

A COMBINED LONG AND SHORT RANGE AUTOMOBILE SEARCHLIGHT.

An automobile searchlight, called the Besnard projector, has just been brought out, which is provided with means for suppressing, at will, the blinding effects of such lights. The optical part of the apparatus comprises a lens of long focus and a hyperbolic reflector. Optical diagrams of this reflector are represented in Figs. 1 and 2, which show that the projector is capable of casting both a long-range beam and a short-range or local cone of light. As shown in Fig. 1, the rays of the powerful long-range beam are rendered parallel by a lens and a hyperbolic mirror M :

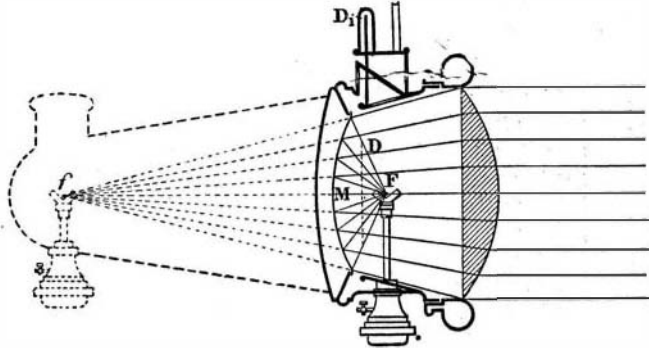


Fig. 1.—Diagram of Arrangement for Long-Range Illumination.

The combined effect of the lens and mirror is to project the rays as if they emanated from the common focus f , whereas the flame is actually located at the second focus F of the hyperbola. Due to this arrangement, it has been possible to utilize a powerful lens of wide diameter on a projector of comparatively small size. The dotted lines of Fig. 1 indicate the cumbersome dimensions that would be possessed by the projector, were the hyperbolic reflector not used. Fig. 2 shows the effect of the lens upon the rays coming directly from the flame F , which are refracted in a divergent beam that produces a very brilliant and spreading light in a zone near the vehicle.

The long-range beam and the local cone combine, as in Fig. 3, to form a stream of light that overspreads the entire road from the origin of the luminous cone in front of the carriage to a very great distance ahead. The short-range light provides a luminous cone of such an extent as to permit of seeing objects in the immediate vicinity of the automobile, and this proves very useful on mountain or winding roads or at dangerous turns. The illuminating power of the long-range beam has its disadvantages in certain surroundings. For example, pedestrians in cities are discommoded by the glare of the searchlight to such an extent, that Paris and several other municipalities of France have been compelled to forbid the use of blinding lights within the corporation limits. Then, again, it is apt to frighten horses and cause serious accidents. Finally, there is no chauffeur who has not himself been blinded by the searchlight of an oncoming automobile at the moment when it was most necessary for him to attend to his steering.

A very ingenious arrangement applied to the projector permits of obviating such inconveniences. In Fig. 1 a disk is shown which may occupy either the dotted position D , behind the flame, or that of D_1 indicated by full lines in the top of the lamp. In the first position D , the disk intercepts the luminous rays which are directed toward the reflector, and thus suppresses the powerful long-range beam of light. However, the local illumination (Fig. 2) persists, and permits the driver to make his way in a lighted city, or even on the highway at a reduced speed. If, on the contrary, the disk be raised to the position D_1 in the top of the lamp, the entire light of the projector will be brought into play. Fig. 3 shows the intense light that the projector throws upon the road when in full operation, and Fig. 4 the non-blinding light produced after the disk has been lowered.—Translated from *L'Automobile* for the SCIENTIFIC AMERICAN.

The Kashmir electric supply machinery will be made in America.

Japan's Merchant Marine.

Since the close of the war with Russia, Japan has entered actively upon the extension of its merchant marine, and there are indications of a purpose to make the Japanese flag supreme in oriental waters. Consul-General Rodgers, of Shanghai, furnishes an interesting report on this matter, which follows:

During the period of comparative quiet which followed the practical end of the war in early June and continued until the signing of the peace treaty there was little evidence of the present-day activity in the Japanese shipping business, but now it is apparent on every side and is especially noticeable in Shanghai, a port which will be used more in the near future by the Japanese than perhaps any other nation. The magnificent water front owned by the Nippon Yusen Kaisha (Japanese Steamship Company), formerly the property of the Pacific Mail Steamship Company, from which it was bought for a small portion of its present value, is occupied by a long line of pontoons and godowns, and from and to these a constant stream of cargo is being handled by Japanese steamers of light draft, which are not hindered by the Whangpoo bar. The regular and subsidiary ships of the Nippon Yusen Kaisha are being added to by coasting ships which will ply in all directions, even the Yangtse service having been entered with determination. The activity of the Japanese carrying trade to the north is marked, and but recently, by the institution of an agreement

between the Nippon Yusen Kaisha and the Deshler Line (under the American flag), of Kobe, there is provided a weekly service to all Korean ports via Moji, with Kobe and Shanghai as the terminal points. It is well understood that the Japanese are determined for the present to make Kobe and Moji their great shipping ports, and that Shanghai will be their Chinese base.

The news of the intentions of the Japanese as to their merchant marine of course is at second hand in Shanghai, but semi-official announcements have been made that every port touched by Pacific waters will soon be reached. It is known that a line from Hongkong to Australia, via Manila, will soon be developed into a rival in importance of the trans-Pacific. In the meanwhile the shipbuilding companies of Japan are building new vessels, repairing old ones, altering captured craft, and in every way preparing to adapt everything they have afloat to the new field of Japanese endeavor. If the half that is told of Japanese intentions as to merchant marine is true, then an

activity will ensue on the Pacific Ocean which will astonish the world. It is too late this year to get the full development, but one year from now, unless unforeseen causes intervene, there will be a wonderful Japanese fleet afloat, and every one of the nations which have practically monopolized the sea traffic in the Orient will have to look to its laurels.

This anticipation, which is current in Shanghai especially, is causing great uneasiness for the reason that many see in it a promise of the necessity for a frequent readjustment of freight tariffs and, a conse-

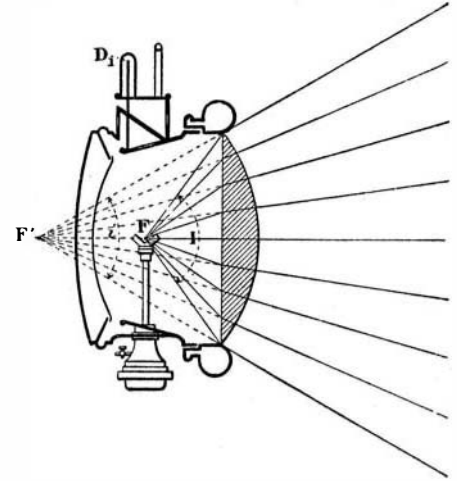


Fig. 2.—Diagram of Arrangement for Short-Range Illumination.

quent diminution of profit. At present there is some uncertainty as to these tariffs, the war rates having been abated as necessity demanded. Those best informed predict entire new schedules, and it is certain that many new plans will have to be inaugurated to meet the competition. Whether Japanese vessels can be successful under these conditions is another question entirely. Many well-informed persons argue that they cannot; that the thing will be overdone and will be ruinous to them. It is also asserted that the Japanese cannot operate ships as economically as Europeans, and that there is no special advantage in their favor. But whatever may be the financial outcome to the Japanese, it is entirely probable, in view of all the conditions, that some of the large shipping firms, and especially the American trans-Pacific lines, will, in the near future, proceed upon a different programme and require ships of smaller tonnage for China coast

service. Not alone on salt water is Japan making her advance. On the Yangtse she will certainly have a large fleet and upon the smaller rivers and canals as well. The carrying trade at Hangchow via the Whangpoo and the Grand Canal she already shares to a great extent, the service being conducted by small towing launches and lorchas. Soochow, Huchow, and other canal cities will also receive attention, and it is understood that her small coasting ships to places like Ningpo with be numerous. The Chinese apparently offer no impediment to these plans; on the contrary, they appear to welcome them. In no way is the evident determination of Japan to inaugurate a commercial conquest of the Orient more apparent than in the announced diffuse intentions of her merchant marine. Instances to prove this are plenty. In fact, one has but to inspect the present sailing lists of the Osaka, Shosen, and the Nippon Yusen Kaisha and its allied lines to note that not a route has been forgotten at present. And in addition to that it is well known to everybody that the shipyards of Japan are the busiest places in the East to-day. The tonnage being prepared for service is enormous and the work goes steadily on. No other city in China will feel the effect of this invasion as will Shanghai.

The highest recorded velocity of underground water is said to be 144 feet in twenty-four hours. The new record is for water flowing through gravel near Tucson, Arizona. The observations were made during the last Christmas holidays by Mr. H. C. Wolff, of the Department of Mathematics of the University of Wisconsin.

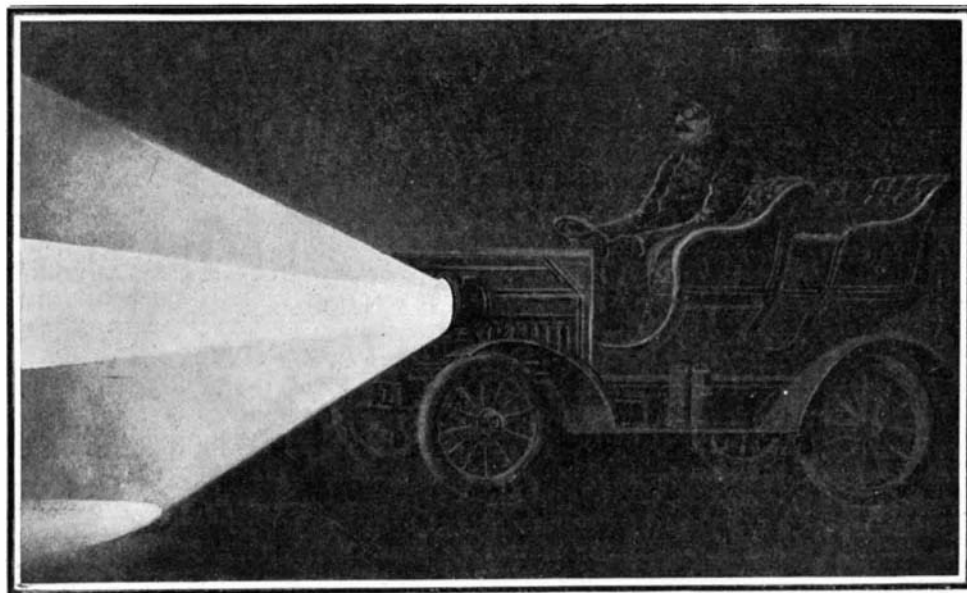


Fig. 3.—The Brilliant Illumination Produced by the Combined Long and Short Range Beams.

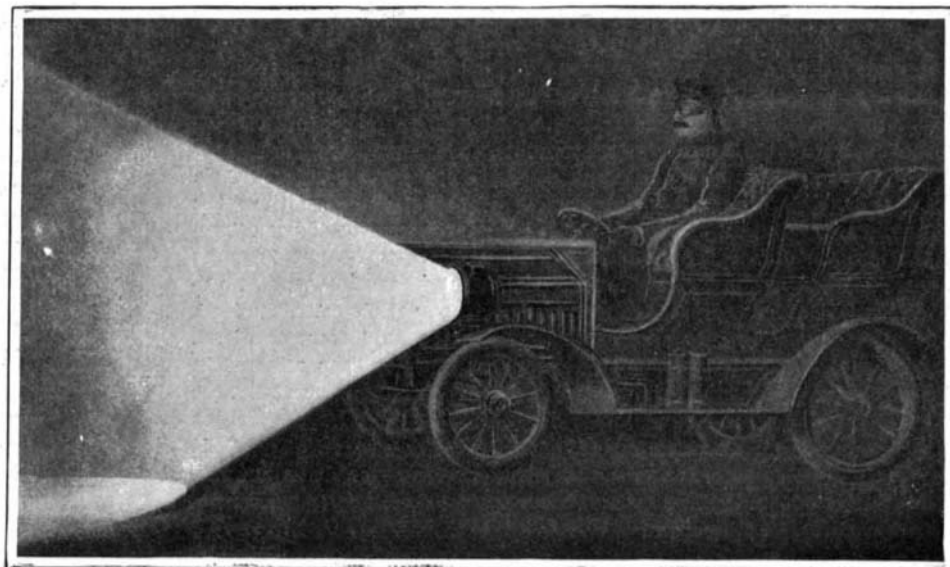


Fig. 4.—Lighting the Road With the Short-Range Beam.