

POWERFUL SEARCHLIGHTS WORK WONDERS IN MODERN WARFARE.

In modern warfare some of the greatest battles are not fought in the daytime, but at night, when darkness provides a mighty impenetrable blanket over land and sea. For that reason the enormous armies now engaged in the titanic struggle in Europe invoke the use of powerful electric searchlights which blaze forth over the battleground at night, so that advances and sorties may be made regardless of nature's handicap. Our illustrations show a clever method for handling, to the best advantage, a powerful electric searchlight projector and, moreover, its mounting is cleverly placed on a specially constructed wagon, as perceived. This vehicle carries at the rear two large reels of flexible cable, which serve to supply the arc lamp with current from a petrol engine and dynamo plant similarly mounted on a wagon, but located in most cases at some distance from the projector.

When the searchlight wagon has reached the point where it is to be used on the field the telescopic, collapsible framework here shown is elevated in a few seconds to any desired height and the searchlight can now be swung to whatever direction desired. A flexible electric cable leads down from the projector case to make connection with the wires leading back to the dynamo truck, as aforementioned.

This outfit is also equipped with a military type telephone instrument, whose circuit runs back to the rear army guard. Note how the truck is partially covered with pine boughs in an effort to conceal the outfit as much as possible from the reconnoitering aeroplanes of the enemy during daytime. Some of these schemes are carried out in such detail that the apparatus cannot be observed at all, even when the scouting aeroplane flies but a short distance above the earth. The particular searchlight here shown has done effective duty in Northern France, and, as may be

judged from the pictures, this unit forms a part of the wonderful German signal corps equipment, which is said on good authority, to be second to none in the world to-day. It must be remembered that in most instances, not one or two searchlights are used on the battlefield, but whole

sums from 5 to 15 kilowatts. Some searchlights require less, where they are used for minor work, and likewise some of them take more energy than above mentioned. The American Army and Navy are equipped with some of the largest projectors extant, several of which measure 60 inches



Above: German Signal Corps About to Put Into Operation One of Their Powerful 36-inch Electric Searchlight Projectors for Night Fighting. Left: Supporting Frame Elevated. Note Screen of Trees to Help Disguise It From Enemy During Day.

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batteries of them are brought into play simultaneously, so that the ground is brilliantly illuminated for several miles, thus for all practical purposes they take the place of the sun itself. Occasionally one of these powerful searchlight beams spots an enemy's aeroplane at night, and in several instances it has resulted in the flying scout being brought to earth in short order by the effective use of anti-aircraft guns.

The majority of these devices operate on 80 to 110 volts, direct current, and con-

and more in diameter across the reflector. The front opening of the lamp cases are closed with glass, but this is not in one piece. It is divided up into several narrow strips to permit greater facility in replacement, and also to more efficiently take care of the unequal expansion and contraction of the glass, due to the enormous amount of heat developed by the arc, and which is moreover reflected against the glass by the parabolic mirror in the rear of the lamp housing.

HOW THE WIRELESS "WIZ" CELEBRATED XMAS.
(Continued from page 390.)

"Well, see you later in the day," I sang out. * * *

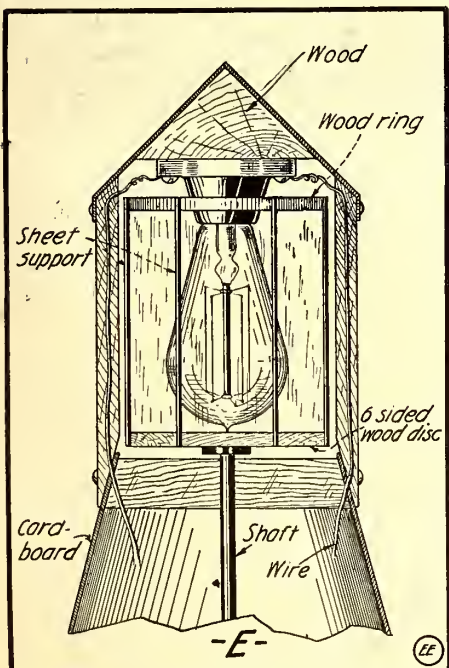


Fig. E. How Revolving Flasher of Searchlight is Constructed.

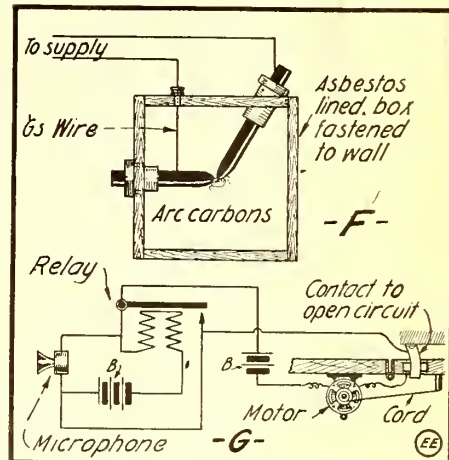
"Are you ready for the dope now?" inquired the "Wiz" that night at 11, as he sank into the chair at his desk and drew forth a few sheets of blank paper, on which he proceeded to make some sketches. "Well, I'll now 'wise you up' on the railroad stunt first. I was certainly stuck for a while on the switches for this system, till I got into communication with a New York electrical firm and managed to get hold of a complete list of miniature railroad supplies to fill my bill. I used two stations—'A' and 'B' (see sketch A)—and one siding made of standard track.

"The three switches were electrically operated from the switchboard and were made similar to this sketch B. Two magnets were mounted with a pivoted magnetized arm to play between them. This pivoted arm was fastened to the bar that swung the switch, and by throwing the current in one direction or the other I was able to open or close the switch.

"The third rail on the side-track and stations was disconnected from the main system, and I had switches 1, 2 and 3 arranged to control them, while switch 4 controlled the current to the main track. The electric switches 5, 6, 7, 8, 9 and 10 controlled the operation of the track switches. I also rigged up magnetically controlled reversing stops at several points, marked X, controlled by keys 11, 12, 13, 14, 15 and 16. These reversers also operate the semaphores by means of the sliding rod, 'R,' pushing the arm into 'Danger' position.

"Now the operation of the system can be briefly outlined as follows: Making the freight train's station, 'A,' and the express

train's station, 'B'; then, by closing the switch 1, the freight train is started out on the main track and runs in the direction indicated by the arrow. When it has just passed the express station we may throw the current into that track by closing the switch 2, and the express train will



Figs. F. and G. Details of Electric Arc and Microphone Control Relay Used to Open Door.

start out in the opposite direction. It will look just like a head-on collision, but by depressing the key 9 the switch is opened that allows the freight train to run onto the side-track; and the button 14, controlling the reverse, is pressed at the same time and the reverse gear will cause it to
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