

**AN IMPROVED AUTOMATIC CAR BRAKE.**

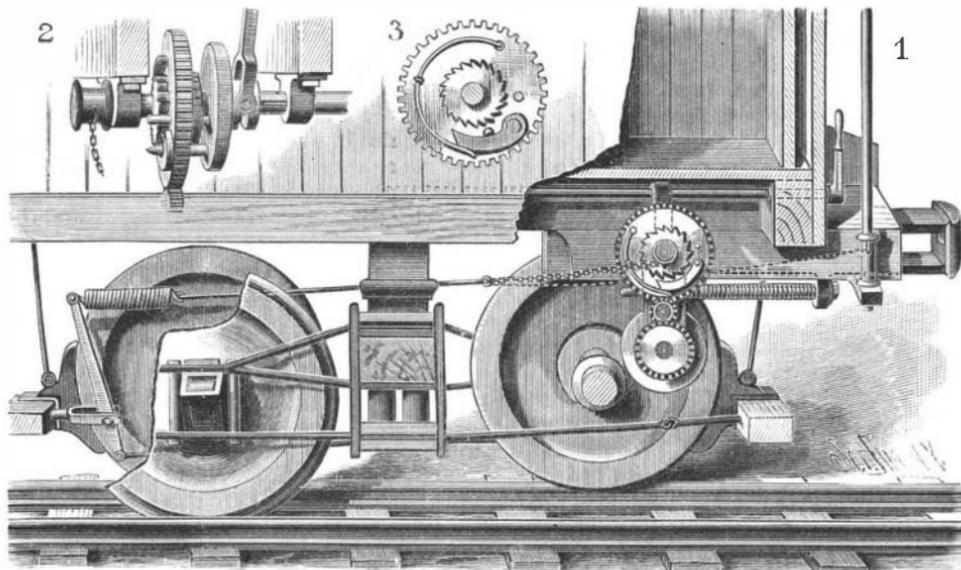
A novel construction of car brake, intended specially for use on freight cars, is shown in the accompanying illustration, and has been patented by Mr. Orson P. Smith, of Buford, Macoupin County, Ill. Attached to the under side of the drawbar is a rod on which is a coiled spring pressing at its rear end against a frame pivotally suspended from the bottom of the car. In the lower end of this frame is journaled a shaft carrying a friction pulley adapted to engage a friction pinion on one of the car axles. On this shaft is also a

When the car is coupled at its other end to the preceding car, the train of gearing connected with the friction wheel upon the axle winds the brake chain upon its pulley in the reverse direction, the lever handle extending up from opposite ends of the car being moved so as to bring the pawl and ratchet wheel on the opposite face of the large gear wheel into engagement. When the train is backed up, the friction wheels rotate the train of gear wheels, but the respective pawls do not engage the ratchet wheels, and the shaft on which is the brake chain pulley is not rotated by the large

gear wheel and its connections. The brake rod is also connected in the usual manner with the hand brake of any ordinary form of construction, as shown in our illustration.

**The Malabar.**

The Indian troop ship Malabar has made a six hours' full power trial at Portsmouth of the new set of engines with which she has been fitted by Earle's Shipbuilding Company, at Hull. The engines are of the triple



SMITH'S AUTOMATIC CAR BRAKE.

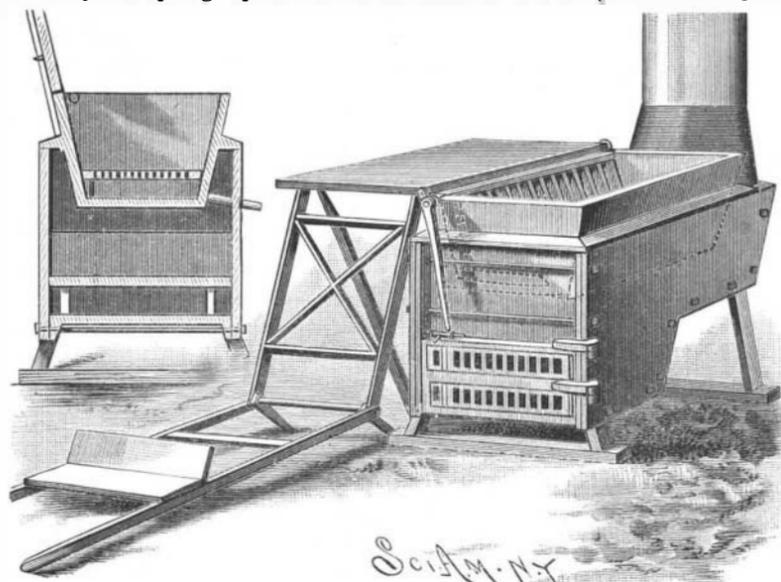
gear wheel, which communicates its motion, through a small pinion, to a larger gear wheel above, the latter being fixed on a shaft that is axial with the fulcrum of the suspended frame, so that a swinging motion of the latter does not disconnect the gears. On this upper shaft is also a pulley, on which winds one end of the brake chain, which is made fast at its other end to the brake rod, operating the usual brake mechanism in the ordinary way.

This brake-operating mechanism is only on one end of the car, and when the latter is moving forward with a pull upon the drawhead, the friction pulley in the suspended frame does not act upon the car axle. When the engineer desires to brake the car automatically, he lessens the speed of the locomotive, and the drawheads, coming together, are pushed inward, whereby the spring upon the rod attached to the un-

expansion kind, and are the largest of the type which have been received in her Majesty's service, and, with one or two exceptions, the largest which have been yet manufactured in this country. In addition to the new engines, the hull has been subjected to a complete overhaul and repaired outside and inside, new fresh water condensers and fire engines of superior size and power being also supplied. The maximum power indicated at the trial was 4,505 horse, but the mean of the entire trial was 4,231, being below the contract. The speed realized was particularly good, reaching close upon 15½ knots, while the consumption of fuel per horse power per hour was as low as 1.67 lb.

**A COMBINED FEED COOKER AND SCALDER.**

The invention herewith illustrated, which forms the subject of a patent recently issued to Mr. William A. Steffa, of Rockvale, Oregon P. O., Ill., furnishes a novel construction of feed cooker and hog scalding, which can be readily used for either purpose. The furnace portion is commodious, and calculated to burn advantageously almost any kind of fuel, the furnace door having dampers both above and below the grate, the latter being readily removable if desired. Within the furnace is suspended a tank with flaring sides and ends, so that spaces will be left between the sides and ends of the tank and those of the furnace, and the products of combustion will pass all around the tank. The cover of the tank is hinged to lugs, in such way that it can be turned back and supported in horizontal position at one side to serve as a table; and connected with the forward end of the cover is a hinged frame, which carries a shelf or chair, of sufficient size to



STEFFA'S FEED COOKER AND SCALDER.

der side of the drawbar presses the suspended frame inward, and the friction wheel which it carries is brought into frictional contact with the pinion on the car axle, the shaft in the suspended frame thus operating the one above it, on a pulley upon which the brake chain is wound and the brake shoes thereby applied.

Upon each face of the larger gear wheel of the upper shaft, as shown more clearly in Figs. 2 and 3, is secured a ratchet wheel, the teeth of which stand in opposite directions on the two faces, and a spring-controlled pawl engaging the ratchet wheel on either side. The reversing mechanism, consisting of a disk adapted to slide sidewise on the same shaft, operates these pawls, the disk having projecting pins which pass through apertures in the web of the large gear wheel, and each having a bevel which operates on the pawls, in such a manner that while one pawl is held in contact with its ratchet wheel the other is disengaged from the other ratchet wheel. The disk can be moved sidewise by a shifting device, consisting of an arm with a lever handle extending upward at the ends of the car, the arm being secured to a shaft held in suitable bearings on the under side of the car, and extending its entire length.

receive a hog, so that when the frame is raised the hog will slide or can be readily drawn upon the open cover of the tank at its side. Close to the hinged edges of the cover, and within the tank, is journaled a shaft upon which are formed arms, that rest against the side and bottom of the tank when turned down, but which serve as a cradle for lowering the hog into and raising it from the tank, this cradle being operated by a crank arm or lever at the front. When feed is to be steamed, a perforated false bottom, as shown in the small view, is placed in the lower part of the tank, and the liquid or semi-fluid contents of the tank may be drawn off through a discharge opening in the lower part of one side.

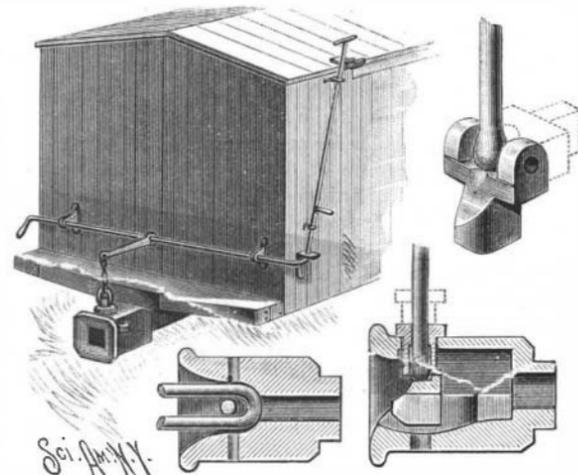
**Puddled Aluminum Iron.**

Recently we had occasion to refer to some successful experiments in the manufacture of cast steel, free from blow holes. The results were due to the admixture to the steel of 0.1 per cent of aluminum. During the week just closed, experiments were made with puddled iron in charges of 500 lb. The results were by no means conclusive, but enough was shown to illustrate the advantages of combining aluminum with iron.

Strangely enough, the charges containing the low percentages of alloy turned out the strongest material. So, for instance, the addition of 0.1 per cent of aluminum raised the tensile strength from 52,000 lb. to 60,000 lb., an increase of 16 per cent, while the elongation was variously increased up to 21 per cent. One of the tests conformed to the method of testing marine steel, the elongation of the one inch test spot being 0.1875 per cent, or 3-16 of an inch. What may be done with puddled iron is shown by experiments conducted by Mr. Graham W. Thompson, a leading iron manufacturer of Glasgow. The tensile strength of ordinary puddled iron, 22 long tons with 12 per cent elongation, was by the addition of 0.25 per cent of aluminum increased to 31 long tons with 23 per cent elongation. When mixed in equal parts with ordinary stock, this treated material still showed a tensile strength of 28 English tons, with 8.23 per cent elongation, and a third mixture of the already reduced stock with common stock resulted in a tensile strength of 25 tons, with 7 per cent elongation. The experiments with puddled iron will be pursued in other ways until some fixed rule of procedure may be established.—*Cleveland Iron Trade Review.*

**AN IMPROVED CAR COUPLING.**

The accompanying illustration represents the principal features of a car coupling which has been patented by Mr. Bush F. Laird, of Ocean Springs, Miss. One of the small figures gives a longitudinal sectional view, and another is a plan in section of the bottom of the drawhead with the coupler entered, while a third figure shows the action of the pin support, the dotted lines indicating its backward swing as the entering coupler pushes against its front side. This pin support is held in its pivoted position by bolts entering



LAIRD'S CAR COUPLING.

from either side of the drawhead, and the pin is movable vertically in a sleeve with a shoulder which engages a top plate. The horizontal shaft across the car just above the drawhead, with its arm and chain, and its connections at each side and at the top of the car, indicate the means of coupling and uncoupling to obviate the necessity of the operator going between the cars.

**Colors from Coal Tar.**

Prof. Watson Smith, of Owens College, Manchester, England, in speaking of colors obtained from coal tar, recently said:

"Formerly they used to rely principally upon vegetable dyes of animal origin. The vegetable or wood dyes, however, had to a large extent disappeared, and there were not many of these with which they needed to trouble their minds, because they had been replaced, and would be still further replaced, by other materials. There were really only two of these vegetable dyes remaining—indigo and logwood—all other wood dyes having been already more or less replaced by coal tar dyes. Lac dye had been entirely displaced, and the consumption of cochineal had been reduced to probably less than 200 tons per year. A great deal has been said against coal tar dyes. They were told that these dyes were fugitive and poisonous, and that there could not be produced from them as fine a shade as was obtained from the vegetable dyes. Now, all this was fallacious. If all that had been said against coal tar colors was true, one would naturally be led to suppose that the consumption of them would decrease. But what was the fact? Why, in the last year the consumption of these coal tar colors had increased more than thirty-three per cent. Trade last year was bad all over the world—they hoped that this year it might be better—yet this increase of consumption had taken place, quite exclusively, he should say, in compound colors. No fabrics were now dyed in any of the pure colors, and the increase of consumption had taken place in judiciously blending these colors with themselves or with vegetable dyes. A card of 'spring shades, 1887,' being 150 different colors obtained from coal tar, without indigo or any vegetable dyes, was shown. These colors comprise many bright and most delicate shades."—*Progressive Age.*