

Boiler Iron Shovels.

A Shanghai paper states that a novel branch of industry has recently sprung up at Chefoo. It is the manufacture of iron shovels. They are made from old boiler tubes. Hundreds of men and boys are now engaged in this business. The old tubes are cut into short cylinders, just the length of the shovel, and then ripped open, flattened out, and hammered into shape. Piles of these old boiler tubes may be seen everywhere in the back courts of the native Hongs. Mule loads of these shovels are to be seen every day going into the country, and I learn that for one or two hundred miles in the country there is now scarcely a farmer that has not an iron shovel. The prices vary from 25 to 40 cents apiece according to quality, thus bringing this useful instrument within reach of all.

POWERFUL AUTOMATIC CAR COUPLER.

The drawhead is secured to the car in any suitable manner, and, is formed of the front and rear walls, B B', properly bolted together. Sliding laterally between these walls are the jaws, C C', which have noses at their inner ends and are pressed toward each other by springs, D, encircling guide rods which pass through openings in the sides of the drawhead. The guide rods are operated by chains leading to levers mounted on the cars, so that the jaws can be moved in opposite directions, thereby separating them for uncoupling. This construction is designed particularly for freight cars, because the jaws are not locked when coupled, and a slack is obtained between the cars.

For heavy passenger and parlor coaches, the jaws are formed with lugs, L, projecting through slots in the rear walls of the drawhead; attached to the lugs are chains, F, or preferably rods, operated by levers from above, which lock the jaws when the cars are coupled and withdraw the jaws for uncoupling. When the cars approach each other, the pointed, conical, or spear shaped coupling bar, J, enters the drawhead between the jaws, forcing them apart. When the shoulder of the head has cleared the back of the jaws, the springs force the noses of the jaws toward each other, causing them to take firm hold of the head of the coupling bar. In order to adapt the coupling bar for use with old style couplers, it has a hole at each end to receive the pin and a slot to receive the link. At about the center of the bar is a shoulder, M, made long enough to span the drawhead opening, so that when the cars approach each other it will control the extent of the entrance of the bar into the head.

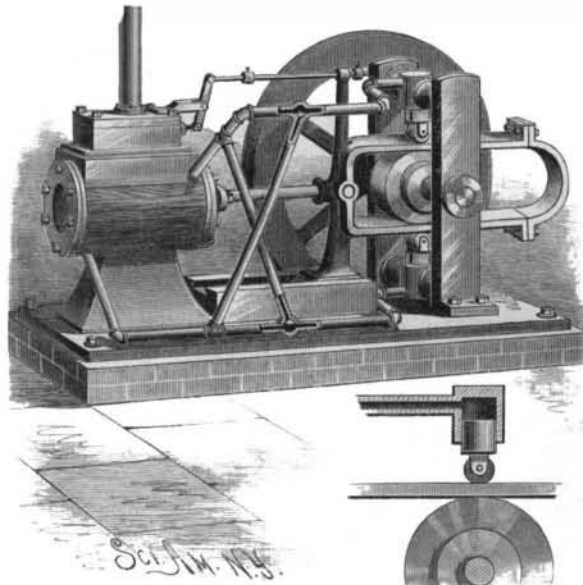
The inventor of this coupling claims that the coupling bar is equal in strength to the drawhead, thereby doing away with the weak link between the cars, and preventing them from separating in case of derailment. The shoulder, M, also acts as a safeguard by controlling the lateral movement of the cars. It is further claimed that the cars cannot mount, overturn, or separate from each other, and that there is uniform strength throughout the train to resist the shock of collision. This coupler can be adapted for use with varying heights of drawheads, and dispenses with all lever links and pins.

The inventor of this coupling, Mr. D. B. Gray, whose address is Germantown, Philadelphia, Pa., will furnish all further particulars; or Mr. John A. Wiedersheim, attorney, Record Building, Philadelphia, Pa.

THE greatest length of Lake Superior is 335 miles; its greatest breadth is 160 miles; mean depth, 688 feet; elevation, 627 feet; area, 82,000 square miles.

A NOVEL STEAM ENGINE.

This steam engine is so designed that the reciprocating motion of the piston is converted into rotary motion without the use of a crank or of racks and pinions. It also obtains a uniform leverage throughout the entire stroke, thereby avoiding loss of power



WEBB'S NOVEL STEAM ENGINE.

due to use of the crank. A yoke carried by the piston rod is so arranged as to alternately engage opposite sides of a friction wheel mounted on the main shaft. On each side, above and below this wheel, is a small cylinder whose piston rod carries at its outer end a friction roller. These pistons are actuated by steam led from the main cylinder through suitably arranged pipes so as to alternately press the upper and lower rollers against the side bars of the yoke, which pass between the rollers and friction wheel. Steam admitted to the forward end of the main cylinder not only acts upon the piston to force it back, but simultaneously acts upon the small upper piston, whose roller is forced against the upper yoke bar, which is pressed into frictional contact with the upper surface of the wheel, which is caused to rotate. The greater the steam pressure in the main cylinder, the greater will be the pressure upon the bar. When the main piston has completed its rearward stroke, a

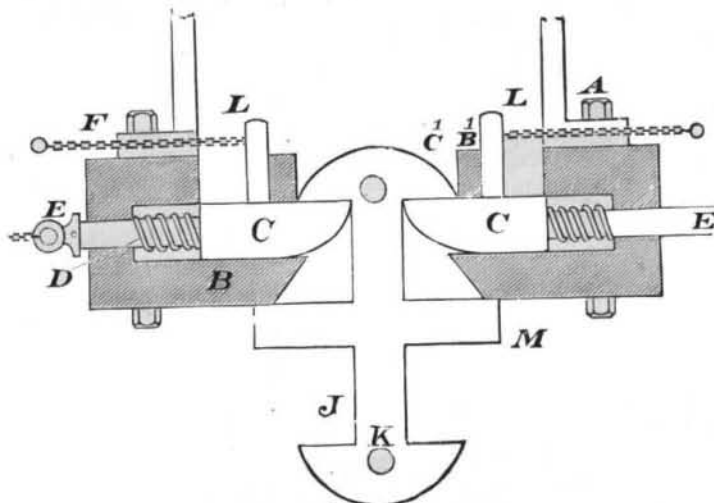


Fig. 2.—PLAN VIEW—AUTOMATIC COUPLING.

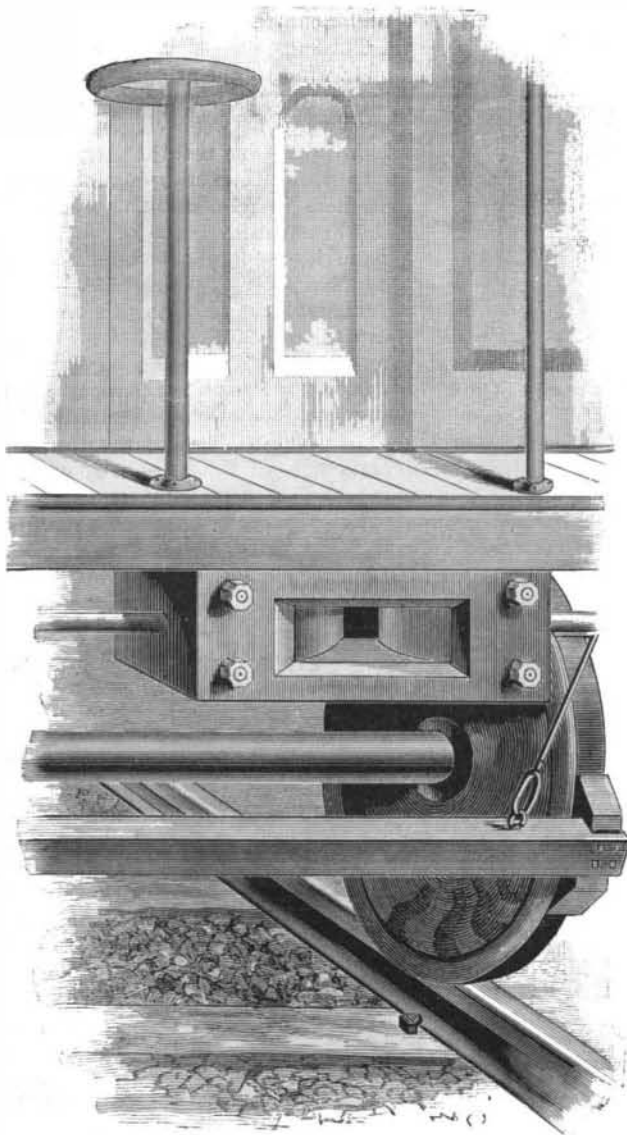


Fig. 1.—GRAY'S AUTOMATIC COUPLING ATTACHED TO PASSENGER CAR.

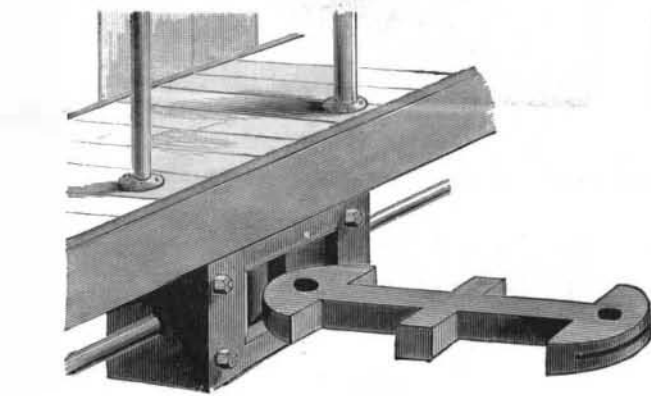


Fig. 3.—COUPLING BAR IN POSITION TO ENTER DRAWHEAD.

tappet shifts the slide valve so that steam is exhausted from the forward end of the cylinder and admitted to the rear end. This shifts the small upper piston, and causes the lower piston to bring the yoke bar into contact with the wheel, whose motion is continued in the same direction. To reverse the engine, the steam entering the forward end of the main cylinder is conducted by a cross pipe so as to act upon the lower small piston; a similar cross pipe leads the steam from the rear end of the cylinder to the small

upper cylinder. At the junction of the cross pipes with the main pipes there are valves (shown in section in the main view), which can be turned so that steam from either end of the main cylinder can be made to enter either of the small cylinders. The lower cut shows the upper small cylinder in section.

This invention has been patented by Mr. B. T. Webb, of Beaufort, N. C.

Coffee Eating Habit.

A correspondent of the *Medical and Surgical Reporter* mentions the case of a young woman of twenty-two who had acquired the habit of eating roasted coffee beans. Though the habit was only of four months' standing, she had eaten as much as half a pound a day, and had only decreased to 4 ounces per day on the earnest solicitation of friends. The effect on her health had been that she became pale, sallow, and nervous; the pulse weakened, the stomach got out of order, and, among other symptoms, there was marked dyspnoea in going up stairs. An attempt to stop the habit was followed in a few hours by intense nervousness, trembling, and a strong desire for coffee.

The Towers of Silence.

Colonel Floyd-Jones, writing from India to the *Military Service Journal*, gives an interesting description of the "Towers of Silence" near Bombay, and the Parsee mode of disposing of the dead. The Parsee is a devoted fire worshiper, and most of his prayers are offered at morning and evening, facing the sun. It is perhaps in consequence of this belief that he is so careful in preventing the pollution of the other elements, and that after death his body is placed in an open tower, usually on some eminence, where it is devoured by vultures. These open sepulchres have been appropriately named the "Towers of Silence." In every Parsee dwelling house there is an aperture in the upper or sleeping story, which is usually covered by a grating; but when a member of the household dies, his body is placed on a bier and lowered through the aperture to the ground floor, where it is cared for by a set of priests called Neor-ser-sala, or death men, who prepare the body and clothe it entirely in white. Before the body is removed from the house, however, the forehead is smeared with a species of clarified butter, or "ghee," and the dog of the house admitted. Should the animal lick the butter, it is regarded as a good omen of the departed's future happiness, but its refusal would signify perdition. The death men have no contact with the world at large, and on no account are they admitted to the house, as their presence would

pollute it. Hence it is that the body is lowered to them, in order to make their entrance unnecessary. A procession is then formed, the friends of the dead following the priests to the Towers of Silence, on Malabar Hill. Arriving at the entrance of the grounds, the body is taken in charge by another set of priests, with long beards, who carry it to whichever of the five towers may be selected by the last set of priests. The body is taken through an aperture in the wall of the tower and deposited on a grating. There are three sets of these, one for men, signifying good deeds, one for women, representing good words, and one for children, indicating good thoughts. The

clothing is then removed and torn into pieces, after which it is thrown into another tower and the bodies exposed to the vultures. In a few minutes the birds have stripped all the flesh from the bones. Everything about the grounds is kept as neat as possible, and flowers grow in pretty gardens near the entrance. It is very curious that a religion which otherwise contains so much that is elevating should countenance a mode of burial at once so unnatural and repulsive.