AN EIGHT-MILE HOUSE MOVING.

In the spring of 1900 it became known that the Chicago, Milwaukee and St. Paul Railroad would build an extension of their road from Yankton, S. D., into Charles Mix County, and the announcement of this produced no little consternation in the three busy little towns of Platte, Edgerton and Castalia, which were situated too far from the projected line to lay claim to all the prospective benefits suggested by that magic term "railroad connection." The railroad surveyors had located on the short branch line two towns which were christened respectively Geddes and Platte, the latter place being the terminus of the road. Immediately after they had been located and surveyed an auction of town lots was announced, to which the residents of the surrounding hamlets flocked. The bidding was keenly competitive, and the very day after the sale the inhabitants of the above-named Platte, Edgerton and Castalia made preparations to move their homes and business buildings bodily to the new town sites. Following closely upon this determination there was witnessed upon those Dakota plains such an exodus as surely the world had never seen before. Buildings of all shapes and sizes could be seen moving across the prairie, some in solitary state, and others in groups of three and four.

The longest journey undertaken by any one building was from the town of Castalia to the new city of Platte, a distance of eight miles, the trip being complicated by the crossing of the Platte Creek and some rather rough intervening country.

The largest building to be moved was the Castalia House, a building forty feet long by 32 feet wide and 18 feet in height. To prepare it for its long journey it was stripped of furniture, the plaster was knocked from the walls, the doors and windows taken out, and the house was trussed by means of planking, diagonally nailed on, and by iron tie-rods. The building was transported on four heavy trucks placed one beneath each corner, the wheels being 2½ feet in diameter with a 2-foot face. Each pair of trucks was coupled together by a 16-inch log which extended longitudinally beneath the sides of the building, and transversely across these logs were placed three 14 by 14 timbers, on which the house rested. The latter timbers extended on each side beyond the house, and a four-horse team was attached at the ends of each timber, there being thus twelve horses on each side of the house. In addition to this, forty horses were hitched, in tandem, to the front end of the building, making thus sixty-four horses in all. At the first pull many of the chains and whiffletrees parted. Stronger whiffletrees were then cut out of stout fence posts, and heavier chains were used, with the result that at the next pull the house started on its journey.

The strange procession was accompanied by a wagon loaded with blocks, chains, jack screws, axle grease and barrels of water. Both the grease and the water were in frequent requisition, as the great friction frequently caused the bearing surfaces to smoke. The chief difficulty experienced in the moving was the crossing of a creek, to accomplish which it was necessary to build two temporary bridges of heavy logs and loose dirt. One of our illustrations shows these two bridges in place and the building descending the slope leading to the creek. Here we see two teams of twenty horses each at the front, with a dozen horses hitched on each side of the building. Owing to the soft nature of the ground difficulty was experienced on either side of the crossing; but as the horses by this time had been trained to pull steadily together, the house was finally taken across and ultimately drawn to the new town site. The last three miles were covered with the assistance of eight more horses, making a total of seventy-two head. For making the pull across the creek, it was necessary to rearrange the teams. The twelve horses on each side of the house were brought up to the front and across the creek, the chains being lengthened and attached to the first transverse log as shown in the third engraving.

As soon as the new site was reached, the building was jacked up, the trucks drawn out, and the structure allowed to settle down on its new foundations. Our correspondent, Cornelius van der Boom, informs us that the new home of this much-traveled house is a thriving little city, where nine months ago was a quiet farm, thirty miles from the nearest railroad.

HOUSE HAULED EIGHT MILES BY A 64-HORSE TEAM.

THE START.

CROSSING THE CREEK.

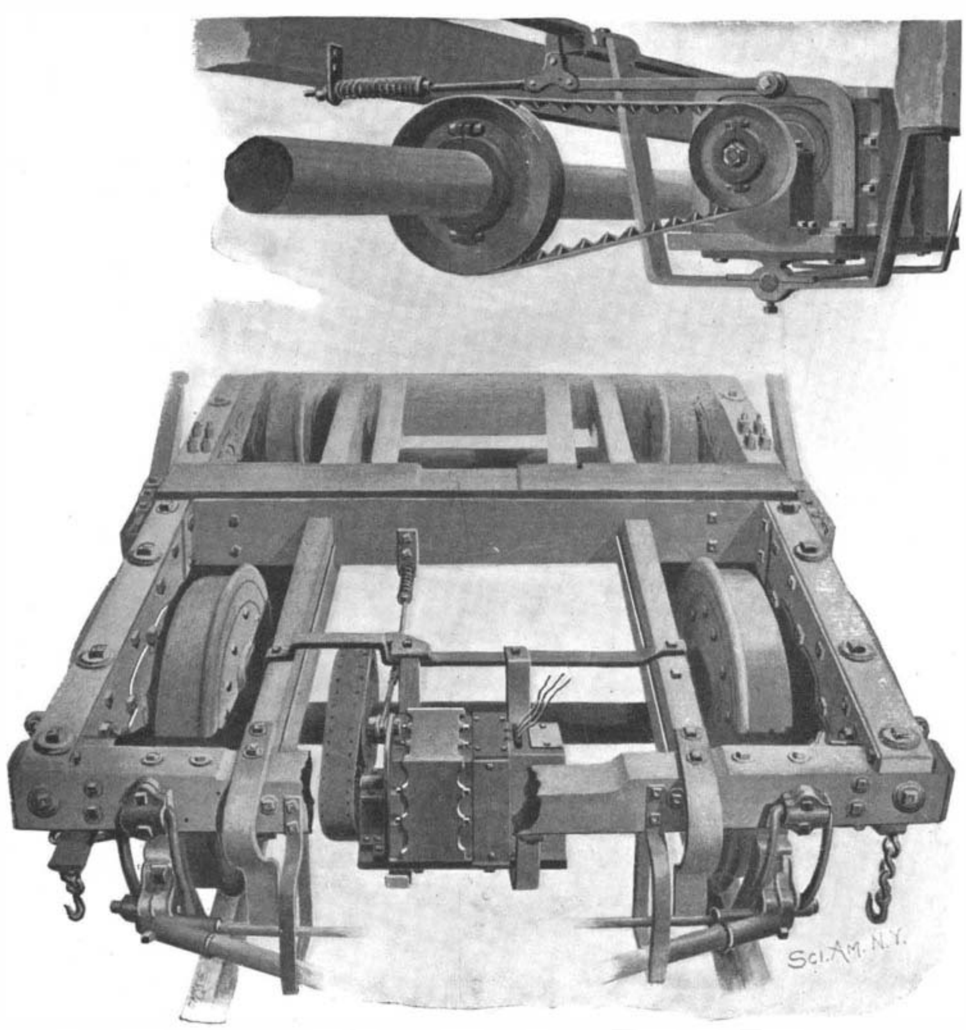
TRAIN LIGHTING FROM THE CAR AXLE.

Tradition has it that the earliest instance of an attempt at car lighting occurred in the year 1825 on the Stockton and Darlington Railway, England. The company boasted of a single coach, whose accommodation consisted of a row of seats along each side and a long table in the center. To one Thomas Dixon, the driver of the "Experiment," as the car was called, belongs the credit of being the pioneer in the important field of car lighting on the rail. On dark winter nights, out of pure goodness of heart, he would buy a penny candle, we are told, light it, and place it among the passengers on the rough board which answered for a table. It is a far cry from the sputtering candle on the "Experiment" to the brilliant illumination of a modern, first-class, vestibuled train; and the history of car lighting would form by no means the least interesting section of a history of the development of railroad transportation.

The candle, no doubt, soon gave way to the oil lamp, whose undisputed possession of the field lasted so long that it is not by any means the oldest among us alone that can remember the extreme discomfort of the old oil lamp—nay, it is possible even to-day, upon certain roads that lead out of New York, to wander into cars which are still lighted with the archaic kerosene lamp. The oil lamp in due course gave way to gas, and this in its turn should, in the natural order of events, give place to some form of electric lighting, the latter having certain manifest advantages in the way of efficiency, comfort, convenience, cleanliness and absence of risk, which are so self-evident as to need no reiteration just here.

Efforts in the direction of electrical car lighting have been confined to two different systems, in one of which current is furnished by a dynamo with a steam drive, located in the baggage car, the other being of the combined dynamo and storage battery type, in which motive power is furnished directly from the axle of the car. The first type is subjected to the manifest disadvantage that the separate cars can be electrically lighted only when the train is coupled up, and in some of the installations made there has been the serious disadvantage of severe vibration due to the steam drive.

The method known as the Consolidated Axle Light system, which has long passed the experimental stage, both in Europe and in this country, is illustrated in the accompanying engravings, which represent the apparatus as applied by the Consolidated Railway Electric Lighting and Equipment Company to the overland trains on the Sante Fe route between Chicago and California. Under this system each car is provided with its own dynamo and storage battery. The dynamo is supported within the framing of the truck, by means of stout U-straps, and it is so hung that the distance between the centers of the driving and driven pulleys respectively on the axle and on the armature of the dynamo can be adjusted. The dynamo is suitably encased in a cast-iron box, which protects it from the dust and fine gravel that are drawn along by the motion of the train. The drive consists of what is known as a flexible gear—a heavy elastic belt with V-



Shows Dynamo Supported in the Truck Frame, and the Flexible-Gear Drive from Axle of Car to Shaft of Armature.

TRAIN LIGHTING FROM THE CAR AXLE.

shaped pieces of leather or rubber riveted upon it at intervals, so as to adapt it for running in the grooved pulleys, as shown in our engravings.

Obviously the most important problem presented by this arrangement is the great variation in the speed of the dynamo, and in the voltage generated. There is also the necessity of lighting the car when it is not in motion. Railway cars run at any speed between ten and sixty miles an hour, and as the armature is driven directly from the axle, the speed of the latter will vary directly as the speed of the train. For reasons which are well understood, the voltage generated increases with the speed of the armature, and hence it is evident that if the constant electric voltage which is necessary at the lamps in electric lighting is to be secured, some kind of regulation of voltage or pressure must be provided. Moreover, as the car may run in either direction, provision has to be made for maintaining the current in a constant direction. Furthermore, as there will be times when the dynamo is not running at all, but when it will be necessary that the lamps shall remain lighted, there is a necessity for storing up the surplus current generated while the dynamo is in motion and yielding it when it is needed. Such an agency is found in the ordinary storage battery. Various means of regulating the voltage have been adopted. One method that has been attempted is to allow the belt to slip as the speed increases; but the impossibility of finding any means of automatically adjusting this slippage has rendered such a device impracticable. Another attempt at regulation is that known as the differential field winding, which is so arranged that as the magnetism due to the shunt winding increases with the speed of the train, the demagnetism caused by the reverse series winding comes into action, the result being a nearly constant pressure.

The Consolidated Railway Electric Lighting and Equipment Company has proceeded on the lines followed by the great electric lighting companies in the matter of regulating the pressure. Constant pressure is maintained by cutting out resistance in the field windings, shunt-wound machines being employed. Thus, if the current increases and the pressure falls, resistance is cut out of the field windings, necessitating a greater flow of current through the field, the effect of which is to increase field magnetism and, therefore, the pressure. On the other hand, if the pressure rises, resistance is cut into the field winding, and the field magnetism and therefore the current pressure is reduced. This system of control is operated automatically by means of a "Regulator" which contains a motor operating in connection with a rheostat and a double pawl and gear movement. The result is an absolute protection against the burning out of lamps or the overcharging of the battery.

In any system of electric lighting from the axle the problem of a proper drive from axle of car to shaft of armature is necessarily a serious one. Attempts have been made to overcome the many and obvious objections to a belt drive by substituting, first, a gear drive, which was found to be unsuitable on account of the extreme vibration set up, and then a friction drive which, because of the vertical motion of the axle, led to heavy pounding of the driving pulley against the driven pulley and an ultimate fracture of the armature shaft. In the gear which forms the subject of the illustration, the difficulty is overcome by combining the positive action of the gears with the flexibility of a belt transmission. The flexible gear consists of a suitably armored belt with V-shaped segments arranged on its inner side, so as to permit the use of a hollow pulley. With this belt, curves of a very short radius may be rounded without the belt slipping off.

Storage batteries are provided for the purposes of storing up the surplus current and yielding it again when the dynamo is running below its whole output, or not running at all. Thus, in the day time, the full output of the dynamo passes into the batteries, and is stored. This current is available when the train is standing on a siding or at a station, or when the speed of the train is so small as not to yield the current needed for the lamps and fans.

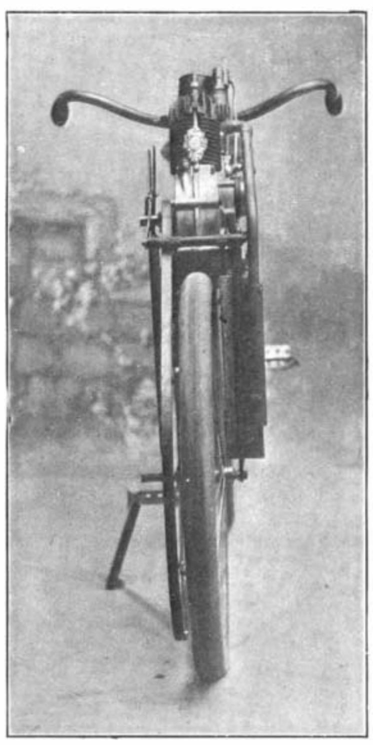
The results obtained with the overland train on the Sante Fe Railroad are stated to have been highly satisfactory, a decided gain being shown, especially when the superior nature of the illumination over that afforded by the ordinary gas system is taken into account. The weight of the installation on each car is less than 2,000 pounds, a very insignificant percentage of the total weight of a modern Pullman coach. Apart from the first cost, the expense attached to this system is exceedingly light, the flexible gear, in spite of the extremely severe duty imposed upon it, giving efficient wear for a period of six months, and the repairs to the electrical equipment, although the dynamo runs at a speed of over 2,000 revolutions a minute, have proved to be very light.

THE LOOMIS GASOLINE RUNABOUT.

RECENT GASOLINE AUTOMOBILES.

The automobiles on view at the Cycle and Automobile Show in Madison Square Garden, of this city, last week, although comparatively few in number, were yet of considerable interest, and in but a few cases were they a repetition of exhibits of the previous shows.

The Loomis Automobile Company, of Westfield, Mass., exhibited two runabouts which are a great improvement over the one shown last year as far as propelling power is concerned. These carriages, which are built with and without a box behind (the box being in this case so much spare space for carrying packages), are equipped with an air cooled Crest duplex nominal five horse power gasoline motor, neatly arranged on the running gear. The running gear is triangular in shape, and is made of a double frame of steel tubing horizontally pivoted to the front axle at the apex of the triangle. The Upton countershaft is used between the motor and the rear axle. This device permits two speeds ahead of five and fifteen miles per hour and one slow reverse. A chain drive is employed throughout. The steering arrangement of this vehicle is a newly patented device. The handle shown beside the seat, in the same position as the throttle of most steam carriages, is moved slightly back and forth to steer in either direction. The lever is pivoted on the under side of the carriage body and attached to a rocker which shifts the steering arm of the wheel by means of a rod connection. The universal ball joint generally used between the steering arm of the wheel and the lever on the carriage is dispensed with, and the arrangement of the handle, besides giving twice the leverage generally to be had, is such that access to the seat is unimpeded.



FRONT VIEW, SHOWING MOTOR, DRIVING BELT AND PULLEY ON FRONT WHEEL.

The Loomis runabout we illustrate was frequently seen running in the basement of the Garden, and it climbed the rather steep incline from the basement to the main floor. It is equipped with mufflers of a new design which effectually deaden the exhaust, and also with a novel carbureter, which we shall illustrate later.

Other gasoline vehicles noted at the show were the "Trimoto" of the American Bicycle Company, the "Warwick," and the "Rambler." We hope to illustrate these in a later issue.

THE ANNUAL BICYCLE SHOW AT MADISON SQUARE GARDEN.

The first impression made upon a visitor to the bicycle exhibition at Madison Square Garden was that the bicycle as such has unquestionably reached its final type. There is less difference between the wheel of 1901 and the wheel of 1900 than between those of any other successive years in the history of the bicycle. But having said this, it must be admitted that there is a marked improvement in the details and finish of many of the machines; and during a tour of the exhibits, we failed to find a single machine that exhibited roughness and clumsiness of design or carelessness in finish.

The chainless bicycle is evidently gaining in favor, if we judge from the proportion of this type that are on exhibition. Both the outside and inside drive are in evidence, the former being the type which was identified so largely with the Columbia bicycle, and the latter with the Spalding wheel. The price has come down, as was predicted, until it approaches that of the ordinary chain-driven machine.

The coaster brake has won its way in popular favor, until now every company is prepared to furnish it, as an extra, with new bicycles. Apart from its convenience in coasting, it has the value of affording an absolutely reliable and extremely powerful emergency brake, as well as one that may be applied with any desired amount of pressure.

Another invention designed for increasing the comfort of riding is the well-known cushion frame, which may be purchased in preference to the rigid frame from most of the leading makers. Perhaps the most noticeable departure of the year, because of its conspicuous position on the machine, is the extension handle bar, which owes its existence to the present tendency to narrow the wheel base of the bicycle. This shortening of the wheel base brings the seat so near to the head of the machine that it is necessary to carry the handle bars on an extension in order to clear the knees of the rider. The change—it can scarcely be called an improvement—was introduced by the riders in paced races, and it is not likely that it will find very much use among the average road riders. Indeed, the roadster machines, in which class is included the vast majority, will still have the old wheel base of 44 inches.

MOTOR-CYCLE WITH MOTOR CARRIED ON FRONT FORKS AND DRIVING FRONT WHEEL.

Several designs of motor bicycles were shown at the exhibition, in most of which the motor is carried within the frame and either belted to a pulley attached to the side of the rear wheel, or fitted with an ordinary sprocket and chain drive. Among these may be mentioned the Thomas Auto-Bi, in which the motor is carried parallel with the bottom bar of the frame, and belt transmission is used, a half-round pulley being attached to the left-hand side of the rear

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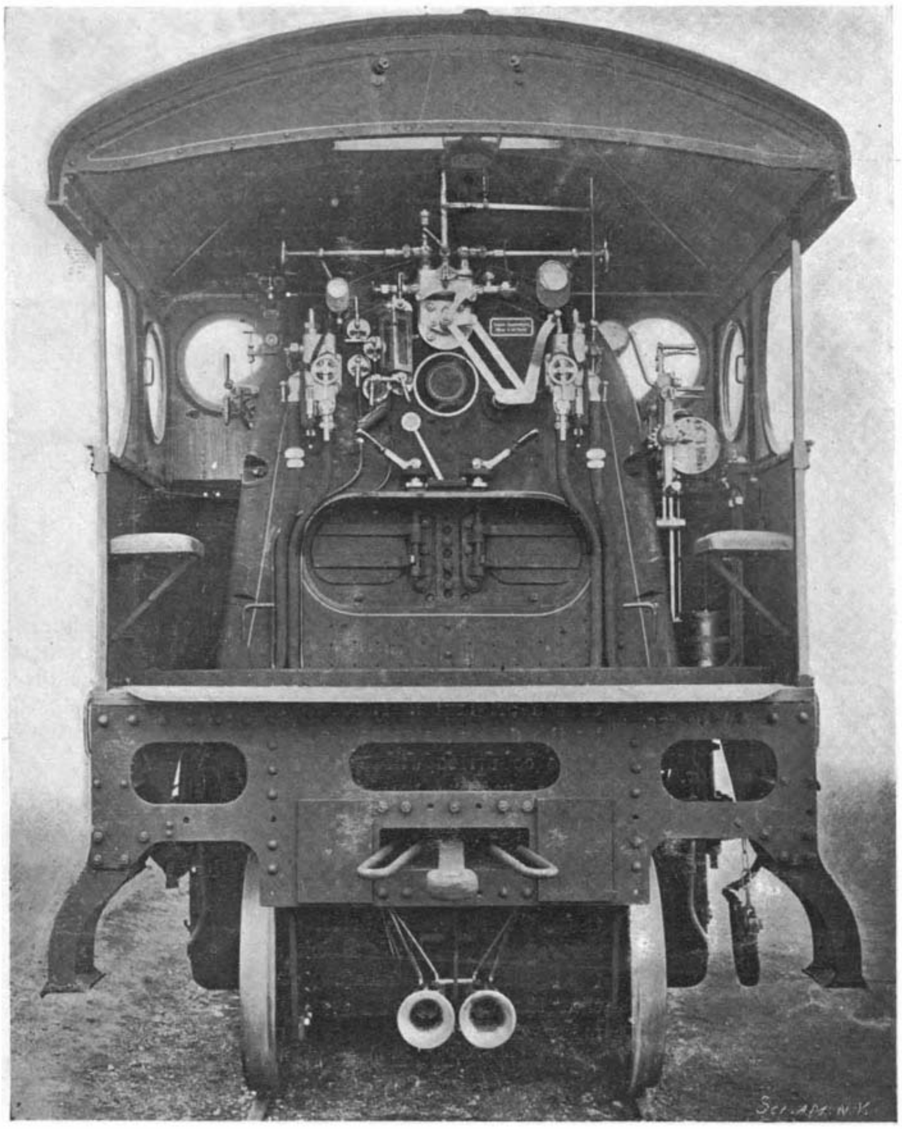
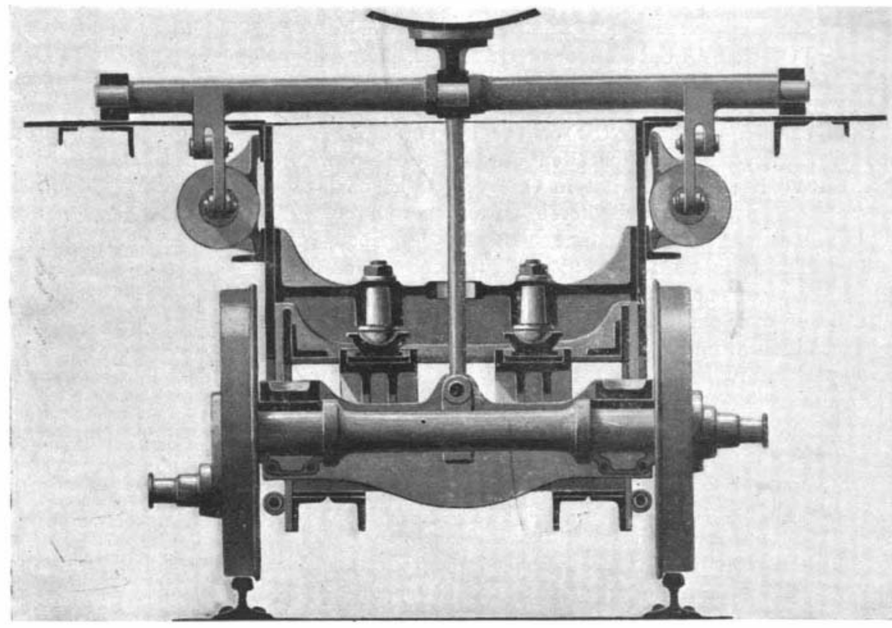
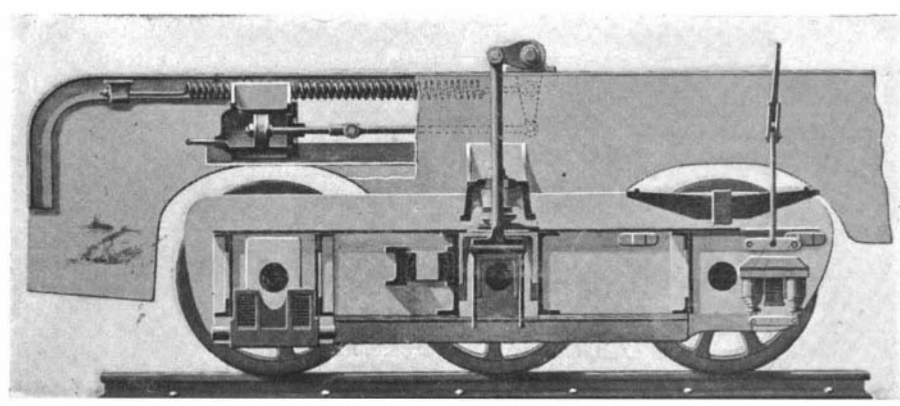


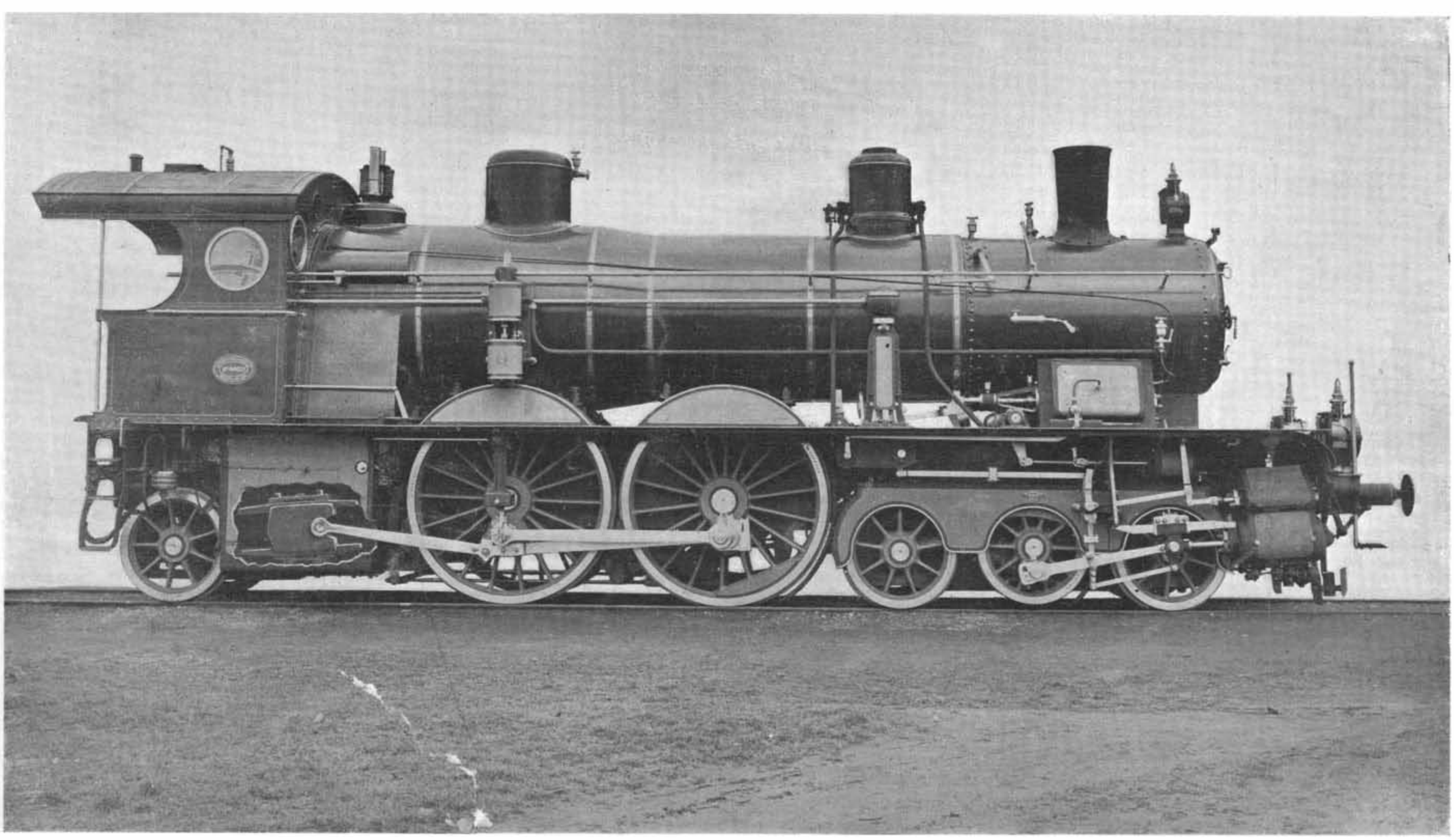
Interior of Cab.



Transverse Section through Auxiliary Driving Truck, showing Method of Adjusting Auxiliary Drivers.



Longitudinal Section through Truck, showing Drivers Depressed.



GERMAN EXPRESS LOCOMOTIVE WITH AUXILIARY DRIVING TRUCK AND RECIPROCATING COUNTERBALANCE.—[See page 55.]