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Improvement in Car Trucks.

The improvement herewith illustrated is the invention of C. R. Morris, master mechanic of the Housatonic Railroad, and H. W. Franklin, superintendent of the same road, and is intended to obviate, so far as can be done by mechanical means, the principal cause of destruction and disaster consequent upon the breaking of a rail during the passage of a train, or the throwing off of the cars from the track by any other cause.

The inventor justly reasons that if the road-bed were perfectly smooth and hard, and lateral motion of a train could be prevented, there could no serious damage result to a train running off the track even at high speed. The sinking of the wheels into the earth, the bumping caused by the opposing ties, and the running down embankments, are the principal causes of the terrible consequences often resulting from accidents of this kind.

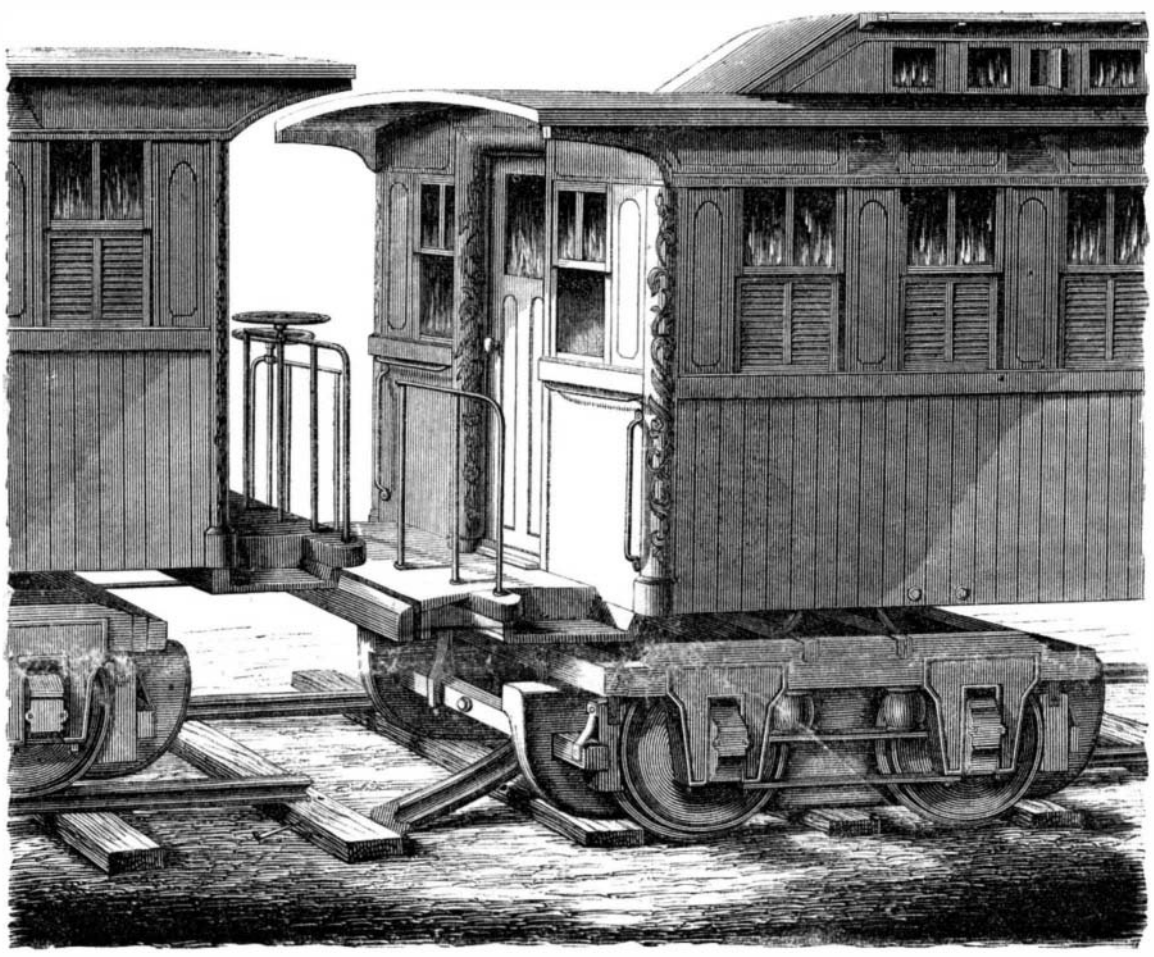
As making the road-bed hard and smooth is of course impracticable, the inventor has attempted to approximate the effect of such a way by attaching to the truck frame two stout runners, made either of heavy plank shod with metal, or entirely of metal, or of any material or combination of materials, which experiment may prove best for the purpose.

These runners are firmly fixed to the truck frame, and descend as nearly as practicable to a level with the face of the car wheels, having clearance, however, for passing over frogs, etc. The brakes act independently of the runners and are in no way connected with them.

It is obvious that, in case of the breaking of a rail in running off the track, these runners will receive at once the weight of the car and prevent all but a slight sinking of the wheels. At the same time they will, in conjunction with the ties, act as brakes to rapidly check the advance of the train, and also prevent lateral motion of the car, as they will more or less indent the ties and thus prevent the cramping of the truck. In case an axle should break while passing over a bridge, the inventors are confident a car would slide entirely across without serious damage, and without any accident to passengers.

An application for a patent on this improvement is now pending through this office.

One of these brakes may be seen in operation at Bridgeport, on the Housatonic Railroad. Address C. R. Morris, M. M., Housatonic Railroad, Bridgeport, Conn.



C. R. MORRIS AND H. W. FRANKLIN'S CAR TRUCK.

STEAM PIPES AND OTHER CAUSES OF FIRES IN MANUFACTURING ESTABLISHMENTS.

Among the most important causes of fires in manufacturing establishments, says the "Bulletin of the National Association of Wool Manufacturers," for July, is danger from steam pipes; the danger being greater because the steam or hot-water pipes being introduced as a measure of precaution against fires, liability from fire is not apprehended from that source. Steam and hot-water pipes are often suffered to remain in contact with wood-work, and frequently packed with charcoal or sawdust to prevent radiation. The following facts illustrate the danger of these practices :

The officers of the insurance companies charged with the examination of mills, remark upon the general prevalence of the impression that there is no danger of ignition from steam pipes. An insurance officer, visiting mills at Exeter, N. H., observed a steam pipe running through a partition, and in contact with the wood-work. The agent, although incredulous of danger, promised to cut out the wood around the pipes. A few days afterwards the wood was removed wherever in contact. In the course of the examination, timbers in contact with the pipe, at a distance of three hundred feet from the boiler, were found to have been on fire. The pieces which were shown to me were completely charred. My informant stated the following case to the agent, who incredulously inquired, "Did you ever know a case where steam pipes set wood on fire?"

"At the Oneco Mills, in Sterling, Conn., there being no steam-heating apparatus, a detached tubular boiler was placed in a building at some distance from the mill, to supply steam for heating and for running a donkey engine to assist the water wheel. A steam pipe two and a half inches in diameter, for conveying the steam to the mill, passed through the wall of the boiler house, then ran perpendicularly to the ground, and under ground into the mill. To prevent condensation of the steam, the pipe was inclosed in a tight box of wood filled with powdered charcoal. All worked well for ten days, when a fire took place in the horizontal inclosing box, near the boiler house—supposed to be from a spark from the boiler—then in the perpendicular portion of the inclosing box, and finally in the part under ground." The facts before stated as to the ignition of charcoal, show that spontaneous ignition was the almost inevitable result of this contact of charcoal with hot-air pipes. Where it is desired to prevent radiation from steam pipes and boilers, it would be well to adopt the plan recommended by Prof. Tyndall in his lectures on "Heat as a Mode of Motion," who observes that "there are cases where sawdust, chaff, or charcoal could not be used with safety (to prevent radiation from steam pipes), on account of their combustible nature. In such cases powdered gypsum may be used with advantage. In the solid crystalline state it is incomparably a worse conductor than silica, and it may be safely inferred that in the powdered state its imperviousness far transcends that of sand, each grain of which is a good conductor. A jacket of gypsum powder around a steam boiler would materially lessen its loss of heat."

Mr. Braidwood, whose vast experience gives great weight to his opinions, earnestly warns against the danger from steam and hot-water pipes. He says: "There appears to be some chemical action between heated iron and timber, by which heat is generated at a much lower temperature than is necessary to ignite timber under ordinary circumstances. No satisfactory explanation of this fact has yet been given, but there is abundant proof that such is the case. In heating by hot-water pipes, those hermetically sealed are by far the most dangerous, as the strength of the pipes to resist the pressure is the only limit of the heat to which the water, and of course the pipes, may be raised. In some cases a plug of metal which fuses at 400°, is put into the pipes, but the heat to which the plug is exposed will depend very much on where it is placed, as however great may be the heat of the exit pipe, the return pipe is comparatively cool. But even where the pipes are left open the heat of the water at the furnace is not necessarily at 212°. It is almost needless to say that 212° is the heat of boiling water under the pressure of one atmosphere only; but if the pipes are carried sixty or seventy feet high, the water in the furnace may be under the pressure of nearer three atmospheres, and therefore the heat will be proportionably increased. Fires from pipes for heating by hot water have been known to take place within twenty-four hours after first heating, and some after ten years of apparent safety."

Mr. Braidwood, in his testimony before a committee of the House of Lords, in 1846, stated that it was his belief that by long exposure to heat, not much exceeding that of boiling water, 212°, timber is brought into such a condition that it will fire without the application of a light. The time during which this process of desiccation goes on, is, he thinks, from eight to ten years. The writer in the *London Quarterly*, before quoted, says that Mercers' Hall, in London, built in 1853, was the victim of its hot-water pipes; the wood-work in the vaulted rooms of the British Museum, containing the Nineveh marbles, was fired in a similar manner, and the new Houses of Parliament have been on fire several times already from a similar cause.

The most cautious insurance companies, taking in view the absolute danger from steam pipes, unless most carefully fitted, and the common belief that there is no danger, which prevents the requisite care, regard the system of heating by steam pipes as ordinarily no safer than heating by anthracite stoves, or by burning wood in a box stove well fitted up—as the visible presence of the fire induces carefulness. Still the system of heating by steam is preferred when the pipes are well fitted, and all contact with combustible matter prevented. It is better that the boiler should be outside in a building erected for the purpose. When the pipes pass through a floor they should be surrounded with an iron plate or flange. The inner rim of the flange should be provided with points touching the pipes, so that a constant current of air should pass through.

The danger in heating by horizontal smoke flues, although they are rarely used in mills except for drying purposes, is greater than in the use of steam pipes. As the whole of the draft must pass through the fire, these flues, if not properly built, are dangerous through their whole course. This is observed in the market green-houses which formerly were generally heated by such flues. The author of "Practical Floriculture and Gardening for Profit," Mr. Peter Henderson, says: "Too great caution cannot be used in keeping wood-work away from the flue and chimney at the furnace end; and for fifteen feet of the hot end of the flue, wood should never be placed nearer than one foot. Do not listen to what your builders may say, as few of them have had experience in such matters; and whatever they may pretend, not one in a dozen knows more about what is dangerous from a fire than you do yourself." After mentioning several instances to show the necessity of the utmost caution in the use of this mode of heating, he remarks that, "Every winter there are hundreds of fires originating in green-houses by the wood-work taking fire from flues."

Although gas, if carefully laid on and properly used, is safer than any other light, it is important that much care should be exercised in the location of the jets. Gas-burners are dangerous when placed near a ceiling. Mr. Braidwood mentions an instance where a gas-light set fire to a ceiling twenty-eight inches and a half from it. The papers, as I am informed, have recently published a statement of a similar instance which occurred at Pittsfield, Mass. Mr. Eyre M. Shaw, superintendent of the London fire department, in 1862, and the successor of Mr. Braidwood, lays down the rule that "jets or movable gas brackets should never be less than thirty-six inches from the ceiling over it. They should be protected on top by hanging shades, and on the sides by stops on the several joints, which should prevent brackets from moving more than a safe distance." "Attention," he says, "should be called to the very common and dangerous practice of nailing tin or iron on adjoining timbers. This has long proved to be no protection, and it has the disadvantage of allowing the timber to be charred completely through before it is known." Fires often proceed from carelessness in lighting gas. Mr. Braid-