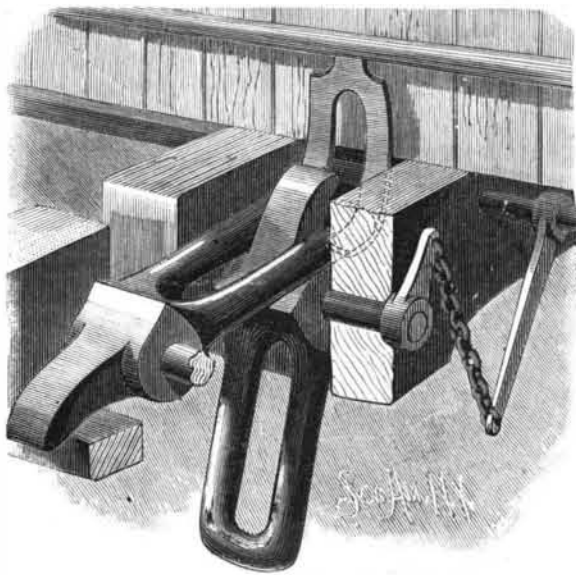


CAR COUPLING.

The accompanying engraving represents a car coupling which has been patented by Mr. A. H. Boies, of Hudson, Mich. In a central vertical slot in the drawhead is a combined coupling hook and link rigidly connected to a shaft passing through the drawhead. To the shaft are secured arms, connected by chains with arms on a shaft mounted in proper bearings secured to the under side of the car. By turning this shaft in the

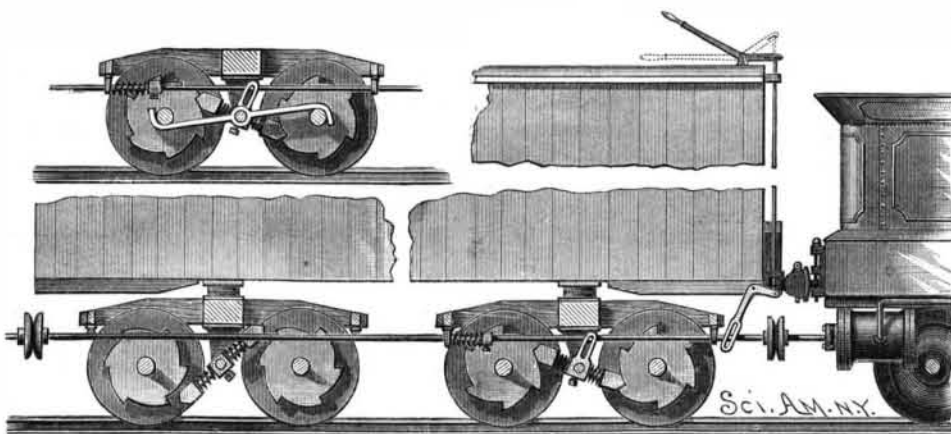


BOIES' CAR COUPLING.

proper direction, by means of crank handles at either end, the links may be elevated. A second shaft is mounted in bearings in the end of the car, and is provided with a forked arm whose fingers press, when thrown upward, upon each side of the hook. To operate this coupling, one of the links is allowed to assume a vertical position, with its link portion resting against a stop extending across the lower part of the slot in the drawhead. The link of the approaching car is elevated so that its link will drop over the hook of the other coupling. To uncouple the cars, the upper shaft is turned so as to throw the fingers of the fork forward and upward, so that they will raise the link from the hook. It will be seen that the cars may be coupled and uncoupled without entering between them.

CAR BRAKE.

This brake is designed for use in connection with passenger cars as an auxiliary brake, adapted to stop



MORROW'S CAR BRAKE.

the train suddenly when necessary. When used in connection with freight cars, it serves all the purposes of an ordinary brake, and yet is capable of instant application, to thoroughly brake the train when moving at a high rate of speed. Fastened to the axles of the car near the inner face of each wheel is a second wheel, formed with a toothed periphery, as shown in the engraving. These wheels are so placed that the vertical faces of the teeth of the wheels on one truck will face in a direction the reverse of the vertical faces of the wheels upon the other truck. Between the axles of each truck is mounted a shaft, carrying blocks formed with oppositely extending arms, held in line with the toothed wheels. These arms are encircled by springs bearing against angular faced brake shoes, adapted to slide a limited distance upon the arms. The springs relieve the shoes and arms from the sudden shock brought to bear upon them when the simultaneous engagement of the shoes at each end of the brake is made with the teeth of the wheels between which the brake is centered. Each set of brakes operates independently, that is, the brakes on the forward truck are operated while those upon the rear one are idle, and vice versa. Supported at each side beneath the car, and between the car wheels and toothed wheels, is a rod. The ends of these brake rods project beyond the ends of the car, and are provided with buffers. The rods are provided with springs and are suitably connected with the brake blocks, so that the shoes are normally held out of engagement with the toothed wheels.

The rods are adapted to be operated upon by a piston in a steam cylinder placed under the tender of the engine, the ends of the piston rods being furnished with buffers similar to those on the brake rods. The return stroke of the piston is made by a spring, which thus obviates the necessity of introducing steam at both ends of the cylinder. When steam is admitted to the cylinder, the piston rod is forced out, and the brake rod upon the first car is moved. This in turn communicates the motion to the next car, and so on throughout the train. This rearward movement of one of the rods causes the shoes on the forward trucks to engage with the toothed wheels, and thereby almost instantly stop the train. The consequent shock is somewhat relieved by the wheels of the rear trucks, which are left free to revolve. By means of simple connections the brake can be operated from either the top or platform of a car. Provision is made for preventing the bending of the axles under the strain brought upon them.

This invention has been patented by Mr. John Morrow, whose address is P. O. Box 88, Philadelphia, Pa.

One Hundred Years.

At the recent celebration of the hundredth birthday of M. Chevreul, the distinguished French chemist, he was presented with a copy of the number of the *Gazette Royale* published on the day he was born, in September, 1786. Commenting on the contrast of "then and now," the *Paris Figaro* reminds its readers that to realize the width of the gulf which is spanned by the life of this single man, they must remember that on the day of M. Chevreul's birth Marat was veterinary surgeon to the royal mews at Versailles, Danton and Robespierre were obscure provincial lawyers, Murat was preparing to enter a religious order, Ney was eking out a scanty existence as a copyist, and Bonaparte had just received his commission as second lieutenant of bombardiers of Autun, in the Regiment de la Fere. Frederick the Great of Prussia had died only a few days before Chevreul was born, Joseph II. was Emperor of Germany, Catherine II. Empress of Russia, Gustavus III. King of Sweden. The bare enumeration of these names tells how completely France and Europe have been transformed. During his century of life M. Chevreul has seen three Kings of France, one King of the French, two Emperors, three Republics, 65 Marshals, 66 Ministers of Justice, 75 Ministers of Marine, 84 Ministers of War, and 92 Ministers of the Interior—or one for about every 13 months of his life.

APPARATUS FOR CLOSING APERTURES IN THE HULLS OF VESSELS.

The invention here illustrated is intended to provide practical means whereby a breach in a vessel's hull, from a collision or other cause, may be effectually closed from either the inside or outside of the vessel. For closing the opening from the outside a frame made of any appropriate size and weighted to sink in the water is used. To the edges of one side of the plate are secured wooden strips, attached to which are cushions of rubber or other suitable material. The frame is lowered over the apertures from the deck by ropes secured to eyes in one edge. The pressure of the water causes the plate to hug the hull, so that it will prevent all, or nearly all, the inflow of water to the vessel, the cushions forming water tight joints between the hull and frame. The inner surface of the plate is provided with several bolts, to which ropes may be attached, in order to secure the plate in place from the inside of the vessel.

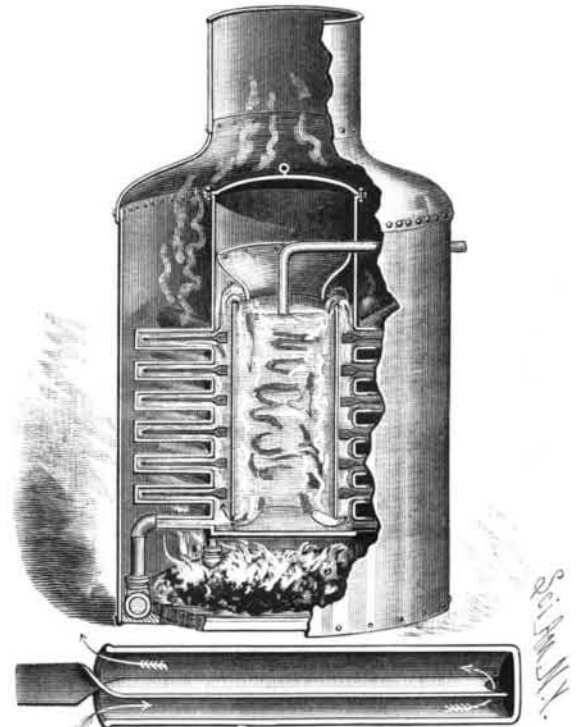
In Figs. 2 and 3 the frame is applied from the inside to close an opening in the bottom of the vessel, while in Fig. 4 a side opening is closed from the inside. In these cases a brace bar is arranged to be held across the opening in such a way that a screw passing through its center can be forced against the plate placed over the aperture.

This invention has been patented by Mr. John Speirs, of 92 Zabriskie St., Jersey City, N. J.

To produce a good gloss on linen, pour a pint of boiling water upon two ounces of gum arabic; cover it, and let it stand over night. A teaspoonful of this is added to the starch.

STEAM GENERATOR.

Placed centrally within the boiler shell is a closed cylinder, provided with horizontal tubes placed radially. In each of these tubes is placed a horizontal partition having a curved outer end which establishes communication between the upper and lower chambers. The inner end of each partition projects beyond its tube and is twisted at right angles (as represented in the lower figure), and extended close to an annular partition which is placed inside of the cylinder, and is open at the top and bottom. A short distance above the upper edge of this partition is placed a curved annular flange, secured to the inside of the cylinder. The cylinder is supported by pipes opening into the cylinder, and which connect at their lower ends with a circular pipe placed around the grate bars between the latter and the shell. The sup-



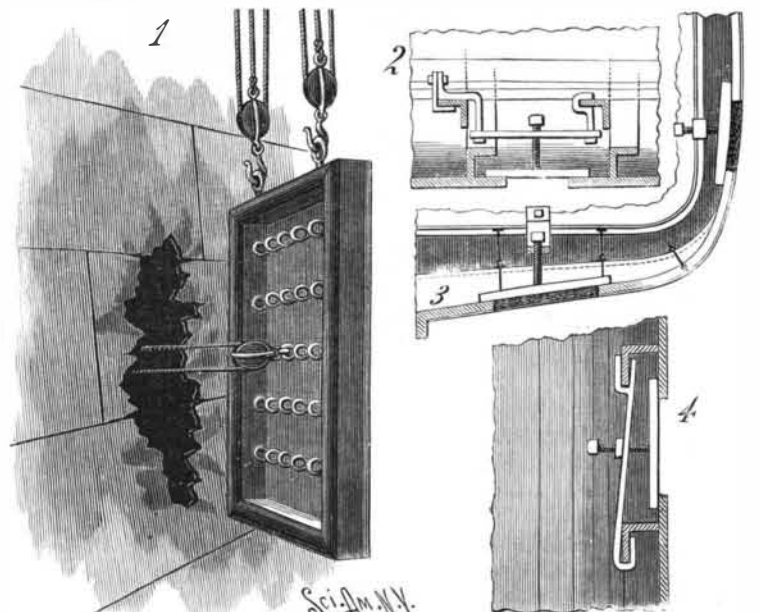
STUTSMAN & COLE'S STEAM GENERATOR.

ply pipe opens into the annular partition a short distance below its top. The cylinder is provided with the usual steam outlet pipe, safety valves, etc., and the shell has the usual smoke stack, doors, etc.

The cold water enters the annular partition, descends toward the bottom, and is heated by the fire; it then passes into the space between the partition and cylinder. From there it rises either directly upward or into the lower chambers of the lower tubes, passes to the outer ends and then back through the upper chambers; then through the upper tubes, until it reaches the edge of the annular partition, over which it flows. The curved flange prevents the water from splashing against the dome of the cylinder and directs the flow of water from the outside to the inside of the partition. The water is rapidly heated in its passage through the tubes, and the sediment flows from the cylinder into the tubes, and finally settles in the circular pipe at the bottom.

This invention has been patented by Mr. Henry Stutsmann and David Cole. Particulars can be had by addressing the latter at Portland, Oregon.

THE *Age of Steel* understands that \$80,000 has been offered for a patent just issued to a Pittsburg gentleman for a rod rolling mill. The mechanism is simple, and combines both the drawing and rolling processes, accomplishing the work in a rapid and most satisfactory manner.



SPEIRS' APPARATUS FOR CLOSING APERTURES IN HULLS OF VESSELS.