

responding increase on the machine side, so that now seventeen engines can be handled at the same time. In connection with these shops has been installed an electric transfer table for shifting engines in and out of shops. This is operated by a 50 horse-power motor, which also serves for hauling the locomotives on and off the table. Also on the machine side of the shop are three drop tables, and there have been added to the equipment a driving-wheel lathe, 90-in. swing, a screw machine, a turret lathe, an engine lathe, 36-in. swing; a 42-in. by 42-in. planer and a boring mill, 51-in. swing.

The flue shop and boiler shop have been joined, and fitted with two flue-welding machines.

The new power-house contains the boilers, and all of the electrical generating apparatus. In the engine room are one stationary horizontal engine; also one 50 kw. power dynamo, two 25 kw. incandescent dynamos, one 10 kw. incandescent dynamo, and two arc machines, 75 lights each. The switchboard is arranged so that when the lights are not required, one or both of the 25 kw. machines can be switched over to the power circuit.

The dynamos are all direct connected, with the exception of the arc-light machines, and are driven by Harrisburg high-speed engines. The pump room contains the boiler-feed apparatus and feed-water heaters; also one Ingersoll-Sargeant independent air compressor, having a capacity of 600 cu. ft. of free air per minute, and the engine used in connection with forced draft for the boilers.

The boiler room contains Babcock & Wilcox water-tube boilers, with a generating capacity of 1,250 h. p. These boilers have forced draft with low stack, and there is space left for an additional 250 h. p. should it be needed later.

The new blacksmith shop is 75 ft. x 200 ft., and contains 32 fires, and is fitted with the Buffalo Forge Company's system of underground blast and exhaust.

The new paint shop is brick, with saw-toothed roof. The building contains 12 tracks, with a capacity of 36 cars. It is heated and ventilated with hot air by the Buffalo Forge Company's system, and is supplied with 33 arc and 144 incandescent lights, the latter so supported by adjustable fixtures as to be moved in any direction.

The passenger car repair shop has a capacity of 14 cars. The freight car repair shop has a capacity of 33 cars.

Fast Run on the Atchison.

We published last week, page 221, an unofficial account of a fast run by a special train over the Atchison, Topeka & Santa Fe on March 27-29, with a profile of that portion of the road over the mountains of New Mexico. After the paper went to press we received the official record of this run, and we print herewith a revised table to correct certain errors. At two places in Kansas the train appears to have travelled over a line shorter than the main line, and therefore the distance, as first published, was wrong. The average rate of speed through, including all stops, was 38.55 miles an hour instead of 39 miles, as first given. Deducting stops, the rate through was 41.71. The engines used on the mountain section were Baldwins with 20 in. x 26 in. cyl-

man in the tower, and the tracks from the westbound yard to the home signal, just east of the tower, are operated as a part of the yard. The calling-on signal was put in to give the man in the tower a quick and convenient means of indicating which one of two or

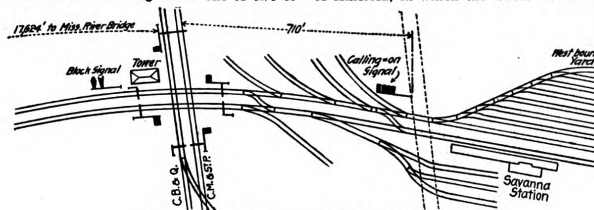


Fig. 1.—Signals at Savanna, Ill.—C. M. & St. P. Ry.

more trains he desires to send forward. The arms are painted yellow (different from the standard signal arm of the road) and when in the horizontal position they show, at night, a yellow light. When the signal is cleared a white light is shown. The upper arm is used to call on passenger trains for the Council Bluffs line; the second arm for Dubuque passenger trains; the third arm for Council Bluffs freights and the fourth arm for Dubuque freights.

The yardmaster's office is at the farther (east) end of the yard. When a conductor at this office is ready to start his train he notifies the towerman by telephone and then proceeds to his train. If the

Would you destroy it? If so, fire away and let the charge pass through my body." The gun was not fired; and the Patent Office was saved. As the nineteenth century, then young, draws to a close, that office is again threatened. The plea then made to a foreign foe prevailed. Will our own people prove less responsive now?

The phenomenal growth of the American patent system, alike a source of pride to us and of admiration to the whole world, has resulted in the accumulation of an appalling mass of important records and documents at the Patent Office which taxes its storage capacity to the utmost and seriously embarrasses its

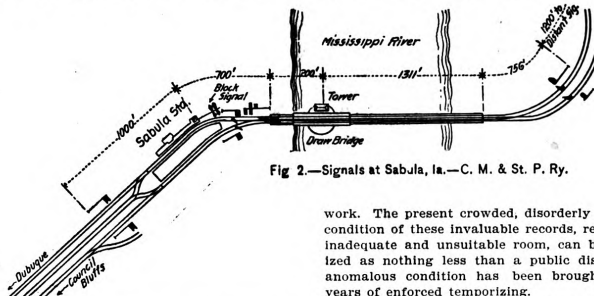


Fig. 2.—Signals at Sabula, Ia.—C. M. & St. P. Ry.

work. The present crowded, disorderly and exposed condition of these invaluable records, resulting from inadequate and unsuitable room, can be characterized as nothing less than a public disgrace. This anomalous condition has been brought about by years of enforced temporizing.

The erection of the present Patent Office building was begun shortly before the fire of December 15, 1836, which destroyed the quarters then occupied by the Patent Office, as well as all its models and records. This building, as finally completed, is in the form of a hollow square inclosing an open court. That portion or "wing" of the building at the south side of this court was first built, it being completed in 1840. About this time the erection of the east wing was begun; but it was not completed until 1852. The funds of the Patent Office, which were kept separate from the general funds of the Government from 1836 to 1868, were drawn upon in the erection of each of these wings, about \$100,000 being appropriated therefrom for the erection of the south wing alone.

The Patent Office was originally nominally under the supervision of the Secretary of State; but upon the creation of the Department of the Interior, in 1849, the Patent Office was made a bureau of that department. The State Department had proven very indulgent toward her sturdy offspring, the Patent Office having been for a long time practically free of all control from that quarter. With the advent of the young stepmother, however, this condition was changed. She at once signified her intention to make her home under the same roof with the Patent Office; and she forthwith appropriated for that purpose the newly built east wing. This wing, having been erected at the solicitation of the Patent Office, and to no small extent with appropriations from its funds, was naturally looked upon as intended for the use of that office; but the young foster mother ruled otherwise. She came; and she brought her family, including the Land Office, the Office of Indian Affairs, and later, the Office of the Commissioner of Railroads. Indeed, she took supervisory charge of the whole building, the west and north wings being meanwhile completed; the former in 1856 and the latter in 1869. Thereafter the Patent Office was destined to have its space boundaries ultimately determined by some official outside its folds, and not infrequently, ignorant, if not indifferent as to its needs, its demands for room being consequently often met, not in accordance with its own requirements, but in conformity to those of some other bureau.

Of course, the household of each member of the family grew. Each accordingly demanded more room. That there were resulting domestic discords, however, is more readily imagined than proven. If they existed, they were kept well within the family circle; and it would now be uncharitable to attempt

SPECIAL TRAIN OVER ATCHISON, TOPEKA & SANTA FE RAILWAY, MARCH 27, 28, 29, 1900.

	Distances, Miles.		Time.		Time Standard.	H. M.	Speed, M. P. H.	Net Speed, M. P. H.
Los Angeles, dep.	0	0	Mar. 27	10:00 a. m.	Pacific	3:55	36.00	37.60
Bartow, arr.	141	141	"	1:55 p. m.	"	4:30	37.55	38.45
Needles, dep.	169	310	"	6:35 "	"	4:07	36.19	
Seligman, arr.	149	459	"	6:13 "	"	5:10	27.67	
Winslow, dep.	0	0	"	11:55 a. m.	Mountain	5:30	43.22	
Albuquerque, arr.	145	888	"	5:50 "	"	6:37	31.64	34.57
La Junta, dep.	286	1235	"	12:37 p. m.	"	11:45	55.85	57.12
Dodge City, arr.	347	1457	"	11:38 "	"	4:30	55.85	55.80
Emporia, dep.	202	1664	"	3:25 a. m.	Central	8:19	35.41	39.51
Argentine, arr.	227	1773	"	8:55 "	"	3:03	45.79	49.98
Chicago, dep.	109	2236	"	11:58 "	"	9:57		
Chicago, arr.	463	2236	"	10:00 "	"			

Time, through, 38 hours. The total time consumed in stops was four hours, 23 minutes.

inders. On the grades west of Winslow, Ariz., Dickson engines, with 19½ in. x 26 in. cylinders, were used. The train consisted of two cars, weighing 145,900 lbs.

Calling-on Signals at Savanna, Ill.

A calling-on signal, which is in use on the Chicago, Milwaukee & St. Paul at Savanna, Ill., was mentioned in a discussion at a recent meeting of the Railway Signaling Club. The engraving printed herewith shows how this signal is used. Savanna is about three miles east of the Mississippi River. Trains are made up here to cross the river and to proceed, after crossing, by either one of two lines, that to Council Bluffs or that to Dubuque. The calling-on signal, which has four arms, is neither an interlocking nor a block signal. The block section westward from the tower (shown in Fig. 1) to the drawbridge, three miles, is controlled by the signal-

signal has led them to form favorable opinions of the color for use in distant signals.

The block section from Savanna westward to Sabula is that on which for several years the Webb & Thompson electric staff was used. The line is now double track, except over the bridge, and the staff apparatus has been taken away and put in service between Rockton and Beloit, on the Racine & Southwestern Division, where there is a complicated train movement.

The Need of a New Building for the United States Patent Office.

By George L. Morton, M. E.,
Principal Examiner, U. S. Patent Office.

While the City of Washington was occupied by the English in 1814, they were about to discharge a cannon trained upon the building in which was located the Patent Office of that day, when William Thorn-