

has under consideration some improvements that will increase the capacity, but nothing definite has been decided. The company has of late installed electric power for its entire plant. Its present business consists in making highway bridges and structural work, mostly factory buildings, public buildings, street car barns and the smaller class of railroad bridges.

At Elkhart, Indiana, the machinery of the new plant of the Elkhart Bridge Company was started on March 17, and it is expected to have the full plant in operation within a few days. The plant covers four acres. The machinery is all driven by electric motors. F. W. Fahgren is the General Superintendent.

Another Indiana company that has increased its capacity 50 per cent. in two years is the Attica Bridge Company. The company has just finished improvements at a cost of \$7,000.

In the northwest, where more steel highway bridges are being built than formerly, the bridge plants have also been enlarged quite materially in the past two years. The Wisconsin Bridge & Iron Company at North Milwaukee has increased its capacity 40 per cent. in that period; the works now having an annual capacity of 15,000 tons.

The plant of the American Bridge Company at Milwaukee, formerly the Gillette-Herzog Mfg. Co., is to be greatly enlarged, probably doubling the present capacity.

The Modern Steel Structural Company at Waukesha, Wis., is a new concern, and has a plant that will turn out 500 tons a month. The only improvement made at the works since the completion was the addition of a small power house.

The Groton Bridge Company, at Groton, N. Y., is also a new company just starting in business. It is now erecting shops which, when completed, will have a capacity of about 2,000 tons per month, but it will be some months before it will be able to do any great amount of business.

The capacity of the bridge works of the Passaic Rolling Mill Company at Paterson, N. J., is about 12,000 tons

Of the recent reports of contemplated bridge plants, one says that the Penn Bridge Company at Beaver Falls, Pa., is considering increasing its capital to make extensive additions to its plant, but the company tells us that it is not ready to give out information. Another report is that the LaBelle Iron Works, of Steubenville, Ohio, will extend its Wheeling, W. Va., plant and make structural steel.

Signaling and Interlocking.*

How to effect a saving is a problem always to be solved, but it frequently happens that the solution does not depend upon individual effort. This is the case as it stands to-day with regard to the adoption of standard designs at joint interlocking plants. There must be an organized effort on the part of all the roads concerned if anything of importance is to be accomplished. With this idea, the Committee has made an effort to get an expression of opinion from 43 railroads by sending to each a set of six prints selected from the drawings prepared relating to the appliances involved at these plants. The railroads were asked to send prints of their own standards covering the same and to make suggestions and recommendations on those sent them. These plans were sent out during February, too short a time before this meeting to get enough answers for us to report upon, but the few we have received lead us to believe that the idea will receive general endorsement and that the answers will enable us to come before you next year with plans and specifications in proper shape to recommend to the Association for adoption. Power-plant systems, automatic block systems, electric locking, and the question of a time release as a substitute, are live subjects, and a study of which equipment is best suited for certain arrangement of tracks and switches and traffic conditions will be made and reported upon.

On the subject of standard designs and specifications for interlocking plants, the Association's opinion was

as to whether they would recommend or adopt the continuous light principle. This matter has been before the Association for two years and we find that the manufacturers are not giving the attention to the continuous light principle that we believe the matter deserves.

President Kittredge: This committee has been most unfortunate. It has had during the year some three or four different chairmen, and the last resignation came so late that it was impossible for the present committee to make more than a start.

Mr. Wendt: The Chairman of the committee asks that the Association express its views with regard to the continuous light principle. It would be well to have that submitted to the members of the Association by ballot during the year, as undoubtedly most of the members in attendance upon the convention are not prepared to vote on the question. (Moved and seconded).

Mr. H. D. Miles (M. C.): Do they also care to have the Association consider the question of the position of the arm signals? That point, as well as the question of continuous light, affects the design of the signal arm casting. In considering one both should be considered. I question whether the committee will get much benefit from that unless they send out drawings with the request for letter ballot. The committee previously had considerable trouble in getting any expression of opinion. The members of the Association are not, many of them, very familiar with signaling, and that was one of the drawbacks in considering the subject.

Mr. Wendt accepted an amendment that the committee be instructed to prepare and submit the question of the position of the arms, and of continuous light.

Mr. Cushing: When the committee sends out questions with regard to the position of arms it is well to present it by diagrams. As to the continuous light principle I think it would be well to have the chairman of the committee elaborate a little on what the committee considers its advantages. We who have not used it do not see any, but are open to conviction.

Mr. J. C. Mock: The continuous light principle seems to have advantage because many signals are used as semi-automatic, and in times of snow and sleet the arm is liable to droop sufficiently to show a white light, so that any slight derangement from the horizontal position gives you a white light. The hiding of the light seems to give no information and is about as dangerous a condition as having no signal. The continuous light is intended to show a danger condition until the signal is entirely clear. The chances are that the signal will not remain in that extreme position if any derangement occurs. It may get in the middle position or go to "Danger." The designs are all intended to have it go to danger, but there are many things that might conflict with that, as a broken wire, which will allow the signal to go partially to "Danger," but it meets an obstruction and holds it in a middle position. In that case you get a danger indication, which you should get, whereas if you didn't have continuous light, you would either get no light or a white light.

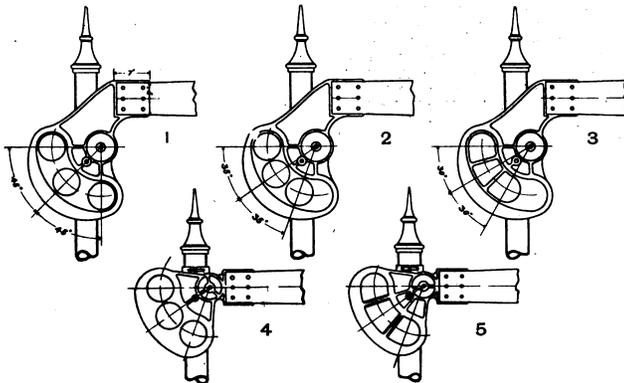
Mr. Cushing: The continuous light principle is not necessary to cure the difficulty. It has been cured by the addition of a small shield as a continuation of the casting. The continuous light plan, as proposed, necessitates the use of extra glass, which is subject to being broken.

Dr. Lardner and Trans-Atlantic Steaming.

Everybody who has had much to do with inventors has, time and again, been confronted with the story that Dr. Lardner proved conclusively that it was a physical impossibility for a steamship to cross the Atlantic Ocean. We have long doubted the fact and generally failed to see the analogy, and an investigation of Dr. Lardner's works shows that he never attempted to demonstrate any such proposition. In fact, in a public lecture given in the United States he denied ever having made a statement to that effect.

The story originated in 1837, at which time Dr. Lardner delivered an address before the meeting of the British Association in Bristol on the Atlantic steam question. Two projects had been started, one advocating the establishment of a line of steamers between the west coast of Ireland and Boston, touching at Halifax, and the other a direct line between Bristol and New York. Dr. Lardner strongly urged the advantage of the former line and, by comparison, deprecated the project of the direct line. The rumor immediately spread all over the world that Dr. Lardner had pronounced the Atlantic steam voyage impractical. He was quoted as saying that it was a mechanical impossibility, that the project was chimerical and that we might as well attempt to steam to the moon as to New York. There was probably no man in England who was better informed on the steamship question than Dr. Lardner, and such a statement from him at this time appears absurd on the face of it. Besides, the steamer "Savannah" had crossed the Atlantic from Savannah to Liverpool as early as 1819, nearly 20 years before the story originated.

Dr. Lardner did make some statements in the nature of predictions at this meeting which are all the more interesting because they were confirmed to the letter during the years that followed. His proposition was that the successful establishment of a permanent and regular line of steamers running throughout the year from Bristol to New York was extremely doubtful in the state in which the art of steam navigation then was, for the simple reason that such a line would not be a profitable financial investment. On the other hand the route from



Proposed Standard Semaphore Castings.

per annum. In the last two years the works have been modernized by improved arrangement and addition of new tools and some extensions to buildings. Some quite extensive additions are proposed, but the plans are not yet fully decided upon.

The Phenix Bridge Company, at Phenixville, Pa., whose works were started in 1790, at which time they consisted of a rolling mill and nail factory, is now the largest concern outside the American Bridge Company, making its own steel and all parts which go to make a complete bridge. The latest improvements to the Phenix Bridge works, that is, 1898 up to date, consist of four new 40-ton open-hearth furnaces and two four-hole soaking pits for the steel department and additional gas producers and boilers; the open-hearth department being equipped with electric charging machines and with electric traveling cranes for charging and drawing ingots in blooming mill.

The beam mill has been entirely remodeled, the equipment consisting of two heating furnaces with capacity of 35-tons each of blooms, the blooms being charged into and drawn from the furnaces with a Wellman-Seaver charging and drawing machine, in connection with transfer car, which are all electrically driven. The rolls are driven by a pair of Mackintosh, Hemphill & Co.'s reversing engine, 28 in. x 48 in. cylinders. All the material is handled at the rolls by a pair of Wellman-Seaver electrically driven tables, it being one of the most complete mills of its kind in the United States. The product of all the mills is loaded directly on cars from the cooling pits by electric overhead traveling cranes.

In the bridge shop, electric cranes have been installed and heavier machinery added, a number of machines being driven by individual electric motors. These improvements have doubled the capacity of the works until at present they are turning out 150,000 tons a year. The hydraulic department of the Phenix Bridge Co. is capable of forging the largest eye-bars ever made, one of which was illustrated Jan. 31, p. 73. The testing machine of the Phenix Bridge Co. is the largest in the world, 2,000,000 lbs. capacity both for tension and compression.

asked at the last meeting about the desirability and practicality of adopting a single type of fixed signal for all interlocking and block purposes. We present the question again for consideration. In respect to its desirability we have this to say: Over one hundred designs of semaphore castings are now on the market and in use, many of which are bad and do not embody correct principles. The good ones differ in unimportant details. We demonstrate the practicality of a standard design in the attached sketch. It has been customary to consider a different design necessary for different degrees of travel of the signal arm and light casting. Figs. 1, 2 and 3 illustrate a form of casting adapted to the three-position signal, and the two-position signal with 90 deg., 70 deg. or 60 deg. travel, the only difference being that a separate spectacle is required for each. The castings are shown mounted on side bearings, but they are equally well adapted to the center bearing. The only change required is the lamp bracket.

Fig. 1 is the only one that does not show the continuous light principle; but this can easily be included by use of glasses shaped as shown at Fig. 3. Fig. 4 shows the same type as Fig. 5, but with round glasses. If any road prefers to carry less glass in the semaphore casting, the center light may be made blank. All are designed to take a green glass, should that color be adopted for the clear indication.

This report is signed by J. C. Mock, Michigan Central; J. W. Thomas, Jr., N. C. & St. L.; T. S. Stevens, Santa Fe, and A. H. Rudd, Lackawanna.

DISCUSSION.

Mr. J. C. Mock (M. C.): The committee held but one meeting, the chairmanship coming to me at a late date, and it would be hardly possible to make a report that would be satisfactory or to make recommendations which we would want the committee to take final action on. We would like to have an expression from the Association

*Extracts from the Report of the Committee of the American Railway Engineering and Maintenance of Way Association, March, 1902.