
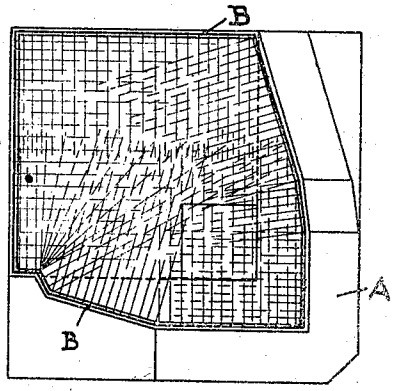


FIG. 4.



ATTEST.

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3 SHEETS—SHEET 2.

FIG. 5

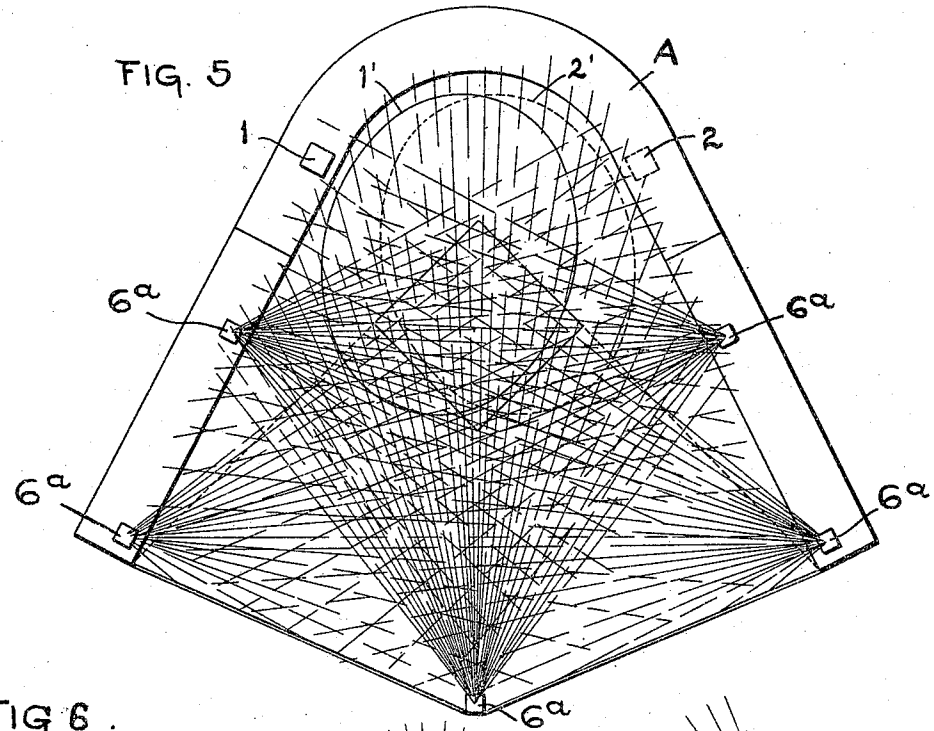
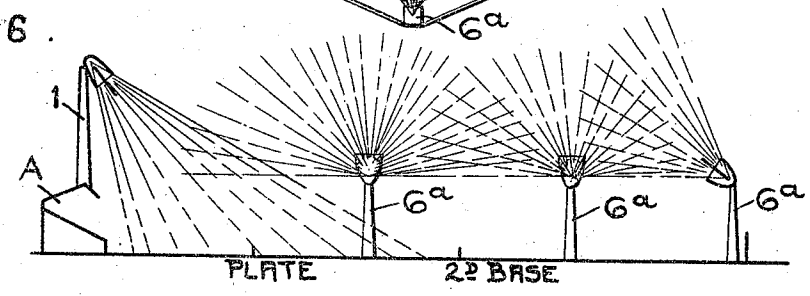


FIG 6.



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3 SHEETS—SHEET 3.

FIG 7.

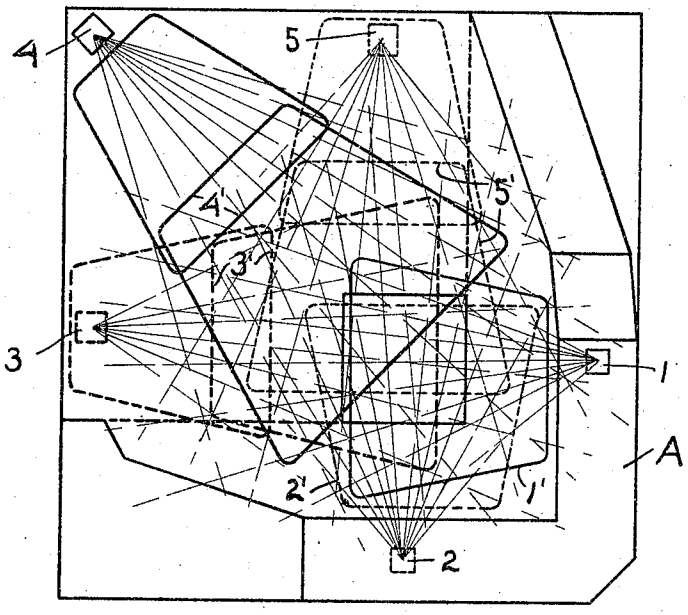


FIG 8

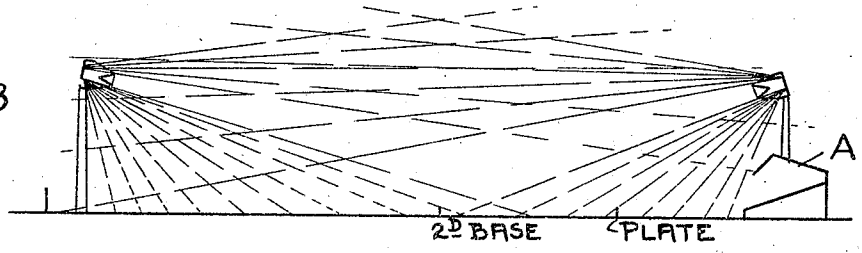


FIG 9

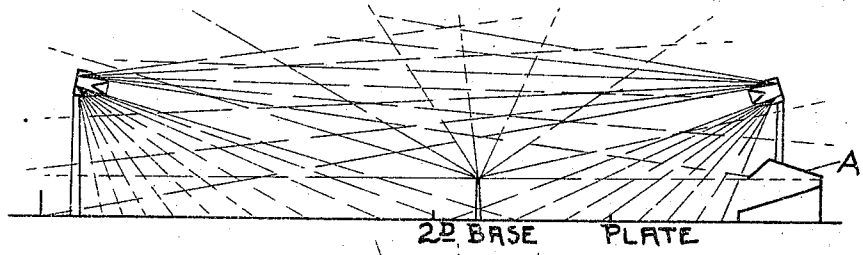
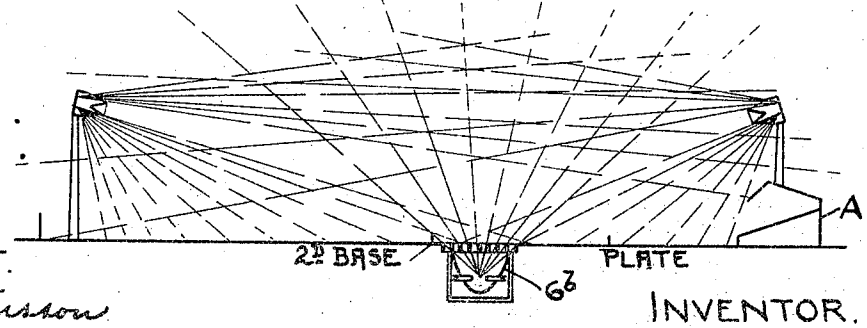


FIG 10.



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UNITED STATES PATENT OFFICE.

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ILLUMINATING SYSTEM FOR BASE-BALL AND OTHER GAMES.

1,235,527. Specification of Letters Patent. Patented July 31, 1917.

Application filed June 1, 1909, Serial No. 499,281. Renewed December 21, 1916. Serial No. 138,280.

To all whom it may concern:

Be it known that I, GEORGE F. CAHILL, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Illuminating Systems for Base-Ball and Other Games, of which the following is a specification.

My invention relates especially to the art of or systems for, illuminating large areas so that base ball and other games may be played at night, and to the lamps, reflectors, shades and other means or apparatus used in carrying out the main or principal part of my invention. One object of my invention is to so place or dispose the lights or lighting sources, and reflectors and shades therefor, that a powerful illumination will be obtained over the area where the most active play takes place, and also in the space over the field where batted balls pass, while protecting as far as possible the players and spectators from the direct rays or glare of such lights, when they are in their normal positions, or those occupied during the larger part of the game of base ball especially. Another object is to so dispose the lamps and the reflectors therefor as to secure a diffused quality of light, as free from shadows and poorly illuminated spaces as possible. Another object is to produce a lamp or lamps, giving an exceedingly powerful light of a good quality, and easily maintained, also to produce reflecting surfaces and obscuring surfaces, or means so devised as to concentrate the light upon the area or areas or through the space or spaces where it is desired, and to obscure the direct rays of light from other areas or spaces, as desired.

In the accompanying drawings—

Figure 1 is an outline or diagrammatic view of one embodiment of my system for so illuminating a base ball ground, that base ball and other games may be played at night;

Fig. 2, is a diagrammatic sectional view, on a line which would intersect the apex of the grandstand, the home plate, second base and deep center field of Fig. 1, the position of the towers over the grandstand being changed to directly back of the home plate;

Figs. 3 and 4, are diagrammatic views of an embodiment of a modified form of my invention;

Figs. 5 and 6, are diagrammatic views of a modified construction, using a larger number of skylights and fewer lights on towers;

Figs. 7 to 10, illustrate constructions in which the lamps on the towers throw a split or double beam of light in place of the single beam of Fig. 2.

In the embodiment of my invention for lighting fields so that games and especially base ball may be played at night, illustrated diagrammatically in Figs. 1 and 2 of the drawings, 1, 2, 3, 4, and 5 are towers, poles or columns rising a considerable distance into the air and carrying upon their tops lamps or other sources of illumination. Hereinafter they will be spoken of ordinarily as towers and simply as lights on top of towers. On top of each tower in the construction of Fig. 1 are preferably two powerful lamps, the direct rays from each of which are trained by means of reflecting surfaces to illuminate a predetermined part of the field, substantially as indicated by the circles in Fig. 1 and are obscured from other parts. A square to represent the tower, and circles to indicate substantially the area illuminated therefrom are shown by the same character of lines—light or heavy, dotted or solid. Thus, the lamps on the tower, 1, preferably erected on top of the grandstand, A, illuminate about the areas inclosed within the circles, 1′, 1′, while the lights on the tower, 2, also preferably erected above the grandstand, illuminate substantially the areas inclosed within the circles 2′, 2′. In like manner, the lamps on the out field towers, illuminate substantially the areas inclosed within the circles designated by the numerals 3′, 3′, 4′, 4′, and 5′, 5′. The area illuminated by each lamp is, in fact, more elliptical than circular as the plane of the earth cuts the circular beam of light at an acute angle (see Fig. 2). A circle has been shown in the drawings, for the sake of convenience, more particularly as the shape of the ellipse depends upon the exact position and elevation of the towers and lamps and may differ with every field. Nor is the beam of light necessarily of a circular form; in some cases, it is better to be of a rectangular or irregular shape and may, where desired, extend well outside the diamond into the out field on the side near the lamp, the es-

sential being that its direct rays be shaded from the player or players looking toward that light when looking in the general direction of the home plate. The object of this arrangement is to protect the eyes of the players from being dazzled by the glare of the direct rays of the light in front of and above them. Thus the direct rays of light from the tower, 1, somewhat in front of third base and short stop, are trained to the ground before they reach third base or second base, so that the third baseman, short stop and left fielder especially are not dazzled by the direct rays of light from the lamps on top of the tower, 1. Similarly the direct rays of light from the tower, 2, somewhat in front of first baseman and second baseman, are trained to the ground before they reach second base, so that first baseman, second baseman and right fielder are not dazzled by the glare of the lights toward which they face. Also, the direct rays of light from the lamps on the tower, 3, back of the left fielder, are trained to the ground before they reach the catcher and batter and first baseman, who sometimes look toward that light. Similarly the direct rays of light from the lamps on the tower, 5, back of the right fielder, are trained to the ground before they reach the catcher and batter and third baseman, who sometimes look toward those lights when receiving the rapidly moving ball. The direct rays of light from the lamps on top of the tower, 4, back of center fielder are trained to the ground before they reach third base, home base, or first base, in order to protect the players in those positions from the glare of the lights back of center field. By this disposition of the lamps and reflectors or shades to determine the areas illuminated thereby, every player, when in his normal position looking toward the home plate, is in an area lighted by a powerful lamp or lamps above and behind him, while he is protected from the direct rays of the lamp or lamps toward which he looks. The rays of other lights situated at, 6, 6, or even at, 7, 7, are thrown into the air to illuminate the space above the field where batted balls pass, the lamps being so protected by a hood or reflector as to prevent any of the direct rays from falling low enough to strike into the eyes of any of the players. The exact position or height above the ground of lights to illuminate the space above the field may, of course, be greatly varied; they may, in fact, be placed substantially under the lamps on towers previously described and may serve to throw a beam of light into the air over the heads of players looking toward them, while the higher lights throw light on to the field itself or on the field and also into the air above the players. The diagrammatic view, Fig. 2, is a longitudinal section through the grandstand, home plate and second base and for the purpose of this view the lamps over the grandstand are supposed to be brought to a position straight back of the home plate. The points marked on the ground line represent the home plate and second base. This figure especially in conjunction with Fig. 1, is intended to show the manner in which the lights are trained to the ground in front of the players facing toward them, and also, the manner of protecting the players from the lamps for illuminating the space above the field where batted balls pass.

Certain essential principles of my invention for illuminating fields so that base ball may be played at night—especially the obtaining of a powerful illumination, while protecting the eyes of the players from the glare of the source or sources of illumination—may be embodied in any one of several different forms. In the construction shown in Fig. 3, a number of lights are placed upon towers, 1, 2, 3, 4 and 5, and their rays trained upon the ground, substantially as shown in the drawing. Also, a secondary source or sources of light, B, disposed around the field, serves to light the space above the field and to produce a highly diffused illumination. In the construction shown in Fig. 4, the entire illumination is obtained from a source or sources of illumination, B, disposed around the field, without the assistance of any powerful light or lights trained especially upon the surface of the field. Most of these figures are of outline or diagrammatic form, many of the smaller parts being omitted, partly because of the limitations as to the size of drawing permitted, and partly for the reason that in many of them, the principle can be best exemplified in such form, as the exact form of lamp or source of illumination, and even the exact disposition thereof is not essential to the carrying out of this part of my invention. In some of the constructions shown in the drawings, it is highly desirable to obtain the most light possible from a comparatively small source of illumination or illuminating surface, while in others a larger illuminating source with a low brilliancy is desired. Thus in those constructions, where the illuminating surface is hidden from the eyes of the players facing toward it, a small illuminating surface is generally preferable. But on the other hand, the illuminating surface or surfaces may be exposed to the eyes of the players if a very large surface of low brilliancy be used. In the construction of Fig. 1, small illuminating surfaces of great brilliancy, so protected as not to dazzle the eyes of the players facing toward them, are used; in the construction of Fig. 4, a very large illuminating surface of small brilliancy, exposed to the view of the players, is shown, while in Fig. 3, a combination of the two

principles is employed. As, however, most sources of illumination that are used commercially are too brilliant to be exposed to the eyes of the players when used in great numbers or with large exposed surfaces, a reflecting surface or secondary source of illumination must generally be used, while the real light or sources of illumination must be obscured. Any suitable source of illumination, not too brilliant, may be placed on the playing side of the reflecting surface and the direct source of illumination obscured from the eyes of the players. A row of incandescent electric lights, a mercury vapor or Moore tube, illuminating gas, acetylene, even kerosene, gasolene, etc., might be used as far as the principle of my invention is concerned. Of the reflecting secondary illuminating surfaces, I have said, "of any suitable color." White is not the only color to be used, for with the mercury vapor and Moore tubes, a tint is sometimes given to a reflecting surface with advantage, and it may sometimes be found desirable to slightly tint or darken the lower part of a white reflecting surface near a strong source of illumination, to prevent it from being brilliant enough to affect the eyes of the players.

By a lamp of a more powerful character, say a large flame arc lamp, powerful rays may be thrown against the reflecting surface, which must necessarily be of considerable size, to prevent the players from being disturbed thereby, and also at a considerable distance from the lamp. I have used a reflecting surface about 20 feet square and some 20 or 25 feet from the lamp and have found it too brilliant for the eye, unless at a considerable distance. The size of the reflecting surface, must of course, be determined for each field, dependent upon the power of the lamps, the distance from the lamps and the players, the angle with relation to the lamp and to the players, etc. The lamp may be at any angle to the reflecting surface that will deflect or reflect the rays of the light to the space intended and, of course, with the least loss possible. Again, most of the rays of light may be thrown directly into the air and only the rays passing somewhat to the side deflected by the reflecting surface, or the reflecting surface may be curved, to reflect the rays more inwardly.

Lights to illuminate the space above the field, and none of whose direct rays fall low enough to dazzle the eyes of the players, have been mentioned in this specification, and especially in connection with the construction of Fig. 1. For convenience, such lights may be called sky lights. While none of their direct rays falls low enough to dazzle the eyes of the players, there is, however, a considerable refracted, diffused or broken light from such sky lights, which, if the lights be properly placed and not too high above the ground, serves to produce quite an illumination of the field proper. Figs. 5 and 6 illustrate a construction in which lights upon the towers 1 and 2, are used to illuminate the in-field, as indicated by the elliptical lines 1′ and 2′, while a number of sky lights 6^a, 6^a, pour their powerful rays into the space over the field, and also a great number of refracted, broken or secondary rays all over the field. For clearness of illustration, in the sectional view, Fig. 6, the lights over the grandstand are supposed to be placed directly back of the home plate.

In all the constructions, or systems, so far described, for illuminating fields so that the game of base ball especially may be played at night, the lights upon the towers have been shown as trained to the ground before reaching the players facing toward them, no rays coming out of such lamps to light the space above such players' heads. Three difficulties were found to arise from all such constructions: First, while the direct rays of light in front of an in-fielder, for instance, were trained to the ground before reaching him, the far side of the reflector, or part of it was exposed to his view and with the powerful lamps I have devised and used the entire surface of even a very large reflector proved dazzlingly brilliant; second, the lamps have to be tilted or directed so far downward to bring the edge of the area illuminated in front of the infielder that a considerable loss of light occurred; and third, especially in a large field, the space above the field was not as well illuminated as could be desired, except as such illumination was obtained from the sky lights previously described. After years of work, the expenditure of many thousands of dollars and much study of the problems involved, certain constructions have been devised to overcome the difficulties mentioned. While these constructions have proved a substantially perfect protection to the eyes of the players from the brilliant reflector, they have increased the third difficulty mentioned and reduced the general diffusion of light. Still another construction of lamp or another construction of shades or reflectors with relation to the source of light, appears, however, to meet all the requirements better than anything else I have yet been able to devise and to a remarkably perfect degree. A lamp of the type mentioned, mounted upon the tower, 1, throws a powerful light over the space between the stand and the diamond and over most of the diamond, but limits the beam of light so that it falls to the ground before it reaches the line from second base to third base; and also projects another powerful beam of light through the space above the field, the lower rays of which pass just over the head of the

left-fielder, while the brilliant source of light is hidden from the third baseman, short stop and left-fielder. With lamps constructed upon this principle, a method or system of illumination, such as that shown in the diagrammatic views, Figs. 7 to 10, may be used. Fig. 7 is a view substantially similar to Fig. 1, in so far as the positions of the towers and the general areas illuminated by each lamp are concerned, but with lines to indicate the upper beams of light also. (With this form of lamp the areas illuminated are preferably more nearly rectangular than circular or elliptical.) It is very difficult to make such a drawing simple, on account of the overlapping of lines, but it is thought to be perfectly clear when taken in conjunction with the other drawings in this specification. Figs. 8, 9 and 10, are diagrammatic sectional views, on a line through the grandstand, home plate and second base, of a construction using such lamps and otherwise substantially similar to Fig. 2, except that in Fig. 8, the sky light, 6, of Fig. 2, is omitted, while in Fig. 10, a light, 6^b, placed in the ground and covered with a grating, is used, in place of such sky light, 6. In many fields ground sky lights, 6^b, might be placed at or about the positions marked, 7, 7, on Fig. 1. Such ground sky lights might, of course, be used in place of the elevated sky lights of Figs. 1, 5 and 6. In fact, lights placed in the ground might be used in place of the sky lights shown especially in such figures as 1, 5 and 6, or in such constructions as those of Figs. 3 and 4. In the Figs. 7 to 10, as few lines as possible to represent the beams of light, have been used as the figures appear much clearer than when a larger number are filled in.

When, in this specification, and especially in the statement of claim at the end hereof, I use the expression "a source or sources of light, and shades therefor," I desire it to be distinctly understood that I use the word "shades" in a broad sense to include either or both shades and reflectors, for when considered technically, every shade is also a reflector and every reflector is also a shade; to include one shade or several shades, for a given construction may be formed elaborately of one piece of sheet or cast metal, or otherwise, or of several pieces; of several pieces intimately connected together so as to become practically one, or of several parts or pieces not actually joined together at all. Thus, in an equipment on a certain national league grounds, the part that formed the shade between the two beams of light acted also as a reflector and was an integral part of the lamp; the part that performed practically the same function in another equipment was many feet from the lamp proper, was more than twenty feet long, and was not intended to act as a reflector at all; it was in fact made of canvas, and colored a dull black to keep its reflecting quality down to a minimum. Again, the same piece of metal may serve as a reflector at one point and as a shade at another. Although it seems impossible to find any word or expression that exactly expresses the meaning, applicant desires full and complete protection for all parts and uses of his invention.

When, in this specification, and especially in the statement of claim at the end hereof, I use the words, in speaking of an outfield lamp, "located in the outfield," or other similar expressions, I wish it to be distinctly understood that said lamp or source of light does not necessarily have to be within the outfield, but might as well, in many cases, be outside the field, and in some cases, might be located beyond the foul line, the essential being that it be backward from the infielder into whose playing area it throws its light.

The circles or other lines on some of the drawings to indicate areas illuminated from a certain lamp or lamps are, of course, merely suggestive and not intended as exact limitations of such areas. These areas may, in fact, be greatly varied, so long as the essential principles of my invention are adhered to and a given area of illumination may be illuminated all by one lamp or by several lamps or different parts of it, chiefly by one or other different lamps.

Also, where in this specification and especially in the statement of claim at the end hereof, I sometimes speak of the lamps or sources of illumination in the singular and sometimes in the plural, it is not necessary that such group be all placed in one position or closely grouped together. In one equipment I have, in fact, placed all the lamps high in the air and drawn a beam for illuminating a definite part of the field and also a beam for illuminating the space over the field out of one and the same lamp. On another field from a lamp high above the field, I drew two such beams, and from still another lamp, lower down than the one first mentioned, I drew another beam to illuminate the space over the field, gaining in this manner a considerably more uniform lighting effect in the space over the field above the players' heads.

Some features of the invention illustrated in the accompanying drawings and described in this specification, although illustrated and described herein, are not claimed herein, since the same form part of the subject matter of my other pending application, Serial No. 177,533, filed June 28, 1917, as a division of this application. I do not claim in this application what is claimed in the divisional application before mentioned. And I wish it to be clearly understood that I do not desire or intend to dedicate or abandon

any part of my invention to the public, but that I wish just and adequate protection for the whole, and every part thereof, either in this application or in the divisional application aforesaid.

What, therefore, I claim in this present application and desire to secure by Letters Patent hereunder, is—

1. In a system for illuminating a baseball field, the combination of a source of light, with shades therefor, located in front of and above an infielder and constructed and disposed in such a manner that the light aforesaid throws a beam of light onto parts of the diamond in front of said infielder without the direct rays thereof reaching to the eyes of said infielder, and throws another beam of light into the air over the head of said infielder without the direct rays of light falling into the eyes of said infielder or of an outfielder substantially back of said infielder, said two beams of light being separated by a darkened space or area from which space said infielder and outfielder can look toward the light without the direct rays thereof falling into their eyes.

2. In a system for illuminating a baseball field, the combination of a source or sources of light, with shades therefor, located in front of and above an infielder and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said infielder, without the direct rays thereof reaching to the eyes of said infielder, and throw another beam of light into the air over the head of said infielder without the direct rays of light falling into the eyes of said infielder, said two beams of light being separated by a darkened space or area from which space said infielder can look toward the light without the direct rays thereof falling into his eyes, and another light, located to the side of said infielder and throwing a beam of light over the darkened area in which said infielder stands.

3. In a system for illuminating a baseball field, the combination of a source or sources of light, with shades therefor, located in front of and above an infielder and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said infielder without the direct rays thereof reaching to the eyes of said infielder, and throw another beam of light into the air over the head of said infielder and of an outfielder substantially back of said infielder without the direct rays of light falling into the eyes of said infielder or said outfielder, said two beams of light being separated by a darkened space or area from which space said infielder and said outfielder can look toward the light without the direct rays thereof falling into their eyes, and another light located behind said infielder and said outfielder and throwing light upon the space occupied by said infielder and said outfielder.

4. In a system for illuminating a base ball field, the combination of a source or sources of light, with shades therefor, located in front of and above an infielder and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said infielder without the direct rays thereof reaching to the eyes of said infielder, and throw another beam of light into the air over the head of said infielder without the direct rays of light falling into the eyes of said infielder, said two beams of light being separated by a darkened space or area from which space said infielder can look toward the light without the direct rays thereof falling into his eyes, and another light located to the side of said infielder and throwing a beam of light over the darkened area in which said infielder stands, and another light located behind said infielder and throwing light upon the space occupied by said infielder.

5. In a system for illuminating a baseball field, the combination of a source or sources of light, with shades therefor, located in front of and above an infielder and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said infielder without the direct rays thereof reaching to the eyes of said infielder, and throw another beam of light into the air over the head of said infielder without the direct rays of light falling into the eyes of said infielder or an outfielder substantially back of said infielder, said two beams of light being separated by a darkened space or area from which space said infielder and said outfielder can look toward the light without the direct rays thereof falling into their eyes, and another source or sources of light, with shades therefor, located in the outfield and constructed and disposed in such a manner that said light throws a beam of light over the space occupied by said infielder, without the direct rays thereof reaching to the eyes of the catcher and batter.

6. In a system for illuminating a baseball field, the combination of a source or sources of light, with shades therefor, located in front of and above an infielder and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said infielder without the direct rays thereof reaching to the eyes of said infielder, and throw another beam of light into the air over the head of said infielder and of an outfielder substantially back of

said infielder, without the direct rays of light falling into the eyes of said infielder or said outfielder, said two beams of light being separated by a darkened space or area from which space said infielder and said outfielder can look toward the light without the direct rays thereof falling into their eyes, and another source or sources of light, with shades therefor, located backward from said infielder, and constructed and disposed in such a manner that the light throws a beam of light onto the space occupied by said infielder and said outfielder, without the direct rays thereof reaching the eyes of the batter or catcher, and throws another beam of light into the air over the heads of said infielder and said batter and catcher, without the direct rays of said latter beam of light falling low enough to strike into the eyes of said batter and catcher.

7. In a system for illuminating a baseball field, the combination of a source or sources of light, with shades therefor, located in front of and above an infielder and an outfielder and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto substantially all of the diamond, without the direct rays thereof reaching to the eyes of said infielder when outside the diamond or on the base line, and throw another beam of light into the air, over the heads of said infielder and said outfielder, without the direct rays of light falling into the eyes of said outfielder, said two beams of light being separated by a darkened space or area extending from substantially the base line to back of said outfielder, when said outfielder is in his normal position, waiting the striking of the ball, from which darkened space or area said infielder and said outfielder may look toward said light without the direct rays thereof falling into their eyes.

8. In a system for illuminating a baseball field, the combination of a source or sources of light, with shades therefor, located in front of and above an infielder and an outfielder and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto substantially all of the diamond, without the direct rays thereof reaching to the eyes of said infielder, when outside the diamond or on the base line, and throw another beam of light into the air, over the heads of said infielder and said outfielder, without the direct rays of light falling into the eyes of said outfielder, said two beams of light being separated by a darkened space or area extending from substantially the base line to back of said outfielder, when said outfielder is in his normal position, waiting the striking of the ball, from which darkened space or area said infielder and said outfielder may look toward said light without the direct rays thereof falling into their eyes, and another light, located to the side of said infielder and throwing a beam of light over the darkened area in which said infielder stands.

9. In a system for illuminating a baseball field, the combination of a source or sources of light, with shades therefor, located in front of and above an infielder and an outfielder and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto substantially all of the diamond, without the direct rays thereof reaching to the eyes of said infielder when outside the diamond or on the base line, and throw another beam of light into the air, over the heads of said infielder and said outfielder, without the direct rays of light falling into the eyes of said outfielder, said two beams of light being separated by a darkened space or area extending from substantially the base line to back of said outfielder, when said outfielder is in his normal position, waiting the striking of the ball, from which darkened space or area said infielder and said outfielder may look toward said light without the direct rays thereof falling into their eyes, and another light located behind said infielder and said outfielder and throwing light upon the space occupied by said infielder and said outfielder.

10. In a system for illuminating a baseball field, the combination of a source or sources of light, and shades therefor, located in front of the third baseman, and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said third baseman, without the direct rays thereof reaching to the eyes of said third baseman when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said third baseman, without the direct rays of light falling into the eyes of said third baseman; and another source or sources of light, with shades therefor, located in front of the first baseman, and constructed and disposed in such a manner that the light or lights last mentioned throw a beam of light onto parts of the diamond in front of said first baseman, without the direct rays thereof reaching to the eyes of said first baseman, when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said first baseman, without the direct rays of light falling into the eyes of said first baseman.

11. In a system for illuminating a baseball field, the combination of a source or sources of light, and shades therefor, located in front of the third baseman, and

constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said third baseman, without the direct rays thereof reaching to the eyes of said third baseman, when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said third baseman, without the direct rays of light falling into the eyes of said third baseman; another source or sources of light, with shades therefor, located in front of the first baseman, and constructed and disposed in such a manner that the light or lights last mentioned throw a beam of light onto parts of the diamond in front of said first baseman, without the direct rays thereof reaching to the eyes of said first baseman, when in his normal position waiting the batting of the ball, and throw another beam of light into the air, over the head of said first baseman, without the direct rays of light falling into the eyes of said first baseman, and a light or lights located in the outfield, throwing light upon the space occupied by one or both of said basemen.

12. In a system for illuminating a baseball field, the combination of a source or sources of light, and shades therefor, located in front of the third baseman, and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said third baseman, without the direct rays thereof reaching to the eyes of said third baseman, when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said third baseman, without the direct rays of light falling into the eyes of said third baseman; and another source or sources of light, with shades therefor, located in front of the first baseman, and constructed and disposed in such a manner that the light or lights last mentioned throw a beam of light onto parts of the diamond in front of said first baseman, without the direct rays thereof reaching to the eyes of said first baseman, when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said first baseman, without the direct rays of light falling into the eyes of said first baseman, said light in front of said third baseman throwing a beam of light onto the space occupied by said first baseman and said light in front of said first baseman throwing a beam of light onto the space occupied by said third baseman.

13. In a system for illuminating a baseball field, the combination of a source or sources of light, and shades therefor, located in front of the third baseman, and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said third baseman, without the direct rays thereof reaching to the eyes of said third baseman, when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said third baseman, without the direct rays of light falling into the eyes of said third baseman; another source or sources of light, with shades therefor, located in front of the first baseman, and constructed and disposed in such a manner that the light or lights last mentioned throw a beam of light onto parts of the diamond in front of said first baseman, without the direct rays thereof reaching to the eyes of said first baseman, when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said first baseman, without the direct rays of light falling into the eyes of said first baseman, said light in front of said third baseman throwing a beam of light onto the space occupied by said first baseman and said light in front of said first baseman throwing a beam of light onto the space occupied by said third baseman; and a light or lights located in the outfield, throwing light upon the space occupied by one or both of said basemen.

14. In a system for illuminating a baseball field, the combination of a source or sources of light, and shades therefor, located in front of the third baseman, and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said third baseman, without the direct rays thereof reaching to the eyes of said third baseman, when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said third baseman, without the direct rays of light falling into the eyes of said third baseman; another source or sources of light, with shades therefor, located in front of the first baseman, and constructed and disposed in such a manner that the light or lights last mentioned throw a beam of light onto parts of the diamond in front of said first baseman, without the direct rays thereof reaching to the eyes of said first baseman, when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said first baseman, without the direct rays of light falling into the eyes of said first baseman, and another source or sources of light, with shades therefor, located in the outfield, and constructed and disposed in such a manner that the light or lights throw a beam or beams of light onto the space occupied by one or both of

said infielders, without the direct rays thereof reaching to the eyes of the catcher or batter, and throw a beam or beams of light into the air, above the head or heads of said baseman or basemen, without the direct rays thereof falling into the eyes of the catcher or batter.

15. In a system for illuminating a baseball field, the combination of a source or sources of light, and shades therefor, located in front of the third baseman, and constructed and disposed in such a manner that the light or lights aforesaid throw a beam of light onto parts of the diamond in front of said third baseman, without the direct rays thereof reaching to the eyes of said third baseman, when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said third baseman, without the direct rays of light falling into the eyes of said third baseman; another source or sources of light, with shades therefor, located in front of the first baseman, and constructed and disposed in such a manner that the light or lights last mentioned throw a beam of light onto parts of the diamond in front of said first baseman, without the direct rays thereof reaching to the eyes of said first baseman, when in his normal position, waiting the batting of the ball, and throw another beam of light into the air, over the head of said first baseman, without the direct rays of light falling into the eyes of said first baseman, said light in front of the third baseman throwing a beam of light onto the space occupied by said first baseman and said light in front of said first baseman throwing a beam of light onto the space occupied by said third baseman; and another source or sources of light, with shades therefor, located in the outfield, and constructed and disposed in such a manner that the light or lights throw a beam or beams of light onto the space occupied by one or both of said infielders, without the direct rays thereof reaching to the eyes of the catcher or batter, and throw another beam or beams of light into the air, above the head or heads of said baseman or basemen, without the direct rays thereof falling into the eyes of the catcher or batter.

16. An apparatus for illuminating a baseball field at night, including a lamp and means for supporting said lamp in a position in front of and above the normal position of an infielder on said base ball field, said lamp being constructed substantially in the manner before described, so that it throws two distinct beams of light, namely, one beam of light onto a part of the diamond in front of the normal position of the infielder aforesaid, but at such an angle that the direct rays of said beam do not reach the eyes of said infielder when in his normal position; the other beam of light aforesaid being thrown by said lamp more nearly horizontally, so that the said beam passes above the head of the infielder aforesaid and of an outfielder substantially back of said infielder, when standing in their normal positions, at such a height that its direct rays do not reach the eyes of said infielder or said outfielder; the two beams of light aforesaid being thus separated by a dark space or area, in which the infielder and the outfielder stand when in their normal positions, whereby said infielder and said outfielder can look toward the lamp aforesaid without the direct rays thereof striking into their eyes.

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

GEO. F. CAHILL.

Attest:
ARTHUR T. CAHILL,
MARY H. CAHILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."