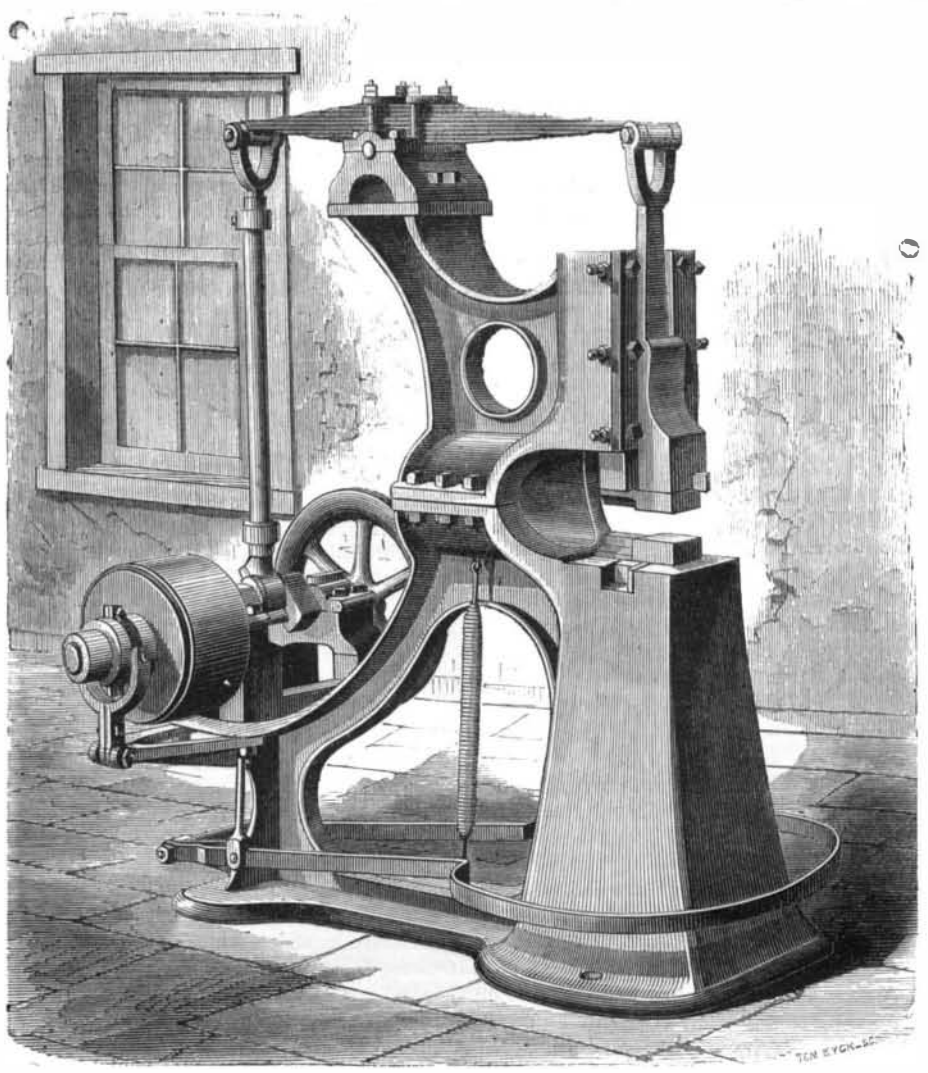
PALMER'S POWER SPRING HAMMER.

In the illustration is presented a view of Palmer's power spring hammer, an invention, it is claimed which has the advantage of being operated by the same power as is used to run the works in which it is used and without the additional expense of extra boilers and attendants. The machine, it is stated, can be governed by the foot of the forger so perfectly as to cause it to crack a walnut or to strike a blow equal to a steam hammer of the same grade. The smallest size will deliver 500 strokes a minute, and is especially adapted to forging cutlery of all descriptions, bowls of spoons, small hardware, jewelry, etc. The medium size is designed for the use of a general forge shop, and will strike 250 blows a minute. The largest forms, it is believed, are as well adapted to all classes of work as the steam hammer, while they are free from the expense attending the use of the latter.



In the engraving is shown a side view of the machine, now on exhibition at the Chicago Exposition. The dies are made in the usual manner, and are keyed in position. The machine is driven by a friction pulley sliding on a splint in the shaft, the belted pulley being loose on the latter. The friction pulley is operated by a forked clutch worked by the right angled levers attached to the long foot lever, which is bent around the fore part of the hammer so as to be accessible on both sides and front of the apparatus. The shaft has a crank forged in the center and carries upon it a connection which extends to a leaved spring. On the other end of the spring is attached the hammer head, in which is keyed the top die. The spring works upon the bearings of a flat rocker shaft to which it is securely bolted.

The operations are as follows: The iron being heated and placed upon the die, the forger places his foot on the treadle to depress it, thus drawing down the arm that moves the clutch friction into the running loose pulley. The crank is thus revolved, drawing down the spring which carries up the hammer head, and producing by its velocity a vibration of the spring in which the blow given is in proportion to the velocity in which the crank revolves. It is aptly illustrated by cracking a whip. To forge a long rod or scythe, an aperture cast through the body of the upright part so as to allow the work to be passed lengthwise the forging dies is provided. The slightest pressure of the foot on the treadle is easily observable in the working of the machine, but the head never allows the dies to meet until there is velocity enough to produce the requisite vibration of the spring. The balance wheel, on the end of the crank shaft, acts in two capacities, the wheel having a balance placed within its rim to counteract the weight of hammer head, thus allowing the hammer to stop in any position in which the friction may leave it, thereby preventing the weight of the hammer head from always resting on the lower die when stopped; and the momentum of the wheel keeps the machine perfectly steady when running, and prevents, by the balance within its rim, that oscillating movement of frame which would be the result of the blow if not thus balanced.

There are, we learn, some twenty of these hammers now in operation in various parts of the country, doing all classes of forging, from the smallest forks upward.

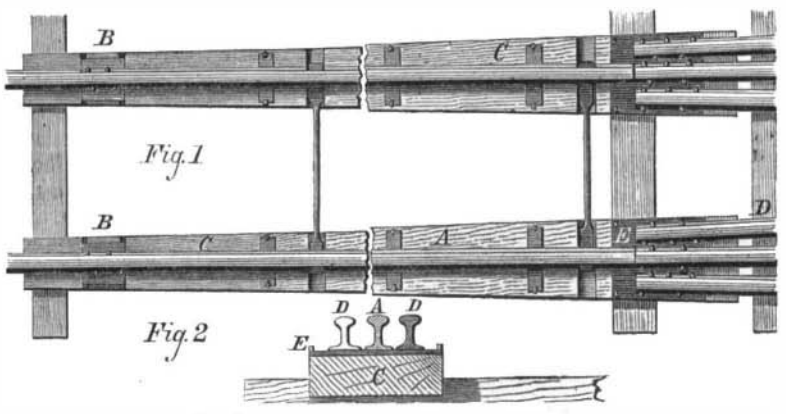
Patented by James Palmer, January 9, 1872, and reissued April 29, 1873. The sole manufacturers are Messrs. S. C., Forsaith & Co., Manchester, N. H., who are also builders of the Abbe bolt forging machine, recently described in our columns. Further particulars may be obtained by addressing them.

IMPROVED RAILROAD SWITCH.

Our illustration represents an invention which has for its object the construction of a switch connection which shall be free from the disadvantages resulting from the expansion and contraction of the switch rail at different temperatures, causing either a too close contact so as to prevent the working of the rail, or a too wide opening resulting in the battering of the rails and their consequent frequent replacement. In the ordinary form of switch, it sometimes happens that the rails open as much as three inches during the night; while if the fish plates are screwed up tight, the ends may close up entirely in the heat of the day.

A, is the switch rail, connnected rigidly, at the point B, to a long timber, C, placed underneath and passing through the cross ties which are cut for the purpose. The connection, at B, is such that the rail, A, pivots freely sidewise, while at its other end it communicates with the track rails, D, by means of a suitable lever connection moving on a bed plate, E, as a substitute for the heavy cast iron blocks. Bed plate E, rests on the crossties and gives a more elastic support to the switch rail, preventing thereby the anvil-like resistance and quick wear of the same. The track rails, D, also rest upon the bed plate and are rigidly attached thereto. The timber, C, passes below the plate under the middle rail and is firmly attached by bolts.

It will be observed that it is not so much the intention to overcome the expansion of the switch rail, A, from point, B, to bed plate, as such would only be about ¼ inch in some 18 feet; but the main object sought is to make a firm connection, between rails A and D, so that the adjoining rails of the track cannot crowd the former together. The inventor states, as the result of his experience, that unless some arrangement of this kind be used, the rails, when the fish plates are tightly screwed up, will run perhaps for a quarter of a mile, shoving up the switch joint (that being the weakest part) in preference to overcoming the friction of the



ADAMS' RAILROAD SWITCH.

fish plates and closing the usual ¼ inch spaces left to allow for expansion between every two rails. By the present system, it is claimed, through the means above described, the rails are obliged to fill up these spaces completely, as they cannot crowd or creep toward the switch, so that the latter remains unaffected and the relative distance between the ends of the rails always uniform. The device, we are informed, has been in use on the Central Pacific Railroad during the past summer, and, even when the thermometer ranged from 100° to 110°, worked with perfect success. The construction is such as to resist any strains to which may be subjected the plates under both throw and stationary rails, being bent at the end so as to cut down into the timber and thereby be prevented from any possibility of slipping.

Patented through the Scientific American Patent Agency, May 13, 1873. For further particulars regarding rights, etc., address the inventor, Mr. John R. Adams, Truckee, Nevada county, Cal.

Important Patent Litigation.

The loom improvements patented by William Webster pertain to the operation of the wires used in the manufacture of carpets and other pile fabrics. The practical result of the use of the Webster invention is to augment the production of the loom by more than 33 per cent, without increase of the power or other expenses. No sooner had the success of the improvements been practically demonstrated than various carpet and other factories sought to modify their looms so as to gain the same advantage. In this they are alleged to infringe the patents above alluded to, and an extensive series of litigations has been commenced on the part of the patentee. Testimony is now being taken, prior to argument in the United States Court.

Habits of the Baltimore Oyster.

In a conversation with a prominent oyster packer, says the *Baltimore American*, some curious and interesting features of the oyster trade were related. As is well known, the habits of this bivalve are an entire mystery; what it eats and how it lives are questions not yet understood. The spawn of the oyster floats around with the action of the waves and tide, and adheres to whatever it may come into contact with. Oysters taken from a rocky bed are of superior quality; those taken from a soft bottom are comparatively poor in quality. Thousands of "poor innocent" oysters die annually from resting on a soft bottom, a fact which should arouse the sympathies of all tender hearted people.

The weight of the oyster, as it gradually matures, sinks it beneath the surface; and as soon as it is covered with sediment or mud, it dies. Many people suppose that the oyster really eats, and kind hearted people, buying oysters in the shell, sometimes throw corn meal over them, thinking to feed them. The peculiar noise emanating from them has been supposed to be produced by feeding. All shellfish at times have their shells open, and when touched will instantly close them. The noise thus produced has been mistaken for mastication, when, in reality, it is from fright.

Most of the Baltimore dealers in raw oysters during the summer months transact their business at Fair Haven, Conn., whither large beds of Baltimore oysters have been transplanted. The beds are so arranged that, on the receding of the salt water tide, fresh water from a small stream covers the oysters; it is said that this fattens oysters better than any other method. Orders are received for the article in question during the summer months, and they are taken from the beds and shipped with the greatest possible dispatch, and many eat them with apparent relish, notwithstanding the warmth of the season. Altogether the oyster packing trade of Baltimore is an enormous one, and, in connection with fruit and vegetable packing business, employs a capital of about $25,000,000, a fact which sufficiently expresses the great importance of this interest to Baltimore.

Determination of the Heat of Combustion of Explosives.

M.M. Roux and Sarran communicate to *Les Mondes* the following description of the mode of determination and results obtained, in testing the heat disengaged by the combustion of various kinds of gunpowder. The deflagration was produced in cylindrical cast iron shells of 0·9 inch in thickness and of an interior capacity of from 16 to 17 cubic inches. These bombs were closed by a bronze screw plug through which passed an isolated wire, which conducted a current sufficient to heat a thinner wire within to redness and thus inflame the charge. They were placed in a copper vessel 4·5 feet in diameter, 5·1 feet in hight, and containing about 4 pounds of water. The temperature of the bath was determined by the end of a thermometer graduated to tenths of a degree, with reading to hundredths. The water was first brought to a temperature equal to that of the surrounding atmosphere, the explosion caused, and then the difference in warmth noted. The following results were obtained:

	Sulphur	Saltpetre	Charcoal	Units of heat per 2·2 lbs. of powder.	Weight of gas per 2·2 lbs.
Fine sporting powder	10·0	78	12·0	807·3	0·337
Cannon "	12·5	75	12·5	752·9	0·412
Musket "	10·5	74	15·5	730·8	0·414
Ordinary com. "	13.0	72	15·0	694·2	0·446
" blasting "	2·0	62	18·0	572·2	0·499

New Method of Preparing Caustic Soda.

The crude lye is evaporated in cast iron boilers. At a certain heat the cyanides contained in the pasty mass are decomposed, with escape of ammonia and deposition of carbon. When this point is reached, the heat is raised to redness, and the mass becomes more fluid. A sheet iron cover is then fitted upon the boiler, provided with an opening through which enters an iron pipe. This is plunged into the mass, and air is forced in. The graphite which separates rises to the surface and may be collected. The mass is tested from time to time to see if the sulphur is perfectly oxydized. When this is the case the blast is stopped, the mass allowed to become clear, and run off as usual.—*M. Helbig.*

POISONOUS UNDERSHIRTS.—J. N. writes to tell us of an instance of a man being blistered by wearing an undershirt dyed with cochineal. He advised the sufferer to bathe the part in a solution of soap and soda to neutralize the tin which had been absorbed from the dye, and put the shirt through the same treatment. He attributes the evil to the carelessness of manufacturers who send out goods without rinsing or washing them.