IMPROVED RAILWAY SWITCH SIGNAL.

The invention herewith illustrated is a new apparatus for moving switches, which is so constructed that it is impossible to move the lever without the latter turning the colored light or flag so as to indicate the position of the switch to approaching trains. This is effected by mechanism which causes the lever to turn one quarter of a revolution whenever it is altered, and thereby to rotate the lantern or flag attached to its upper portion.

The lever, as shown in Fig. 1, is made in two parts, the lower one of which is attached below to the rod leading to the switch, and above is forked. The upper part of the lever is pivoted at the fork of the lower part, as shown in Fig. 2, and is supported by a cap at A. Said upper portion carries the red and white lantern and flag as shown, so that, when rotated one quarter revolution on its vertical axis, the change may be made from white to red signal, or *vice versâ*. Formed on the lever is a rounded lug, B, Fig. 2, which, when the lever is perpendicular, enters a curved recess, C, Fig. 1, in the upper edge of the top bar of the switch stand. It will be obvious that, when the lever is moved in either direction, the lug, in leaving the recess, will cause the lever shaft to make a quarter revolution. On the under side of the upper bar of the switch stand, and just beneath the recess, C, is a lug, D. Also on the lever shaft are ears, E. When the lever is moved from an inclined to a vertical position, the ears, E, strike against the lug, D, and turn the lever so that the lug, B, is caused to enter the recess, C. It will be clear also that, when the lever is thrown completely over from end to end of its frame, by the means already described, it will be turned half a revolution.

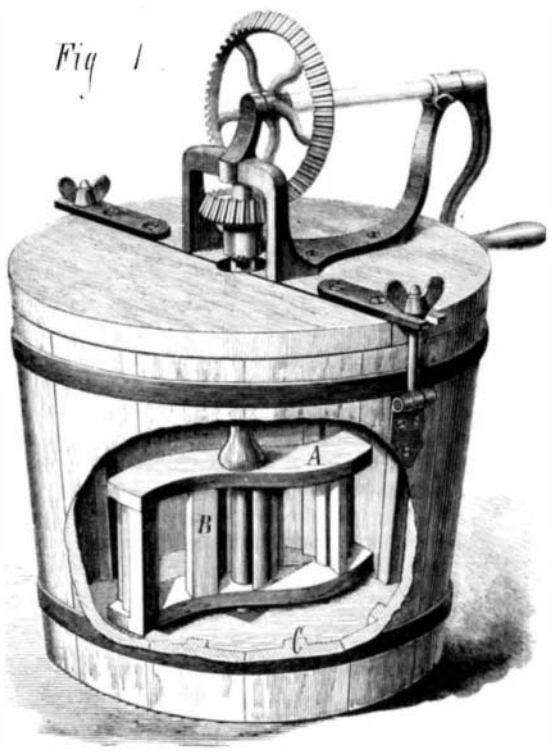
By this mode of operating the switch, the last displacement, even to one third of an inch, is indicated by the signals being turned, so that it is practically impossible for the switch tender to set the switch wrong without the same being clearly shown. There are no extra movements beyond those ordinarily required, namely, to unlock, throw back, and lock the lever. Patented through the Scientific American Patent Agency. For further particulars relative to rights to manufacture, etc., address the inventor, Mr. Charles W. Spayd, Box 620, Wilkesbarre, Pa.

Hard Paper.

French manufacturers have a method of rendering paper extremely hard and tenacious by subjecting the pulp to the action of chloride of zinc. After it has been treated with the chloride, it is submitted to a strong pressure, thereafter becoming as hard as wood and as tough as leather. The hardness varies according to the strength of the metallic solution. The material thus produced can be easily colored. It may be employed in covering floors with advantage, and may be made to replace leather in the manufacture of coarse shoes; it is also a good material for whip handles, the mounting of saws, buttons, combs, etc. A great deal is used in large sheets for roofing. Paper already manufactured acquires the same consistence when plunged, unsized, in a solution of the chloride.

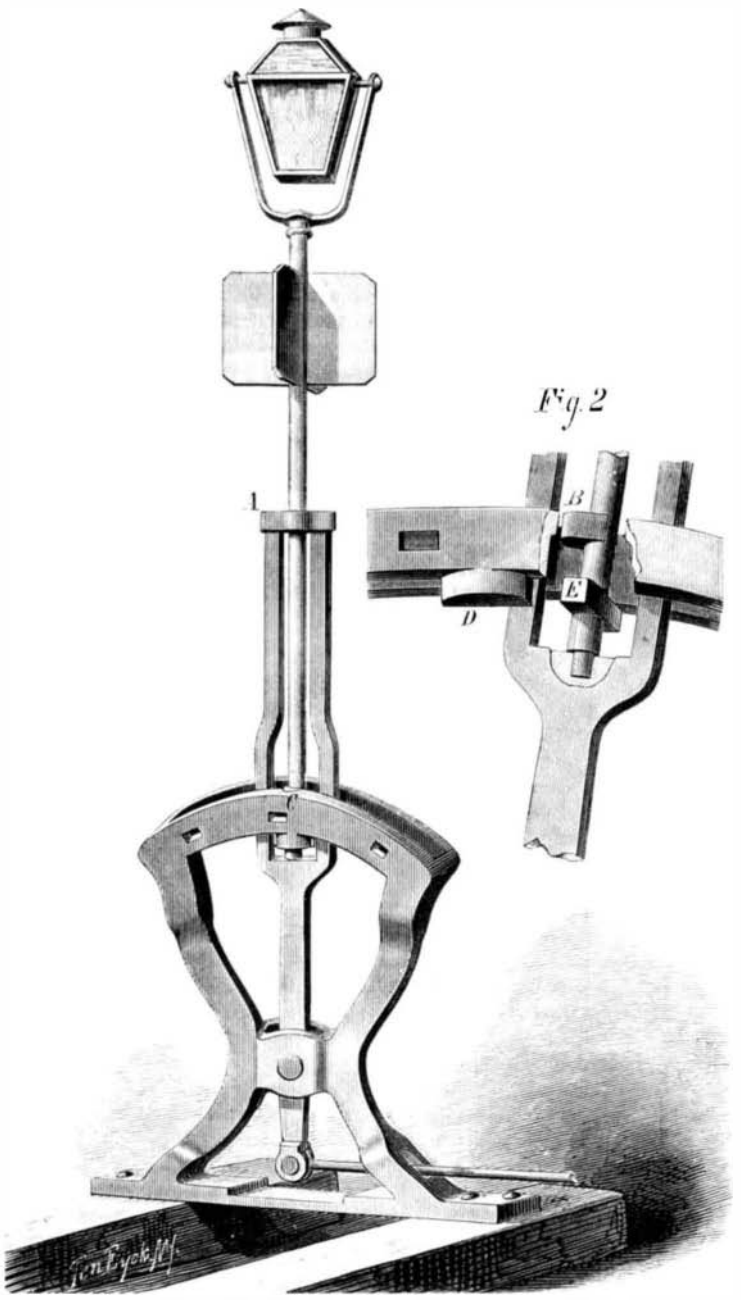
SHEPHARD'S IMPROVED CHURN.

We illustrate herewith a churn of novel construction patented through the Scientific American Patent Agency, March 28, 1876, by Mr. E. W. Shephard, of Wilmington, Ohio. The arrangement of parts is such that the cream is thrown



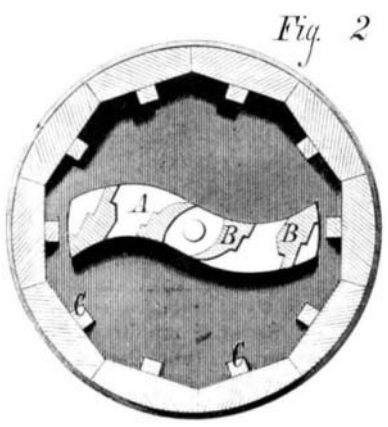
into violent agitation, while swift currents are set up and instantly broken, so that the butter is brought, it is claimed, with great rapidity.

The body of the churn is formed of ten staves, flat on their inner sides, as shown in the section, Fig. 1, so as to produce a number of interior angles. In the bottom of the vessel is an antifriction socket to receive the dasher shaft, to the lower part of which shaft are attached the S-shaped crossbars, A, Fig. 1. Between said bars are secured four upright paddles, B, placed with their forward edges inclined inward, and rabbeted or concaved on the sides, as shown in section in Fig. 1.



SPAYD'S RAILWAY SWITCH SIGNAL.

By means of the simple arrangement of crank and bevel gearing shown above the churn, the dasher is swiftly rotated, and the currents produced in the cream are broken by the angles in the churn body, and also by the ribs, C, arranged around the interior. The mode of securing one half of the



churn cover is plainly exhibited in the engraving; the other half is loose, so that it can be taken off to allow of the inspection of the progress of the churning.

For further information, the inventor may be addressed as above.

Bleaching Shellac.

Lemming's method for the purification or bleaching of shellac consists in either boiling with, or filtering the hot alcoholic solution through, well burnt and recently heated animal charcoal. When necessary, this operation is repeated until the solution is colorless, when it is filtered through fine silk, and finally through fine filter paper. To insure success, the solution should be in the proportion of about five ounces of shellac to one quart of alcohol (rectified spirits of wine). Dr. Hare published a method for bleaching the lac by means of chlorine. He dissolved one part of shell or seed lac in a boiling solution of one part of pearlash in about eight parts of water. The solution was then cooled and impregnated with chlorine gas till the lac was all precipitated. The precipitate thus obtained is white, but the color deepens by washing and consolidation; dissolved in alcohol, lac bleached by this process yields a varnish which is as free from color as any copal varnish. The application of chlorine must be made by a person acquainted with chemistry. Hence chloride of lime is safer as a bleaching agent, the lime being afterward dissolved out from the precipitate by dilute muriatic acid.

Atmospheric Ammonia.

M. Schloesing has recently studied the exchange of ammonia which takes place between water and the atmosphere. The water which condenses in the clouds and which falls in rain would at first sight appear to despoil the air of all the ammonia contained. Such, however, is far from being the case. Sixteen analyses conducted at different temperatures show that the water never dissolves all the atmospheric ammonia. At 77° Fah., the water takes up but 3 per cent of the total amount of ammonia in the air; at 68°, 4 per cent; at 59°, 6 per cent; at 50°, 11 per cent, and finally, at 41°, 19 per cent. From this it appears that, the lower the temperature, the greater is the amount of ammonia dissolved.

THE BENTON PATENT COPPER FLOAT.

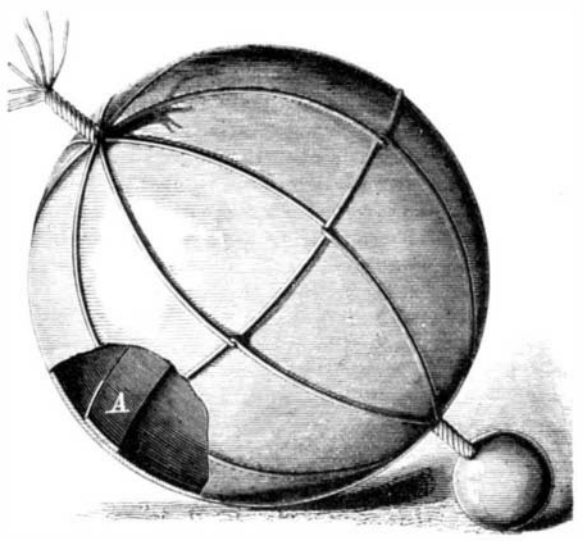
In the annexed engraving is represented a copper float, such as is used in steam boilers, etc., made by a new process. The manufacturers claim that the float is the only one yet invented which will stand the action of steam in a boiler for any length of time, without leaking and becoming filled with water, and consequently useless. The device, it appears from actual test, is extremely strong, and is altogether indifferent to the effects of sudden and wide changes of temperature.

Two hollow hemispheres are spun out of sheet copper of suitable thickness. These are connected at their circumference by being slipped upon a circular ring, A, that is slightly beveled at the edges, to correspond with the curvature of the hemispheres. The latter are also beveled so as to bind intimately on the ring when they are driven thereon.

The float is next suspended in a galvanic copper solution, and a perfect joint is made by the filling up, with copper, of the beveled edges of the hemispheres. The float is then removed, and such of the solution as has entered the interior is blown out through two small holes, bored for the purpose. These holes are then plugged and the plugs, covered with a thin film of copper, by again placing the globe in the solution. A second layer may also be deposited over the joint to secure the strong and perfect connection of the parts.

The test to which these floats are subjected are very severe. They are first placed in a steam-tight tank, into which steam is admitted until they are highly heated, the water of condensation being constantly drawn off. The steam valve is then shut, and cold water is suddenly admitted until the tank is about three fourths filled. The lower half of each float under test is thus suddenly covered, while the upper half remains hot. Under these conditions, we are informed, no sighs of separation at the joint, through contraction or expansion of the metal, appear. The floats are also tested with a cold water pressure of 400 lbs. to the square inch. The manufacturers state that they have experimented with the joint by beating out the copper until it was as thin as tissue paper; and that they will guarantee it to stand until the copper itself is eaten away. Our engraving shows a mode of slinging the float in copper wire, to which a brass is attached to keep the device in proper position.

Patented through the Scientific American Patent Agency, February 1, 1876. For further information address the



manufacturers, Messrs. Benton, Gore & Co., Milwaukee, Wis.

GREASE can be removed from billiard or other cloths by a paste of fuller's earth and turpentine. This should be rubbed upon the fabric until the turpentine has evaporated and a white powder remains. The latter can be brushed off, and the grease will have disappeared.