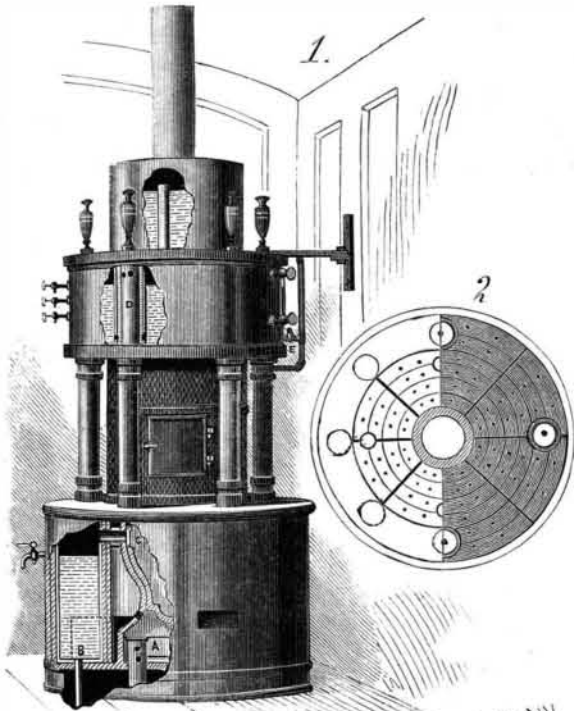


AN IMPROVED CAR STOVE.

A stove for heating railway cars, provided with appliances for extinguishing the fire in case of accident or of the extraordinary tipping of the car, has been patented by Mr. William P. Wheeler, of No. 814 West Madison Street, Louisville, Ky., and is illustrated herewith, Fig. 2 being a sectional view through the two upper annular water reservoirs. Within two annular plates on the base plate is a water reservoir surrounding the fire pot, under which air tubes, A, pass through the car floor, a pipe, B, from the reservoir providing for drainage when desirable. Heat-insulating material is placed between the reservoir and its surrounding plates, and the reservoir is divided perpendicularly by perforated partitions and horizontally by perforated shelves. To the top of the stove wall is fitted a ring which supports a second annular water reservoir, and pipes, D, extending through it, communicate with the reservoir below, these pipes surrounding long bolts which securely bind together the two reservoirs and the stove. Between the upper part of the lower reservoir and the fire pot, at A, are short tubes, with an automatic valve over the mouth of each, capable of opening by a slight pressure of water and closing by its own gravity, and the pipes, D, also communicate with these tubes. In the second reservoir each pipe, D, has a surrounding pipe, the inner and outer pipes forming

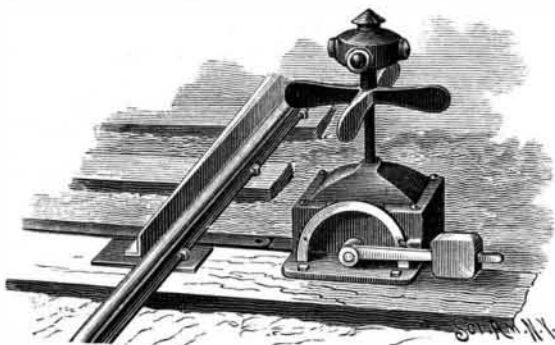


WHEELER'S CAR STOVE.

a siphon adapted to draw water from the reservoir when the stove is unduly inclined to one side, as by an accident or collision, when both reservoirs will be discharged into the fire pot at A. When the water is exhausted in these two reservoirs, by evaporation or otherwise, it is replenished from the upper reservoir by opening a valve provided for such purpose. The second reservoir has try-cocks at different heights, and a water gauge to determine the level of the water, and the two upper reservoirs have wave arresters to prevent undue movement of the water when the stove is in its normal condition.

IMPROVED RAILWAY SWITCH STAND AND SIGNAL.

An improved switch stand, in which the signal is automatically changed as the switch is moved, has been patented by Mr. Nathaniel W. Boyd, of Steelton, Pa., and is illustrated herewith, as applied to a point or split switch, a different application of the improvement having been illustrated by us in a former number. The principal operative portions are inclosed in a metal case, to exclude dirt, snow, ice, etc., there being spaced ribs in the bottom of the casing, and a



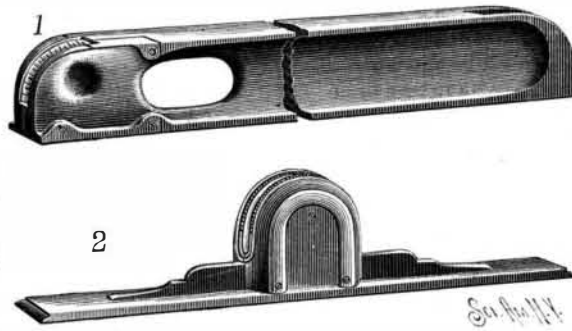
BOYD'S RAILWAY SWITCH STAND AND SIGNAL.

friction roller, upon which slides a rack bar projecting through slots in the casing and connected with the switch bar, which extends under the main rail to the switch points. The stand is mounted directly upon a single tie or sleeper, and may be set up on either side of the track, a half revolution of the lever giving the

signal shaft a quarter turn, whereby the different colored sides of the lantern or wings of the semaphore are displayed.

AN IMPROVED SPIRIT LEVEL.

A level designed to be in condition at all times to indicate a level or plumb, or any required angle, without



HUTTON'S SPIRIT LEVEL.

the manipulation of set screws, etc., and wherein the vial is so set as to be absolutely protected against hard usage, has been patented by Mr. James C. Hutton, and is illustrated herewith, two forms of construction being shown. The ends of the main frame, in which the vials are set, as represented in Fig. 1, are divided into two sections, one of which is detachable, the fixed section having a circular recess, a segment of which is countersunk for the reception of a bed of plaster of Paris to receive a vial case. The latter is circular, and made in sections, with a segmental depression and central aperture for a pivotal screw, by which the vial case may be revolved when it is placed between the case sections, to bring it in proper position between the plumb and level marks on the top and end edge of the frame, there being degree marks upon the surface between these points. The vial case, as well as the case sections, provide for the thorough and accurate embedding of the vial in plaster of Paris, whereby a strong, durable, and immovable setting is obtained. For greater convenience in some kinds of work, Fig. 2 shows a construction in which the vial is located centrally, and in which the bead may be seen from either side. The vials used may describe a true half circle, or be made more or less of a horseshoe form. In this kind of level, no matter what the inclination or how the instrument is placed, the degrees may be readily observed and the bead seen.

For further information relative to this invention address Mr. James C. Hutton, of Corvallis, Oregon, or Mr. Patrick J. McElroy, of East Cambridge, Mass.

Spanish and Italian Ships Built by the English.

The three new cruisers for the Spanish government are to be built at Bilbao by the Barrow Shipbuilding Company, which has started a branch establishment at that place. The Spanish government insisted upon building the vessels in Spain, and this will now be accomplished; but they will not be built by Spaniards all the same. The Barrow Company is now designated "The Naval Construction and Armament Company, Limited," and will undertake the manufacture of ordnance as well as the construction of war ships. It is worthy of remark that although these cruisers, which are to be very powerful and steam at a high rate of speed, are to be built at Bilbao in Spain, yet the whole of the machinery, boilers, torpedo boats, Whitworth and Nordenfelt guns, are to be supplied from Barrow.

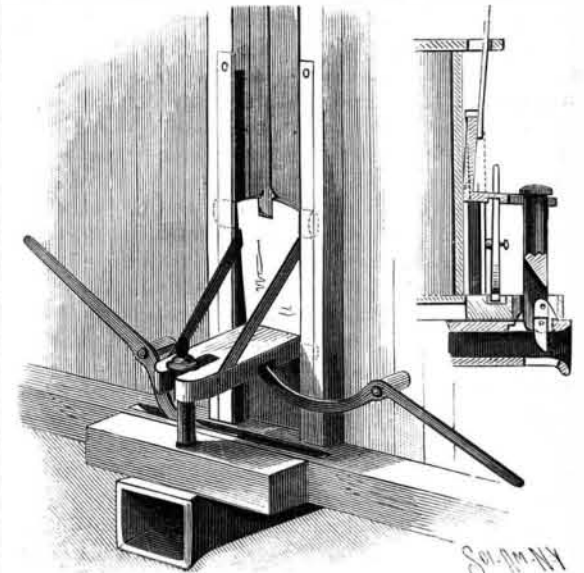
The Italian government are adopting a similar course in regard to the construction of steam machinery for their monster armorclads. Having determined to make their engines and boilers at home, their intentions are fulfilled by intrusting the contract to a branch, established at Naples, of the Tyneside firm of Hawthorn, Leslie & Co., under the name of the "Societa Hawthorn-Guppy." This branch of the Newcastle firm are now making twin screw engines of 23,000 horse power for the armorclad Sardeque; but in this case also, the design and all the principal castings and forgings are being supplied from the parent establishment in this country.—Broad Arrow.

The Radio-Microphone.

Mr. C. Vernon Boys has described before the Royal Society an instrument for measuring very small changes of temperature. "It is an extremely delicate form of thermopile, consisting of a square frame made of one turn of one square centimeter, of which three sides are thin copper wire, and the fourth is a compound bar of antimony and bismuth, each piece being $5 \times 5 \times \frac{1}{8}$ mm., soldered edge to edge. This frame is supported by a thin rod to which is fastened a mirror, and the whole is hung by a torsion fiber in the field of a powerful magnet. When radiant energy falls on the center of the compound bar, the frame is deflected, and the amount of deflection measures the energy. Adopting suitable dimensions, and using a very strong field, an instrument may be made capable of showing a change of temperature of the junction of one thousand-millionth of a degree."

AN IMPROVED CAR COUPLING.

A car coupling designed especially for use in connection with freight cars, and in which the parts are so arranged that the cars may be coupled or uncoupled from the sides or top, has been patented by Mr. Samuel Byrne, of No. 158 Robert Street, Toronto, Canada, and is illustrated herewith, the small figure showing a central longitudinal section of the coupling. The end of the car is provided with vertical ways, in the grooves of which is mounted a slide having upper and lower guiding lugs, the slide carrying on its lower end an outwardly extending plate, slotted to receive the shank of the coupling pin and transversely grooved to receive the lower ends of levers loosely mounted upon studs at either side. The ways are formed with recesses adapted to receive the lower guiding lugs of the slide when it is lifted by either of the levers at the side, as shown in the perspective view, to maintain the pin in raised position, the handle of the lever, as it is thrown downward in moving the slide, being also moved outward from the car body. The lower end of the coupling pin is also provided with a gravity catch, engaging a shoulder of the drawhead, to be used in arranging the coupler for coupling cars automatically, the slide being then lowered sufficiently for such purpose, when a link within the drawhead may be pulled out, but an entering link will cause the pin to drop and engage such

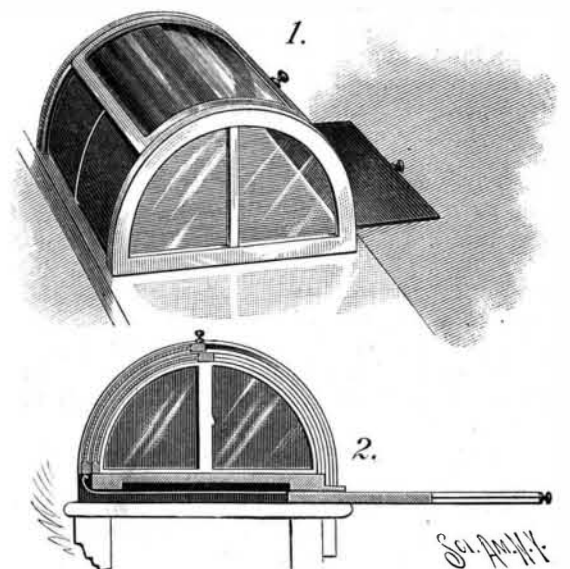


BYRNE'S CAR COUPLING.

link. A handle extends upward, whereby the slide may be operated from the top of the car, as well as by the levers at the sides.

AN IMPROVED SHOW CASE.

A show case having a shelf operating in connection with a sliding cover, and designed to be strong, durable, and attractive, has been patented by Mr. James J. Kelly, of No. 130 Lark Street, Albany, N. Y., and is illustrated herewith, Fig. 2 representing a central transverse section of the show case and shelf. The body of the case is segmental in contour, having an inner fixed bottom and an outer bottom which may be conveniently attached or detached to facilitate cleaning. The outer bottom is recessed, and has grooved side walls, to receive a shelf with tongued ends sliding in the grooves, while a half cover is rigidly secured in the segmental end pieces of the frame. The end pieces project beyond this cover, and in the extended portion are grooved to receive a sliding half cover, both covers being adapted to hold frames of



KELLY'S SHOW CASE.

glass. Centrally to the rear of the sliding cover is attached a cord or chain, which extends downward in a transverse groove upon the fixed cover, and is secured at the other end to the rear of the sliding shelf, so that when the cover is drawn out the sliding cover is raised, and when the cover is closed the shelf is drawn in.