our climate use oil, but must use hard drying colors to give good results. Mr. Keil uses rough stuff on panel work, but does not think it practicable on beaded work. Mr. Bishop uses rough stuff on all classes of work. Mr. McKeon abandoned rough stuff three years ago, and is satisfied the work wears equally well without it. He gives two coats of surface filler, quite thin, then sandpapers it, and he finds the varnish holds out better on this than it does to use rough stuff and rub with pumice stone, as the edges will be cut more or less in rubbing on panel work. He uses a scraping filler over the priming coat, but not on beaded work. Favors discarding rough stuff, both on the ground of economy and that the paint gives better service.

After a lengthy discussion a motion prevailed that it was the sense of the meeting that rough stuff should not be discarded on passenger cars. The matter of inspecting the interchangeable test panels, which had been painted and exposed for 10 months in different climatic sections of the country, was, for want of time to do justice to it, given into the hands of the Secretary, who was directed to examine and make a report after the adjournment.

*Queries.*—The list of queries was fully discussed and valuable information given.

No. 1. Would it be advisable to form a bureau of information in connection with our association? The Committee on Information, consisting of three members, had attended to this duty, but the number was increased to five, and the committee will be known as a bureau of information.

No. 2. Do you use all or part shellac on the hard wood inside finish of passenger cars? It appeared that the majority used shellac for foundation over the filler and finished up with varnish, but Mr. Brown was one who used all shellac with good results. It was brought out during the discussion that there was more durability in shellac than many gave it credit for, but the surface should be oiled over occasionally while in service, which some said was the secret of its durability.

No. 3. How do you prepare your stack blacking for locomotives while in service? Boiled linseed oil and lampblack, made very thin, seemed to be used by many. Put it on when the stack is warm. Some used plumbago and rosin reduced with naphtha, put on with a piece of waste, and claimed it would outwear the stack. Dixon's graphite was used by the President, and he believed it stood more heat than anything else. Mr. Aquart used drop black thinned with turps; apply with a sponge. Mr. Bigelow used boiled oil, lamp black and tallow. Mr. Brown used drop black, raw oil and varnish. Mr. Laing used asphaltum; also Mr. Given. Mr. Moriarty used lampblack and boiled oil. Mr. Mason, raw oil and lamp black; found boiled oil unsatisfactory.

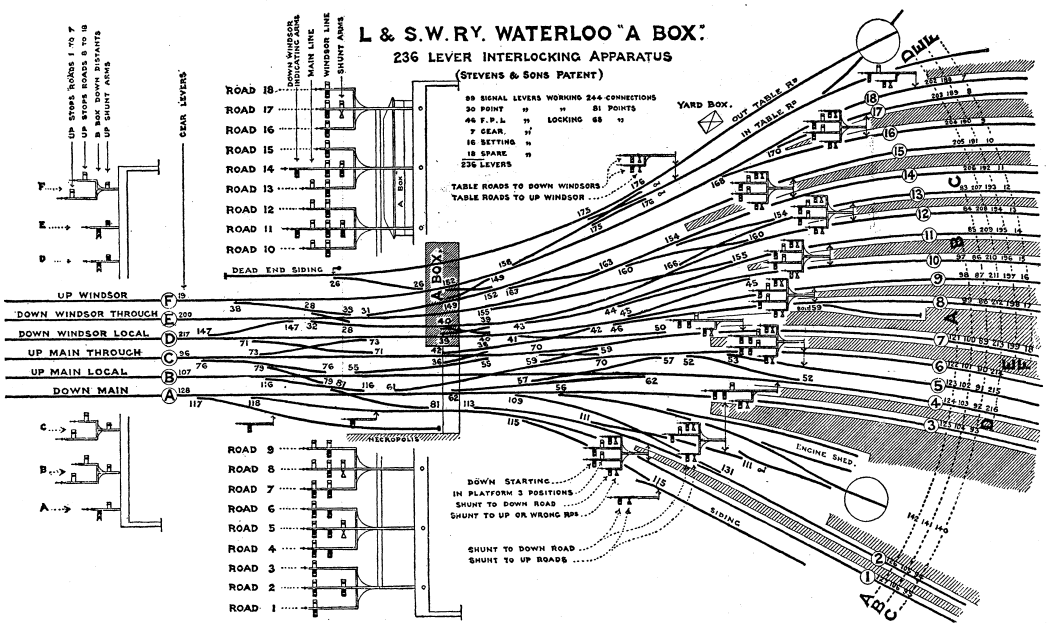
No. 4. What materials do you use and how long do you take to paint your freight cars? A majority of the members were using Prince's metallic paint and boiled oil, and report the time required to paint a car three days, although in good weather it could be done in two days by second coating and stenciling on the second day.

No. 5. How do you keep your paint stock and brushes in the most serviceable state? It appeared that shops had a stockroom with a man in charge who takes care of all stock, giving it out only on the order of the foreman of the man in charge of the gang; each man had checks which represented the different class or sizes of brushes, and when a brush was given out a check was left in its place. Some shops allow the coaters, varnishers and stripers their own tools, with a cupboard to keep them in. It was the sense of the meeting that no matter how small the shop, there should be a stockroom furnished for the proper care of stock and tools.

No. 6. What is the best formula for preparing floor paint for passenger cars? Some did not paint floors, others gave them shellac over the color, which in many shops was a standard paint adopted by the road. Shellac hardens the surface, and will outwear varnish. All kinds look well when run out, but don't last long.

No. 7. What are your views concerning piecework? The general opinion was, it is what all must come to; it was giving the best of satisfaction in all shops where it was tried, and a large number of members were running their shop on that plan. The companies were getting their work done for two-thirds the expense for labor that it cost them under the day and hour system. Some said it would not work in a small shop; others who had adopted it stated they would not change back if they had but two men, and in all cases the workmen were better satisfied and making better wages; so that both employer and employé were greatly benefited by the introduction of piecework.

The convention will next meet in Detroit, Mich., on the second Wednesday in September, 1892.




INTERLOCKING AT WATERLOO STATION—LONDON & SOUTHWESTERN RAILWAY.

## The Slide Railroad at the Columbian World's Fair.

A company has been organized to build a slide railroad, or gliding railroad, or chemin de fer glissant, for the Columbian World's Fair, and contracts are in negotiation for the structure and for the machinery and rolling stock, if it may be called so. The section built will be about one mile long, from Cottage Grove Avenue through the Midway Plaisance to Jackson Park. The structure will be elevated, giving 16 ft. head room in the clear and will carry two tracks. It is proposed to have sufficient capacity to run a five-car train every half minute.

The sliding railroad which was shown at the Paris Exposition of 1889 will be remembered as having been one of the most striking novelties to be seen there. An excellent account of thatinstallation with an historical account of the growth of the idea will be found in *Engineering* Sept. 27, 1889, p. 371. The idea goes back at least 40 years to M. Girard, an hydraulic engineer, but it was first put in practical shape by M. Barre at the Paris Exposition of 1889. M. Barre is the moving spirit in the Chicago enterprise, and having made his preliminary business arrangements here he has returned to Paris to work up the mechanical details. Probably we shall be able later to give an accurate and detailed description of this new installation, but meantime it may be well to describe briefly the system, details of which the reader may have forgotten.

The cars slide on a film of water and are propelled by water jets. The slides on which the cars rest are hollow cast iron boxes. In the middle of each box is a socket to receive a spindle which supports the carriage, which has sufficient play to allow the carriage to pass around curves. For short runs a tender carries water under sufficient pressure to supply the slides. For longer runs there will be reservoirs under the carriages which will be replenished from the power pipe. The working pressure will be 200 lbs. per sq. in. The water is carried from the tender by pipes under the carriages and these pipes have branches which lead to each shoe. The train when in motion is supported entirely on the film of water.

Water under pressure is discharged against a bucket rack fixed under each carriage, and this imparts motion to the train. Each rack hastwo rows of buckets, the angles of the webs of these buckets being set in opposite directions. The water for propulsion is discharged against these buckets by fixed nozzles in the roadway; and ther are two sets of nozzles so as to give a forward or backward motion to the train.

The pumps and hydraulic machinery will probably be furnished by Henry R. Worthington. The capacity of the machinery will be about 800 H. P., with a proper reserve for accidents.

A contract exists for the construction of two miles of similar railroad in London, as an extension of a portion of the Metropolitan Underground. This has been under consideration since 1889 and it is now said positively that work will begin within a very few months.

## Big Day's Work at Waterloo Station.

A London correspondent has sent us, with the accompanying diagram of the yard at the great Waterloo Station of the London & Southwestern, in London, a statement of the number of trains handled at that station on Saturday, July 11, the occasion being the review of volunteers before the German Emperor at Wimbledon. Portions of the "down Windsor" line and one of the up main lines have been put in use since the 1st of April last, materially increasing the capacity of the road, and this is much the heaviest day's movement ever known at Waterloo. And as this is the largest passenger yard now in use, it is probably safe to say that this record shows the heaviest day's work ever known at a single station. The details of the records are as below. The figures are for 24 hours, but the bulk of the traffic was worked in about 15 hours. The down Windsor through line and the up main through line are used chiefly for empty trains and light engines. American readers will bear in mind that "up" means toward the station (toward London); and "down" means from the station; that "road" means track, and that, in accordance with the universal English practice, the semaphore arms are on the left of the posts as seen by engineemen.

*Total number of trains in and out of Waterloo on Saturday, July 11, 1891.*

| | Down Main. | Up Main. | Down Windsor. | Up Windsor. |
|---|---|---|---|---|
| Trains | 111 | 121 | 136 | 123 |
| Engines | 27 | 53 | 32 | 14 |
| Empties | 25 | 53 | 60 | 24 |
| Specials | 27 | 33 | 8 | 12 |
| | 190 | 260 | 236 | 173 |
| Total | | | | 859 |