

AN AUDIBLE AND VISIBLE RAILWAY SIGNAL FOR GRADE CROSSINGS, OPERATED BY A HIGH TENSION CURRENT.

BY EMILE GUARINI.

Among the novelties recently introduced by Siemens & Halske, of Berlin, is a new system of alarm signals for railway crossings at grade. The signals are both visible and audible.

Upon a single-tracked road running from Paderborn to Brackwede, the device was set up and tested, giving satisfactory results since its installation. The apparatus is automatic, and in general resembles ordinary signals exteriorly, but it contains within its iron envelope a small high-speed electric motor which, by means of a rack, actuates a hammer that strikes a bell.

To avoid the use of resistances in reducing the tension of the current from 500 volts to something more suitable for the motor, incandescent lamps are cut in the circuit. Thus it happens that the audible signal receives a complement by the addition of a visible one. Three of the four lamps are placed in the lantern which ornaments the top of the apparatus situated at the danger point or point of crossing, while the fourth lamp is set up in the nearest station and serves to inform the station agent that the appliance is doing its duty properly.

Lamps of 16-candle power are used for this purpose. When the lamps are illuminated, there appear upon the face of the lantern the words, "Zug kommt" (train is coming), which under other conditions are invisible.

One of our views shows the apparatus closed and in working order; the other furnishes a detailed view of the motor and lamps. The cutting into the electric circuit of the automatic motor is accomplished by the approaching train through the medium of three contacts placed at suitable intervals on the track. In passing over the first contact the alarm is set in motion and the sign "Zug kommt" illuminated. The passage of the train over the second contact cuts out the alarm and illuminated sign, and when the wheels of the train pass over the third contact after passing the crossing, the parts of the mechanism are returned to their state of rest or normal position; the lamp at the station is extinguished and the commutator takes up again its original position.

WATERWAY IMPROVEMENT ON THE OHIO.

BY WILLIAM GILBERT IRWIN.

One of the most interesting phases of the marvelous development of our internal commerce during the past ten or twenty years has been the growing importance of the Ohio and its tributaries, the Ohio and Mississippi to-day forming the greatest internal waterway system in the world, with the possible exception of that formed by the Great Lakes. This rapid development of the Ohio as a carrier of commerce has been largely due to the great industrial development which the Ohio Valley has been undergoing during the past ten or twenty years. Just as the Upper Ohio Valley is to-day the center of the iron and steel trade of the world, and at the same time the greatest producer of coal and coke, so, too, does the vast amount of traffic which has brought this stream to the front rank among the internal waterways of the world originate in the Upper Ohio Valley—Pittsburg and adjacent sections embraced in the Pittsburg district, together with southern Ohio and the northern part of West Virginia, contributing the major portion of those varied commercial products which give the Ohio a vast annual traffic. The Pittsburg district to-day

possesses more industrial superlatives than are to be found on any other similar area on earth. This district has the greatest iron and steel works, the greatest electrical plants, the largest glass houses, firebrick yards, potteries, etc., and at the same time is the center of the world's greatest coal and coking fields.

Save for the shipping facilities afforded by the Ohio, all the vast traffic radiating out from this district is

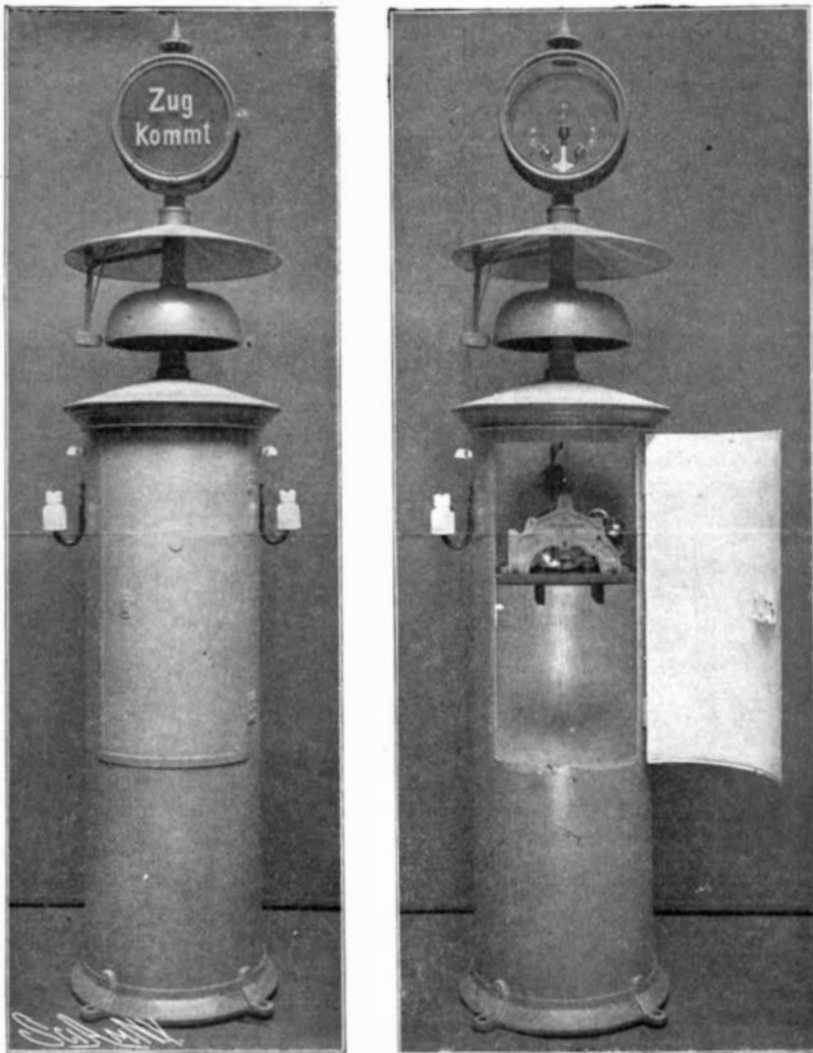
tates other than railway facilities for its handling.

While the Ohio has been utilized for transportation purposes to some extent from the earliest days, yet until a comparatively recent period, and even at the present day, this commercial highway has not been improved to that state which those interested in this form of traffic have desired. But what has already been accomplished has been responsible for making Pittsburg, although wholly an inland city, the fifth commercial port in this country in point of tonnage, its annual river traffic being exceeded only by New York, Baltimore, Chicago, and Buffalo. With Pittsburg the fifth commercial port of this country under the present circumstances, when the Ohio and its tributary streams are open to navigation only about eight months in the year, some conception can be formed of what benefits will be conferred on this city when an all-year-round shipping stage is established on the Ohio, and when the government dams and locks are enlarged to accommodate the great freight steamers which are now being constructed for this traffic.

The navigable course of the Ohio extends from Pittsburg to the Mississippi, a distance of nearly 1,000 miles. The Monongahela is navigable a distance of about 150 miles above Pittsburg, and the Allegheny, which with the Monongahela forms the Ohio, is at present navigable about thirty miles above Pittsburg, while improvements under way and contemplated will give that stream more than one hundred miles of navigable waters. The Muskingum in Ohio contributes 75 miles of navigable waters to the Ohio River system. In West Virginia the Kanawha is navigable 10, 150 miles, the Little Kanawha for 102 miles, and the Big Sandy for 50 miles. The erection of government dams and locks will add more than a hundred miles of navigable waters to these streams. The White River in Indiana is navigable for 50 miles, and in Kentucky the Ohio has in the Green, Kentucky, Tennessee, and Cumberland navigable tributaries with an aggregate length of more than 1,200 miles. The Ohio-Mississippi system from Pittsburg to New Orleans has a length of about 1,400 miles, and the navigable tributaries of the Ohio have an aggregate length of more

than 1,800 miles, giving this internal waterway a length of more than 3,200 miles, while improvements now under way or provided for by the government will add probably 300 miles of navigable waters, and within a few years this work will have established an all-year navigation stage on the Ohio throughout its entire course.

The improvements on the Ohio up to this time consist of eighteen locks and dams, a number of which are not yet completed, and the Louisville and Portland Canal around the Falls of the Ohio at Louisville. This canal is 2 miles long, and was completed in 1881. It carries a mean annual stage of 12 feet, giving passage to the largest vessels now afloat on the Ohio. The locks are equipped with automatic gates electrically operated, and a traffic of nearly 10,000,000 tons annually passes through the canal, the lockages last year aggregating nearly 8,000. All the dams in operation and building on the Ohio are of the movable type, the Davis Island dam at Pittsburg, which was completed in 1885, being the first dam of that type ever built in this country. This dam is of the wicket pattern, the wickets being lowered at times of high water, leaving an unimpeded channel. A very full description of the mechanism of a very similar movable dam was given in a former number of our SUPPLEMENT. The dam consists of a number of wickets, each supported, when raised, by a prop which catches at the bottom in a step of a hurter.



A NEW RAILWAY SIGNAL.

marketed by way of the railroads. Consequently Pittsburg has become the greatest center of railway traffic on the globe, the various roads entering this city being continually congested with the great volume of traffic. They are the best paying ones in operation. There was a time when the railway interests were opposed to the improvement of the Ohio with a view to making it a commercial stream, but long ago such opposition has disappeared, and it is now fully realized that the vast traffic of this district necessi-



Coal Fleets at Pittsburg Ready to Start Down the Ohio River.

WATERWAY IMPROVEMENT ON THE OHIO RIVER.