New Haven Car Register Co., New Haven, Conn.—Single, double and triple fare registers.

New York Belting & Packing Co., New York City.—Interlocking rubber tiling, "Vulcan" spiral piston packing and "Ruby" sheet packing; also moulded rubber work and matting for street cars.

New York Car Wheel Works, Buffalo.—Car wheels and axles.

R. D. Nuttall Co., Allegheny, Pa.—Barrett patent compound lever jack, gears, pinions, bearings, trolley poles and harps; materials for overhead line construction.

Ohio Brass Co., Mansfield, O.—Complete exhibit of overhead line material, including both old and new styles of hanger bodies, eight varieties of trolley ears, bell-metal bearings and special feed-wire insulators and splicers. Also complete set of fittings for putting up "Fig. 8" trolley wire, track brush holders and special insulators for use in mines.

Partridge Carbon Co., Sandusky, O.—Self-lubricating motor brushes.

Arthur S. Partridge, St. Louis.—A general line of street-railroad supplies, including mica, Micanite, insulated wires, carbon brushes, gears, pinions and bearings.

Peckham Motor Truck & Wheel Co., Kingston, N. Y.—Ruggles' "Rotary" snow plow, 7C "Excelsior" truck with the Kilgour emergency brake; 8A "Improved Standard" truck and No. 14 double cushion "Swivel Truck," "Improved" 9A truck with Westinghouse 38B motors operated by the Shelton rheostat; also 9A truck with Westinghouse No. 12 motors; "Improved Extra Long" 9A truck with G. E. 1,000 motors and electric brakes.

Pennsylvania Railway Supply Co., Pittsburgh, Pa.—Commutators, gears and pinions and general electrical supplies, especially for overhead trolley construction.

Phœnix Carbon Manufacturing Co., St. Louis.—Carbons for electric motors and electric lights.

Pittsburgh Car Wheel Co., Pittsburgh, Pa.—Exhibit of a suspension street-car truck.

Pond Machinery Co., St. Louis.—Steam separators and standard rocking grate bars.

W. G. Price.—Exhibit of the Price drawbar.

Q & C Co., Chicago.—The Bryant and Gold Medal machines for sawing rails; Servis tie plates and Perfection oil purifier.

Ready Rock Asphalt Roofing Co., St. Louis.—Samples of roofing material.

John A. Roebling Sons Co., Trenton, N. J.—The Columbia and Johnson rail bonds for electric roads.

Safety Car Heating & Lighting Co., New York City.—Various types of lamps employed in the use of Pintsch gas on street cars.

Safford & Moore Railway Jack Co., Chicago.—Automatic raise and lower and quick-tripping jacks.

The Sargent Co., Chicago.—Brake-shoe made of hard cast iron with spruce wood plugs and in soft cast iron with wrought-iron inserts; also, open-hearth steel castings and car couplers.

St. Louis Car Wheel Co., St. Louis.—Variety of chilled wheels and castings.

St. Louis Register Co., St. Louis.—Single, transfer, vestibule, Baumhoff double deck and New Numeral fare registers.

Sani ary Car Strap Co., Bayonne, N. J.—Clark's patent hand strap for street cars.

Robert A. Schlegel & Bro., St. Louis.—Ornamental and reflecting glasses for street cars.

Scarritt Furniture Co., St. Louis.—Large exhibit of rattan and plush upholstered seats for street cars.

Charles Scott Spring Co., Philadelphia.—Elliptical and helical springs for street cars, and springs of special design.

Security Bank Note Co., Philadelphia.—Samples of engraved railroad tickets and passes.

Shickle, Harrison & Howard Iron Co., St. Louis.—Open-hearth steel castings of cut split-gears and general machine castings of all kinds.

Shultz Belting Co., St. Louis.—Patented leather pulley covering, rawhide belting and woven link belts.

Charles G. Smith, New York City.—Smith of New York."—Combination lamp frame for electric and oil lamps.

Standard Air Brake Co., New York City.—Single-acting geared compressor, power and hand brakes, controlling head, single-acting axle-driven compressor, electric motor compressor (direct coupled) and the Standard air reservoir automatic controller.

Standard Paint Co., New York.—The "P. & B." electrical compounds for insulating wires and cables and "P. & B." motor cloth.

Standard Underground Cable Co., Pittsburgh.—Large exhibit of wire cables of all sizes.

Steel Motor Co., Johnstown, Pa.—Lombard hydraulic brake, two type C3 controller and two electric motor mounted on trucks.

Sterling Supply & Manufacturing Co., New York City.—Brakes and fare registers.

Stever Rail Joint Co., Canton, O.—Five patterns of the Stever rail joint applied to different style of rails.

D. C. Sweet Co., Springfield, Mass.—Car wheel grinding machines.

Taylor Electric Truck Co., Troy, N. Y.—The Taylor improved single truck and a pair of Empire State radial trucks.

Trojan Button Fastener Co., Troy, N. Y.—Exhibit of the Hale sand box.

Edmund Verstraete, St. Louis.—Electric brake.

Walker Mfg. Co., Cleveland, O.—An 800-K. W. armature (1,000 H. P.) one of 15 built for the Chicago City Railway Co., weighing 27,800 lbs.; Nos. 3, 5, 10 and 15 motors and two No. 3 motors on a Peckham truck; new type "E2" controller; type "G" controller for open elevated trains; new ventilated rheostat and the Walker improved trolley arm and wheel.

Weber Railway Joint Mfg. Co., New York City.—Complete exhibit of Weber rail joints, including several specimens that have been in actual service.

The Wells & French Co., Chicago.—The Chicago street-car truck.

Western Telephone Construction Co., Chicago.—Complete switchboard.

Westinghouse Electric & Mfg. Co., Pittsburgh.—Standard railroad switchboard, with one generator panel, two feeder panels and one panel for bus ammeter and Weston volt meter; switchboard with Wurts automatic circuit breaker and Wurts switch; full line of Wurts non-arcing lightning arresters and tank arresters; two 12A motors on a Peckham truck; one truck equipped with 38B motors; a 15,000-volt, high-potential lightning arrestor; iron-clad field rheostat; generator-equalizer switch, mounted on a stand and one standard street-car choke coil.

William Wharton, Jr., & Co., Philadelphia.—Carves' long radius switch frog for special work, integral and manganese steel and the Wharton unbroken main line work.

White-Crosby Co., New York City.—Samples of tops of poles to be used in the Niagara & Buffalo power transmission line, designed to carry wires to transmit 20,000 H. P. at 10,000 volts, 5,000 H. P. to be delivered to Buffalo by Nov. 15.

Clarence Whitman & Co., New York City.—Samples of Pantasote, an imitation leather for car curtains, upholstering and lining.

Windsor Brake Co., Troy, N. Y.—Model of a patent car brake.

J. H. Wolf & Co., St. Louis.—Samples of transfer tickets now being used by the Union Depot Railroad Co.

Foreign Railroad Notes.

In an account of the Russian Exhibition at Nijni Novgorod, held this year, the following list of the locomotive and car-building establishments in Russia, aside from the shops of the railroads themselves, is given: Kolomna Machine Works, in Kolomna, near Moscow, with an annual capacity of 159 locomotives and 3,000 cars; the Brjansk Works in Bjeschizkaja, on the Riga & Orel Railroad, capacity for 120 locomotives and 3,000 cars; the Putilov Works in St. Petersburg, capacity 100 locomotives and 3,800 cars; the Malzov Works Co. in Brjansk, capacity 1,500 cars; the Lilpop, Rau & Löwenstein Co., Warsaw, capacity 3,000 cars; the Russian Baltic Car Works Co., Riga, capacity 4,000 cars; the CMoscow ompany of the Neva Engine Works, St. Petersburg, capacity 120 locomotives; the Sovmov Co., Nijni Novgorod, capacity 2,000 cars; the Wotkin State Works, Sarapul, capacity 20 locomotives; the Phœnix Co., Riga, founded in 1896. The aggregate capacity of these works is 500 locomotives and 2,000 cars yearly.

At the exhibition the Siberian Railroad had a building by itself for its exhibits, which were very numerous, including the steam car ferry for Lake Baikal, capable of carrying three trains at once, and a curious collection of Chinese tools for earthwork, wheelbarrows, etc., such as are actually in use on the Pacific end of the Siberian Railroad.

The Russian Railroads made a fine exhibit at Nijni-Novgorod, including many appliances by Russian inventors. Nearly all the passenger cars were approximately of the American type, and most of them, even third and fourth class cars, were fitted to be used as sleeping-cars. There was a great variety of special freight cars for carrying stock, racehorses, fish, fruit, milk and beer and hospital cars, including some intended for patients affected with contagious diseases.

A list of the street railroads in Russia on the 1st of August last has been published, showing an aggregate of 366 miles in 19 different cities. Most of them are still worked by horse-power, but there is a line 5¼ miles long in Moscow, one 4and and one 2¾ miles long in St. Petersburg and one 6¾ miles long in Odessa, which are worked by steam, while all the lines in Kieff (21 miles) and all those in ancient and oriental Nijni-Novgorod (8¾ miles) are worked by electricity. In St. Petersburg there are 66 miles and in Moscow 76 miles of horse railroad, in Warsaw 50 miles and in Odessa 35 miles. The place which stands next is Asiatic Tiflis, with 13 miles. In Nijni-Novgorod there are two mountain railroads up steep hills.

The Berlin Exhibition recently closed, was held on grounds to the east of the city on the line of a girdle railroad which encircles it. The oval space included by this girdle is nearly bisected by the elevated City Railroad. The time-table of the City Railroad and of the Girdle road, worked together as one system, was arranged particularly for the exhibition this year, most of the trains running directly to the grounds, which were one station to the south of the eastern junction of the City road with the Girdle. By the exhibition time-table, the number of trains to and from the grounds was 761 on week-days and 931 Sundays. Since the close of the exhibition the number is 304 on week-days and 279 Sundays. Trains were run at times only three minutes apart. The largest number of passengers carried to and from the exhibition by railroad in one week was 467,500.

Freight Stations for Local and Transfer Work.

BY O. P. L.

A recent article in the Ohio *State Journal* states that the Pennsylvania Lines west of Pittsburgh are "arranging to make Columbus the distinctive transfer station" for their southwestern system. It goes on to say that "the local station is not to be abolished, but that the facilities for handling local freight are to be improved." The article then proceeds to boom Columbus and the Pennsylvania Lines in a manner more enterprising than interesting, but I gather that the Pennsylvania is able in Columbus to combine the business of its local freight station with that of a freight transfer station. This means that it has command, in a location convenient for the local merchants, of more land than is necessary for the local business. Probably this is more easily managed at Columbus than at larger cities where land is dearer, but if the facilities are properly used, they should be of advantage both to Columbus and to the railroad.

Supposing that the new freight-transfer station attracts to Columbus all the freight for the local points within a radius of a hundred miles or so, this increased amount of "Columbus freight" will enable freight agents at a distance to load direct to Columbus most of the freight which hitherto has gone to intermediate transfer stations. In like manner, Columbus will be able to load through cars to many distant points to which it could not afford to send cars if the volume of business were smaller.

The movement of freight "through without transfer," which was the original drawing card of the fast freight lines, is still of importance to the merchant; and the greater the amount of other people's freight transferred *at* Columbus, the less will the freight of the Columbus merchant be transferred. This is a clear gain to him.

In all probability the new freight to be transferred at Columbus has heretofore been transferred at some other point. If the other point is a freight-transfer station pure and simple without connection with any local freight station, the change to Columbus is a clear gain to the railroad as well, for transferring freight costs money and every pound that is moved absolutely without transfer to and from Columbus costs so much less to handle.

This idea followed to its legitimate conclusion would lead to the statement that freight-transfer stations should be situated not only at the largest centers of population, but that they should be a part of the regular freight stations at such points. The price of real estate will, however, bar the largest cities from this advantage, but the service to and from cities of the second class ought to have the benefit of it. And probably the merchants and shippers of such cities need this help more than those of the largest cities, where competition compels good service.

In order to recoup expenses incurred in meeting such competition the operating department may well refuse to move cars with non-paying loads to intermediate cities of the second class. The combining of a freight transfer with the city station at such points should provide the necessary traffic to warrant first-class service.

Safety and Economy of Working a Switch and a Lock by the Same Lever.

This was the subject of the principal discussion at the meeting of the Railway Signaling Club at Chicago, Sept. 22. Mr. W. H. Elliott presided. Five candidates were admitted to membership. The letter ballot on the question as to whether the club should make recommendations of colored lights for night signaling resulted in a tie and the matter was laid on the table. The chairman was directed to appoint a committee on the subject of primary batteries as applied to signaling, to investigate and report, the report to be based upon experimental investigation. The question of the best material to be used for wooden foundations was introduced by the chairman, and will form the subject of discussion at a future meeting.

The discussion of the paper by Mr. Elliott entitled "Is the Switch and Lock Movement Safe?" (reported in the *Railroad Gazette*, Sept. 25, page 668) was opened by a communication from Mr. J. L. Vernon (N. Y., N. H. & H.). He said:

I do not consider the switch and lock movement as safe as a facing-point lock and I do not think bolt locks attached to signal wires can be made to work properly in all cases. Our switch connections are not as strong as they ought to be. In pipe joints I think the plugs ought to be longer and ought to have two rivets in each end instead of one; and they should have longer sleeves. The ⅞-in. pins used at the connection of every switch ought to have nuts and washers as well as split cotters. In fact, I am now using these pins with nuts and washers on all movable-point frogs and am going to use them at the connections to all switch points.

Mr. H. M. Sperry: The switch and lock movement, when used in connection with an efficient bolt lock, is undoubtedly safe. As to whether it is any better than the facing-point lock is another question. In England, switch and lock movements are used on one line only, the Midland. Mr. Elliott has pointed out very clearly the disadvantages of the switch and lock movement, the short stroke of the plungers and the hard working of the levers. Against this we have a saving in the first cost and possibly a little saving of time in operation. There is no saving if the levers are overweighted.

A saving in first cost is not always true economy. Some plants are costing 50 per cent. more for repairs than they should, on account of the saving that was made in their first cost. Facing-point switches, whether operated with switch and lock movements or by facing-point locks, should be fitted with bolt locks, in order to insure the greatest measure of safety. Stevens & Sons, of England, in 1884, brought out an improved bolt lock, which, in addition to detecting the position of the switch, has a connection to the facing-point lock plunger which detects its position, therefore making it necessary for the switch to be in its proper position and properly locked before any signal can be cleared.

No matter how perfect our apparatus, we are still dependent upon careful inspection and maintenance. In this connection I would like to present a code of rules that I issued in 1886—

1. The plunger should not be withdrawn more than 1 in. from the front rod through which it passes.
2. The full stroke (8 in.) of the plunger must be retained and upon no account reduced.
3. The end of the plunger must be kept square and must not be tapered; the sharp edges may be taken off, but no taper allowed.
4. The top of inside detector bar in its normal position should be 1¾ in. below the top of the rail.
5. The facing-point casting to be fastened to tie with ¾-in. bolts fitted with Verona nut locks.
6. Wrought-iron plates to be used to hold the points of the switches to accurate gage.
7. The pipe from plunger to bell-crank should run parallel with the rail.
8. To test facing-point lock: Have the switch lever pulled over, previously putting a nail or piece of iron ⅛ in. in thickness between the tongue of the switch and main rail; if the plunger of the lock can then be pushed through the hole of the front rod, the latter is incorrectly fitted and must be changed. Test the switch in the two positions. This test should be made with the plunger disconnected, so that it can be pushed in with the hand. When the switch is quite home the plunger should be perfectly free in the front rod; when the switch is ⅛ in. open the plunger should not be able to enter hole in front rod.

Mr. Cox (Hammond & Blue Island): Our Dolton plant is being put in by the Pennsylvania, and this plant will require about 140 levers. We do not have a switch and lock movement in the whole plant. In one of our plants we shall have 223 levers, and no switch and lock movements. At State Line we have one that will take about 153 levers. We have adopted the facing point lock. The oil pockets in the switch and lock movement get stiff in winter, and they are hard to keep clean and to maintain, particularly in winter when there is snow and ice. You will not find that trouble with the facing-point lock.

Mr. Wileman (L. S. & M. S.): I would not have a switch and lock movement if I could help it. I consider them a great deal more expensive to maintain, and in cold weather the slides become covered with frost. I have been making some miscellaneous tests on the pull required to move switches, and a very thoroughly maintained switch and lock movement with a fairly stiff new switch will require sometimes as high as 250 lbs. applied to the end of the slide bar to move it, whereas the lock and detector bar of a facing-point lock seldom require more than 85 lbs. I do not think switch and lock movements should require over 150 lbs.; anything beyond that indicates an overload. Shortening the switch point makes the pull harder and we have been obliged to discard the use of points shorter than 15 ft. On a new derail I have found the pull required to run up as high as 400 lbs. with the joint tightened up; by loosening the bolts, the resistance is greatly reduced. On derails we run up as high as 250 and 300 lbs. (in the open position), but I think about 175 lbs. I found the most desirable. As soon as a switch and lock movement plant begins to deteriorate, it goes to wreck so rapidly and requires so much repairing that in some cases it becomes almost a nuisance, while it is almost impossible, with any sort of care, for a facing-point lock to get into a similar condition.

Mr. RHEA (Pennsylvania): I think that a plant with switch and lock movements will [cost so much for repairs as to] lose the interest on the 25 per cent. you have saved.

THE CHAIR: The experience of the club seems to be against the use of the switch and lock movement, but beyond the matter of repairs, I cannot see that any argument is brought to bear. We have three or four plants where facing-point locks are used almost entirely, but the majority have the switch and lock movement. One of them has two movements from 900 ft. to 1,000 ft. from the tower, and it takes a good pull to throw this one. It has now been in service for five years, and I cannot remember that we have made any repairs on it at all. One point in favor of the switch and lock movement is that while with the facing-point lock it is possible for the operator to unlock the switch after the signal has been put back to danger and let the train go over switch unlocked, this cannot be done with the combination movement.

Following this a topical discussion was held on the subject of the use of selectors, in which the opinion was expressed that they are a source of danger when used for signals on converging routes. A few remarks were made by Messrs. Rhea, Elliott and Salmon on the topic, "Where automatic block signals are used, governing through the limits of the interlocking plants, what are the proper relations between the systems?"

TECHNICAL.

Manufacturing and Business.

Mr. A. O. Norton, 336 Congress street, Boston, is now on the Pacific Coast, where he reports a very good demand for the ball-bearing railroad and bridge jacks made by his firm. Additional machinery has been added to the factory to meet the increasing demands for these jacks. Some quite large orders have recently been received from the Southern States, Mexico, Canada and the Hawaiian Islands.

The Missouri, Kansas & Texas is this week attaching one of the National Electric headlights to a locomotive, with a view to their general use if the results are satisfactory.

Operations were resumed at the Hotchkiss Nut & Bolt Works, Greensburg, Pa., this week, after an idleness of several months. About 100 men are employed.

C. H. McKibbin & Co., on Oct. 24 resigned the General Sales Agency of the Cooke Locomotive & Machine Co., of Paterson, N. J.

Herr B. Schuchardt, senior member of the firm of Schuchardt & Schutte, of Berlin and Vienna, accompanied by Herr Greif, his chief engineer, recently visited the works of Messrs. Gould & Eberhardt at Newark, N. J., and inspected the shops thoroughly. Mr. Schuchardt represents large importers of machinery on the continent, who import especial American products, and is the General Agent for the Gould & Eberhardt Co. Regarding American machinery abroad, Mr. Shuchardt said: "The demand for American machinery is constantly increasing as the large European manufacturers look to this country for the latest and most advanced machinery."

The pressed steel brakeshoe keys which have been made by the Drexel Manufacturing Co. will hereafter be manufactured by the Q & C Company, and be known as the "Q & C."

The Pittsburgh Reduction Co. has completed its new rolling mill at Niagara Falls, N. Y. This mill has a capacity to roll aluminum plates 72 in. in width, and is at present working on orders for plates 60 in. in width.

The Lehigh Valley has just received a steam wrecking car from the Industrial Company, Bay City. It bears shop No. 473. The derrick will lift 30 tons within a radius of 20 ft. Within a radius of 16 ft. it will lift 50 tons.

Iron and Steel.

The Carnegie Steel Co. has recently bought 65 acres of ground in the Borough of Duquesne, from the Oliver estate, for $200,000. This tract of land lies at the lower end of the borough, north of Oliver avenue and on both sides of the railroad. The Carnegie Steel Co. has not made public what it intends to use the new purchase for, but it is said additional finishing mills will be erected, work on the first of them to be begun early next year.

The Cleveland Steel Casting Co., Cleveland, O., has begun work on an open-hearth plant at the west end of its present plant. Excavation has been begun, and it is expected that foundation work will be started soon. The building will be 250 ft. long, with a 70-ft. span. It is the intention to install two 15-ton furnaces to cast small ingots, thus obviating the necessity of blooming down.

The Shoenberger Steel Co., of Pittsburgh, is making considerable additions to its equipment. These additions will include two new steel buildings now being built by Riter & Conley, of Pittsburgh. One of the buildings will be 101 ft. long with a span of 26 ft.; the other building will be 184 ft. long and 54 ft. high with a span of 98 ft. Three 40-ton basic open-hearth furnaces are to be installed.

The Pencoyd Iron Works report large shipments of structural material to the Northern Pacific to be used in repairing and renewing bridges. It is said that 250 carloads have already been shipped.

The steel works of the Hainsworth Steel Co., at Pittsburgh, Pa., recently resumed operations in all departments, giving employment to about 400 men.

The rolling mill of the Lalance & Grosjean Manufacturing Co., at Harrisburg, Pa., started up recently after an idleness of 12 weeks, and will run on full time.

New Stations and Shops.

The Union Traction Company, of Rutherford, N. J., is to erect a new power-house and car barn, the Berlin Iron Bridge Co. having the contract. The buildings will be of brick, with steel framework, the roofs supported on steel trusses. The covering is to be corrugated iron throughout and the roof of the engine-house lined with the Berlin Company's anti-condensation fireproof roof lining.

Messrs. J. J. Walsh & Son, of Baltimore, who have the contract to build the new station for the Baltimore & Ohio at Clarksburg, W. Va., expect to complete the structure in six weeks. About $18,000 will be expended on the station and in building a new freight depot. The passenger station will be of brick, with stone trimmings and slate roof. It is to be 20 ft. × 100 ft. in size. A general waiting-room, ladies' waiting-room, smoking-room, ticket office and baggage and express quarters occupy this space. The location is about a mile above the present depot and is more convenient to the business section of the city. A large freightyard will be constructed adjacent to the new station.

The Bertrand-Thiel Open-Hearth Process.

At the Colorado meeting of the American Institute of Mining Engineers, a paper was read by Mr. Joseph Hartshorne, on the Bertrand-Thiel open-hearth steel process, which has now been in successful operation for more than two years, at the works of the Prager Eisenindustrie-Gesellschaft, at Kladno, in Bohemia. This process was devised jointly by Mr. Ernst Bertrand, General Superintendent, and Mr. Otto Thiel, Steel Superintendent of the Works. The objects were to increase the amount and improve the quality of the product per furnace, and at the same time, to reduce the amount of refractories and additions used; also to obtain a better control of the operations and of the product. Success has been obtained in all of these objects. There are two furnaces, of 12 and 20 tons respectively, the smaller standing at some distance behind and to one side of the larger and at a height of about 10 ft. above it. The furnaces are in the same building with the Bessemer converters. The process consists essentially in dividing the charge between the two furnaces, tapping the metal from the upper into the lower one, and skimming off the slag as it runs through a trough from one to the other. Both furnaces are basic, although this is not an essential feature of the process. Pig iron high in phosphorus and silicon is charged into the upper furnace with a small proportion of scrap, if desired, and also a certain quantity of ore and limestone. The remaindor of the scrap is charged into the lower furnace, together with pig iron and a small quantity of limestone. A little ore is also added, if necessary. The lower furnace is charged about two hours later than the upper, and about three hours after charging the latter the transfer of the contents is made, all of the silicon being then contained in the slag, and the carbon and phosphorus to a certain extent eliminated. The slag is carefully skimmed from the metal as it passes down the trough and prevented from entering the secondary furnace. As soon as the two metals come together a very lively reaction ensues, which quiets down in about a quarter of an hour. The phosphorus is then below 0.03 per cent. in the bath. The heat is finished by the addition of ferro-manganese or spiegel, and the charge is then ready to be tapped, if no further improvement in quality be desired. Fifteen minutes longer in the furnace brings the phosphorus below 0.02 per cent. While the above may be called the standard practice, it may be greatly modified to suit special conditions of present existing plants, and the transfer of metal from one furnace to the other may be done by ladles in case the two furnaces are on the same level.

Steel Industry of Great Britain.

In the statistics of the production of steel in the United Kingdom during the first half of the current year, issued by the British Iron Trade Association, the total output of steel for that time is estimated as 1,969,320 tons, or at the rate of 3,938,640 tons per year. The greatest increase has been in open-hearth steel, of which 2,100,000 tons are now produced per year. During the first half of the year 966,014 tons of open-hearth were produced by the acid process and 97,784 tons by the basic. The acid process also greatly preponderates in the production of Bessemer steel.

A comparison of the total production of open-hearth and Bessemer steel from January to June inclusive, for 1896 and 1895, is as follows:

	1896, tons.	1895, tons.	Increase, tons.
Open hearth	1,063,798	887,800	175,998
Bessemer	905,552	801,880	103,662

These figures show how rapidly the production of open-hearth is supplanting that of Bessemer steel. This increase is still more marked when it is remembered that in 1887 the output of Bessemer was, at least, twice that of open-hearth steel.

The production of Bessemer steel rails during the first half of the present year was 449,924 tons, an increase of 137,610 tons over the 312,314 tons made last year.

The Chicago Elevated Loop.

In the cases brought by the abutting property owners asking for an injunction to restrain the Union Elevated Loop Company from constructing the loop in the downtown district, Chicago, the Supreme Court of Illinois has decided that as the right of way was given by the authority of the people, it was not within the province of an individual property owner to prevent the construction of the loop. If the adjoining property was damaged an ordinary damage suit could be brought in a court of common law. The work on the loop will now be proceeded with as rapidly as possible and will be completed by Jan. 1, 1897.

The New Lehigh Valley Passenger Engines.

In our issue of Oct. 9 appeared engravings and a description of the new wide-firebox engines built by the Baldwin Works for the Lehigh Valley. The errors are entirely due to careless proofreading.

The dimensions of the cylinders are given as 19 in. × 21 in. in one part of the description and as 19 in. × 26 in. in another part. The latter dimensions are correct.

It is stated that the grates are of steel. This should read "plates" (firebox).

The boiler is said to be of "the radial stay with firebox type." It should read "radial-stayed wide firebox."

The diameter of exhaust nozzle is given as 9 in. This should be 8½ in. How this remarkable dimension crept in we are at a loss to discover.

The New York and Brooklyn Bridge.

A board of engineers is to be appointed to consider and decide upon the feasibility of the plan for running the cars of the Brooklyn elevated and street railroad companies over the New York and Brooklyn Bridge to the New York side. This decision was reached at a meeting of the Bridge Trustees this week, the first meeting since July. The Mayors of Brooklyn and New York are each to select an engineer, and the President of the Bridge Trustees a third, who, with Mr. C. C. Martin, the Chief Engineer and Superintendent of the bridge, will form the Board of Engineers. Mr. L. L. Buck has been selected as one member of the board by the President of the Bridge Trustees, but the names of the others have not been announced as we go to press.

The trustees have also finally authorized the construction of a pneumatic mail tube on the bridge, connecting the New York and Brooklyn Post Offices. There will be two-inch tubes, each capable of carrying a cartridge made up of 500 letters every two minutes. The Government is to pay $14,000 a year for the service. The Reno Elevated Incline Co., received permission to build an experimental stairway on the New York side.

Air-Brake Litigation.

The hearing of the case of the Westinghouse Air-Brake Company against the Boyden Brake Company in the Supreme Court of the United States took place on Thursday and Friday of last week. The history of the case, which covers several years, is as follows: The case first came to hearing before Judge Morris in the United States Circuit Court for the District of Maryland. Judge Morris upheld the validity of the Westinghouse quick-action air-brake patent 360,670, and enjoined the Boyden Company under claim 2 of that patent, which he held to be infringed. He decided that claims 1 and 4, which were also in suit, were not infringed. An appeal was taken, and was heard by the Court of Appeals for the Fourth Circuit, sitting at Richmond. This court upheld the decision of Judge Morris as to the non-infringement of claims 1 and 4, and also held that claim 2 of the patent was defective in form and therefore invalid. This decision, therefore, dissolved the injunction granted by Judge Morris under claim 2 of the patent. As the validity of claim 2 of this patent was sustained in another suit by Judge Lacombe, and his decision confirmed by the Court of Appeals for the Second Circuit, the Supreme Court issued a writ of *certiorari*, ordering up the decision of the Court of Appeals for the Fourth Circuit in the Boyden case for review and final determination.

Hopper-Bottom Coal Cars.

The Central Railroad Co. of New Jersey is experimenting with different hopper-bottom devices on coal cars to determine upon a standard for future equipment. A number of cars have just been fitted up with the King, McMahon, Stone & Barney patent hoppers. Records will be kept of the time consumed in unloading these cars in all kinds of weather, together with cost for maintenance, etc.

The "Hawkins Process" in Birmingham.

A correspondent writes: "The Hawkins process of manufacturing basic open-hearth steel, at North Birmingham, Ala., experiments with which have been carried on for some time past, may be classed with those referred to, in Chapter XIV., in Mr. Metcalf's "Book on Steel"—humbug. The result has been the conversion of good, merchantable pig iron into a nondescript product, fit only for the scrap-heap. It is said that at least 20 pounds have been sold as a sample!"

The East River Tunnel Project.

The Railroad Committee of the Brooklyn Board of Aldermen has decided to report favorably on the application of the New York and Brooklyn Tunnel Co. for a franchise to construct a tunnel between the two cities.

THE SCRAP HEAP.

Notes.

Philadelphia papers state that the Union Traction Co., operating nearly all the street-car lines in that city, will, the coming winter, heat all its cars by electricity.

Pacific grain elevators A and B in Chicago, owned by the Chicago & Pacific Elevator Co., adjoining the track of the Chicago, Milwaukee & St. Paul, were burned down on Oct. 26. Loss $1,200,000.

A passenger train of the Chicago & Alton was stopped by robbers near Independence, Mo., on Oct. 23, and the express car robbed, but the messenger succeded in hiding most of his money in a chicken coop which was in the car, and it was not taken.