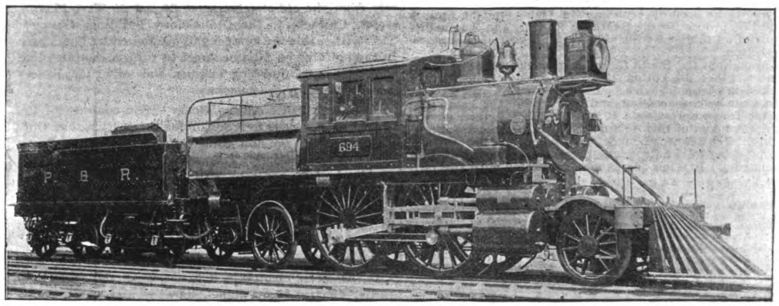
Compound Engines for Heavy, Fast Trains.

The accompanying illustration shows the general appearance of a compound engine built by the Baldwin Locomotive Works for fast passenger service on the Philadelphia & Reading Railroad, and exhibited last year at the World's Fair.

We gave in our issue of April 13 an account of a test made on the Atlantic City line of the Philadephia & Reading



Fast Baldwin Compound Locomotive with Wootten Firebox.

between this engine and single expansion engine No. 1016 to determine which of the two classes was the more economical in high speed passenger service, whether buckwheat or pea coal could be satisfactorily burned in either, and whether either one would show a marked superiority over the other in any respect.

The showing made was decidedly in favor of the compound engine either with egg or pea coal. Neither engine made a satisfactory showing with buckwheat coal and it was found necessary, with engine No. 1016, to use some lump with the pea coal in order to do good work.

Data just received show that engine No. 694 is capable of making excellent time with heavy trains. The schedule of the runs made by this engine on June 16 and 23, 1894, from Camden to Atlantic City, a distance of 55.5 miles, shows that on the first date mentioned the average speed from start to stop was 55.04 miles an hour with a train of ten cars consisting of seven ordinary and three drawing room cars. On the 23d, with a train of seven day coaches and four Pullmans, the average speed was 54.36 miles an hour. The time on the road was materially increased in each case by a delay at the crossing of the West Jersey Railroad, in Camden, the trains having to almost stop; they were running about three miles an hour when the clear signal was given. This crossing is at the foot of an ascending grade of 0.5 per cent. Taken from this point the run of 54 miles was made each day in 55 minutes, or at the rate of 58.9 miles an hour.

On July 7, engine No. 694 hauled this train with three coaches and five Pullmans from Camden to Atlantic City in 57 minutes, or at an average speed of 57.9 miles an hour. The highest test speed recorded was 75 miles an hour and a speed of over 63 miles an hour was maintained for 35 miles. The train was heavily loaded and weighed 366 tons.

On July 14, with the same number of cars and the same load, the run was made in 57 minutes and 30 seconds, an average speed of 57.4 miles an hour. The maximum speed in this case did not exceed 72 miles an hour. As on the run of the 7th, a speed of 63 miles an hour or over was maintained for 35 miles.

Rowell-Potter Automatic Signals on the Chicago & South Side.

It has been mentioned in the columns of the *Railroad Gazette* that the Rowell-Potter Safety Stop Company was placing its safety stop blocking system on the "Alley" railroad of Chicago. All the stations have now been equipped and the apparatus is in working order and giving good satisfaction to the railroad company and the Rowell-Potter Company. In the *Railroad Gazette* of Oct. 6, 1893, was given an illustrated description of the signaling system with which the Intramural road at the World's Fair was equipped by the same company. The Intramural road was blocked throughout its entire length with continuous blocks, and the signals were cleared by an electric current; on the Alley road the entire operation is mechanical. The illustrations given with this are of such principal parts as differ essentially from those illustrated in the article mentioned.

The general arrangement at each station for one track is shown in Fig. 1. The semaphore and safety stop is located 630 ft. back of the "location signal," where engines stop, and about 60 ft. back of these is the operating trip. The operating trip is an incline placed near the rail. This is connected by means of a bell crank to the pipe line which extends to the release trip and the signal trip. When the operating trip is depressed, as when a locomotive runs over it, the release trip is elevated above the rail and the releasing bar is withdrawn from contact with the latch so that the latter may operate when the locomotive passes over the signal trip.

Beyond the operating trip is the semaphore and safety stop; if the semaphore is in the all-clear position the safety stop will be found depressed and the train can pass without stopping; if the signal is at danger, the air brakes are applied by the safety stop. The safety stop and the equipment on the locomotive are the same as those used on the Intramural road. Beyond the semaphore are located the signal trip, shown in detail in Fig. 2, and the latch, shown in Fig. 3. Referring to Fig. 2: The incline of the signal trip is connected with a lever that is at right angles to the track rails; at the outer end of the lever is a heavy weight, when the incline is in the position shown, the weight of the lever acts against the lighter weight of the semaphore and the signal is held in the all clear position. A locomotive passing over the incline depresses it and removes the lever weight from contact with the signal pipe line; this allows the semaphore weight to bring the signal to the danger position. When the incline of the signal trip is depressed, the outer end of the lever throws up the rack shown in Fig. 3, and the dog and latch engage with each other and the rack to hold up the lever weight till the signal is again cleared.

The primary and secondary safety stops and semaphore are so connected by means of the signal pipe line that when the semaphore is at clear the primary is depressed so as not to engage the air-brake apparatus on the locomotive, but the secondary is elevated. Should a locomotive pass over the signal trip and the semaphore not be thrown to the danger position, the secondary safety stop will apply the air-brakes. If the signal operates properly, the primary safety stop is elevated, the secondary is depressed and the train passes without delay. The secondary stop is provided so that if from any cause the signal does not go to danger when a locomotive is passing, the air-brakes will be applied and the engineer thus notified that his train is not protected by the signal. Before the train can proceed the air valve that has been opened by the secondary safety stop must be closed and the brakes released.

When the locomotive has moved 330 feet beyond the station stop it runs over the release trip and depresses it, the operating trip is elevated by means of the pipe line connecting the two, and the latching device is disengaged; the latter operation allows the lever weight to fall, and, overcoming the semaphore weight, it throws the signal to the clear position. By the same operation the signal trip is elevated, the primary safety stop is depressed and the secondary safety stop is elevated.

During the heavy fogs of last winter a locomotive ran into the rear end of a train that was standing at a station, and the Rowell-Potter apparatus has been put in to prevent a repetition of the accident. The operation of the system is entirely mechanical and compels an absolute stop of the train when the signal is at danger or the mechanism is out of order. The signals have not been in operation long enough for any records to be given, but there can be but little doubt that time will prove it satisfactory. With the present train service there are 15,096 operations in twenty-four hours.

Interlocking.

The National Switch & Signal Co. has recently completed the interlocking plant at Colton, Cal., for the Southern California Railroad. This company has also finished the changes in the 80-lever interlocking plant at Forty-third street, Chicago, for the Illinois Central Railroad. These changes provide for the use of track No. 8 by the fast suburban service, and are part of a series of changes now being made by the Illinois Central with a view to increasing the efficiency of the Chicago suburban traffic.

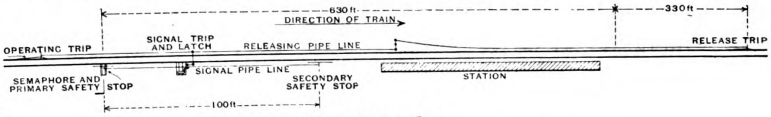
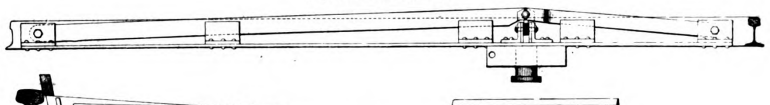


Fig. 1.—General Plan.



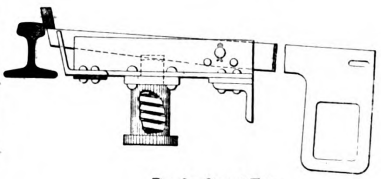


Fig. 2.—Signal Trip.

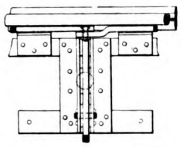
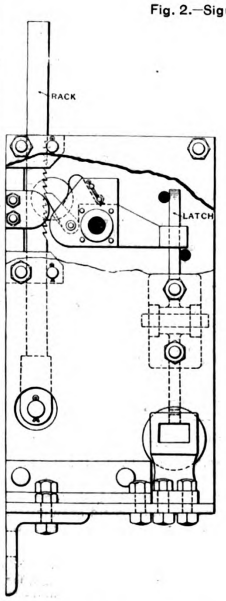


Fig. 2a.—Cross Section of Trip.



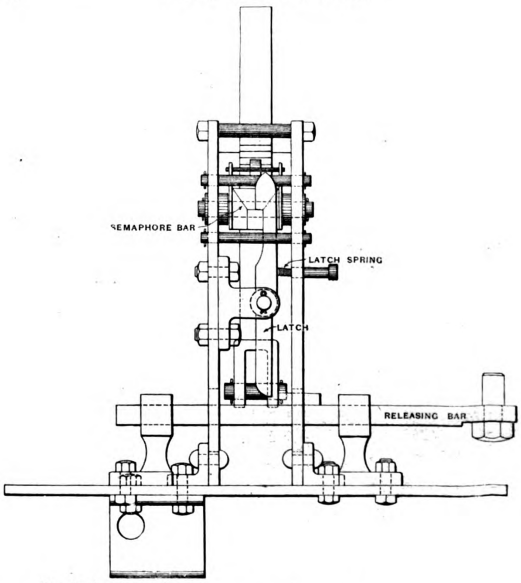


Fig. 3.—Latching Device.

Rowell-Potter Automatic Signals on the Chicago & South Side Rapid Transit Railroad.