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Improved Switch Signal and Alarm.

The most careful men are liable to mistakes. The deeply cut grooves of habit and method may at times be left for some erratic course, and where human weakness fails we must depend upon the infallibility of mechanism. Carelessness and thoughtlessness become criminal where human life is at stake, and this is particularly the case with the railroad switchman. Many lives are annually sacrificed and much property destroyed for the want of some reminder of duty to the switchman and some timely signal to the engineer of a train. A patent for such a device was secured through the Scientific American Patent Agency by Thomas S. Hall, of Stamford,

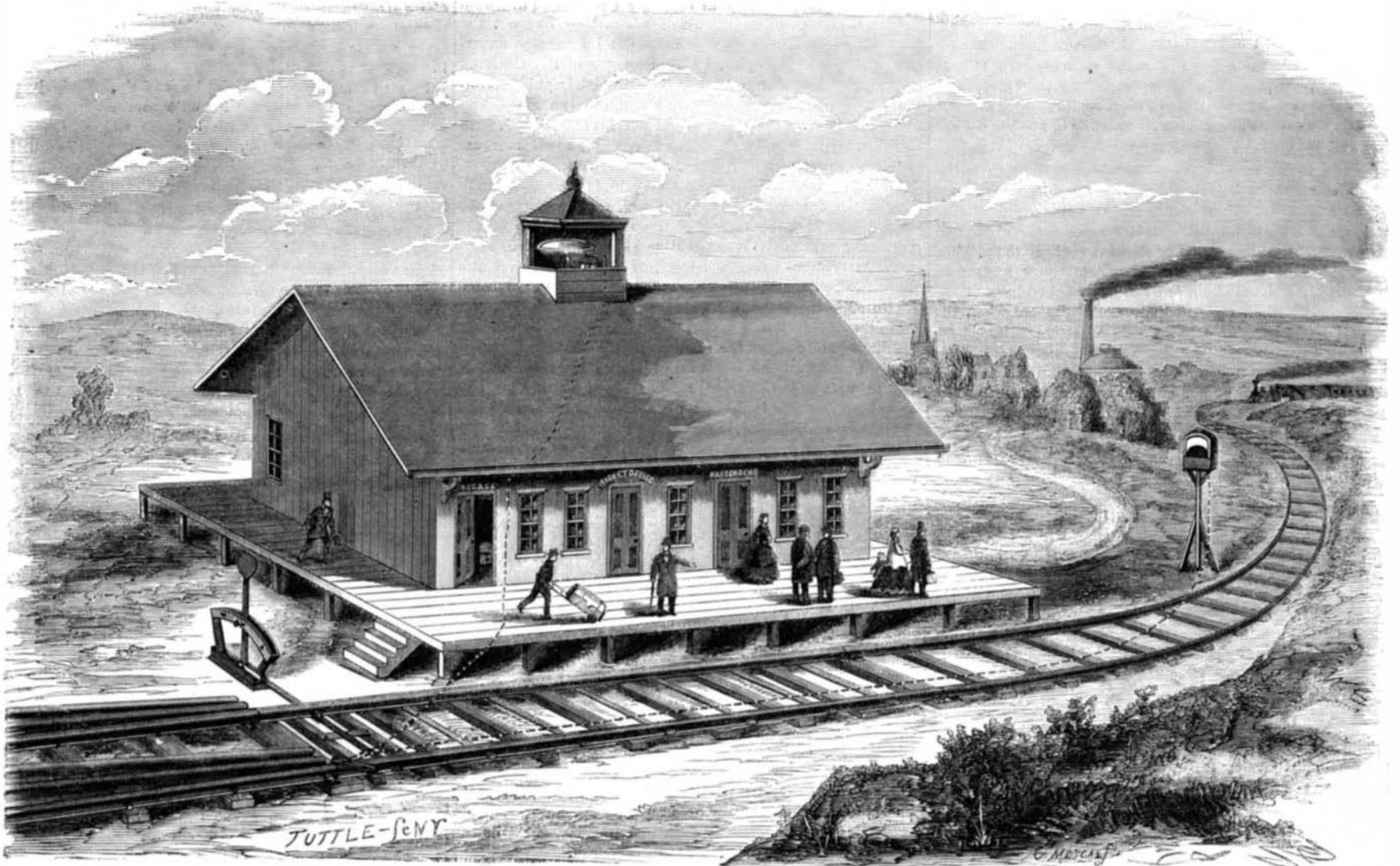
reminders of his duty if he neglects to replace his switch, or that some employe will have his attention directed to the oversight.

In addition to this alarm addressed to the ear, a signal is shown simultaneously with the alarm by similar means. In the engraving the signal is shown on a post at a distance from the switch sufficient to enable the engineer to stop his train before reaching the switch. In the daytime this is the ordinary red and white signal, and in the night the red or white light. Of course this signal may be placed as far away from the switch as may be desired, the connection being made by the wire passing under ground.

This device may be seen in operation at the Merchants'

der; B, man hole plate through which the cylinder is charged and emptied; C, a truck upon which there is a fire; *d d*, side walls upon which the cylinder rests; E, steam gage; F, belt wheel; G, safety valve.

The powdered quartz, mercury and sufficient water are placed in the cylinder, which is then closed air-tight and made to revolve slowly over the fire until the steam gage indicates 70 or 120 lbs. steam according to the nature of the quartz. If the quartz does not contain much refractory ore, 70 lbs. of steam is sufficient, if it does contain much, 120 lbs. of steam is necessary in order to thoroughly desulphurize and liberate the gold and silver. As soon as the required amount of steam is



HALL'S SWITCH SIGNAL AND ALARM.

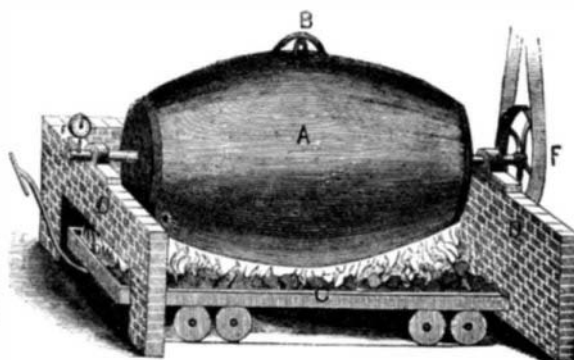
Conn., Feb. 26, 1867, and is now in successful operation on a portion of the New York and New Haven Railroad.

The switch is worked by a hand lever in the usual way. On the under side of one of the rails, at its free end, is a downward projecting pin which engages with a horizontal lever by means of a slot near one end of the lever. To the other end of the lever is secured a cylindrical pendant plug, having on its lower end a snug with two parallel sides that fit in a suitable pipe of metal sunk in the ground, the top of it at the surface. A cap with rubber packing prevents the entrance of moisture into the tube. Below the lever plug is a wooden cylinder having two metal plates secured to its sides but not touching the tube, and projecting above the wooden cylinder on each side of the parallel sided snug. Now it will be evident that if the switch is shifted, the horizontal lever at the surface of the ground will be correspondingly moved with the switched rail, and the snug will be turned so that two opposite corners will come in contact with the projecting metal plates on the wooden cylinder. Consequently, if these plates are connected by insulated wires, one with the pole of a battery and the other with an electro magnet, the circuit may be closed or broken as the switch is moved in one or the other direction. This is precisely the principle and the operation of this device. The wires are enclosed in an insulating material and carried under ground (for explanation in the engraving, shown above ground) to a battery and gong or bell placed in a cupola on the roof of the station house, as in the engraving, or in any other convenient place to give an alarm. When the switch is in line with the main track the circuit is broken and no alarm will be given, but when the switch is misplaced the circuit will be completed and a hammer will vibrate against the gong and continue the alarm so long as the switch is off the main line. It will be seen that the switchman will thus have a perpetual

Union Express Company's Office, 365 Broadway, corner of Franklin street, New York City. It is being introduced already on several railroads, and as there is no machinery to get out of order and the cost of keeping in operation is only that of replenishing the batteries once in two or three months, and its operation is certain, it may be considered as an effectual preventive of accidents from misplaced switches and the draws of bridges to which it can be as readily attached. Any inquiries addressed to the patentee at Stamford, Conn., will meet with prompt attention. Patents have been secured in foreign countries through this office.

A NEW AMALGAMATOR.

The accompanying engraving represents a new amalgama-



tor and desulphurizer. Recent trials have been made upon some of the most refractory ores with remarkable results, so much so that its owners anticipate a complete revolution in gold and silver mining. A, represents a wrought iron cylin-

der until cool. It is then opened and emptied and is ready to repeat the operation. The machine will treat from 1500 to 2000 lbs. of quartz at a time, inside of three hours, at very little expense.

It is claimed for the above process, that the steam not only desulphurizes but drives the heated mercury through the quartz in every direction, and the revolving of the cylinder constantly intermingles the quartz and mercury, so that every particle of the gold and silver must come in contact with the heated mercury and consequently be taken up, thereby accomplishing a most perfect system of amalgamating and desulphurizing. Patented Dec. 22, 1865. Address John I. Staats, Patentee, 83 Amity Street, New York.

Cast Iron Boilers.

A correspondent from Indianapolis speaks unfavorably of cast iron boilers of the Harrison style, because one of cast iron rings which he used proved inefficient. He says his boiler was a series of circular pipes, one above the other, and connected at three points in the circle by upright tubes through which passed wrought iron bolts secured by nuts at top and bottom. These bolts, under pressure, would expand and the joints of the pipes leak badly, and at length one of the pipes burst. When taken apart the interior of the pipes had a coating three-eighths of an inch thick. The fire was made inside the coils.

Such a boiler we should expect to be a failure, but except being made of cast iron and bolted together we cannot discover any points of resemblance on which to make a comparison with the Harrison boiler.

RUBBER-CEMENT.—Caoutchouc 3 parts, naphtha 34—heated and stirred to solution—then add finely powdered shellac 64 parts.