

New Inventions.

Boardman's Coal Burning Locomotive.

This locomotive, on which we made a trip and gave an account of its performance on page 394, last Volume, has ever since been employed by the New Jersey Railroad Transportation Co., and a recent report of its performance has been presented by Mr. Van Rensselaer, an old Superintendent of the road. He has tested its capacity in every possible way, states that it has thus far proved completely successful under the most trying circumstances, and a great improvement over the wood-burning engines, both in convenience and economy. Assuming the cost of the coal to be \$6 per ton, (Cumberland coal being used,) he estimates the average expense of running it at about ten cents per mile, or a saving of from 35 to 50 per cent. in fuel, over the wood-burning engines—the running speed being at the rate of nearly 45 miles an hour. It runs from Jersey City to New Brunswick, (31 1-2 miles,) in one hour and five to ten minutes, including stops at the stations, &c. The cost of running the most economical wood engine on the same road, Mr. Van Rensselaer estimates to be a fraction less than 14 cents per mile, which he considers below the average cost.

Hot Bleaching Liquor.

We have received a letter from a correspondent, in which he states that some bleaching liquor, heated by mistake to 120°, to bleach linen, produced no bleaching effect whatever, and he wishes to know the reason. The agent which produces the bleaching effect in the common liquor, is chlorine, which is absorbed by water from chloride of lime, when mixed with it, and the clear solution is the common bleaching liquor employed in paper mills, calico print-works and bleach-works. It is a volatile gas, and is therefore driven off easily with heat. All the chlorine was driven off in our correspondent's vats by the heat, consequently we have a solution of the question, "why his liquor did not bleach his linen?" Chlorine liquor will bleach more rapidly when hot than cold, but the only way to use it properly, is to pour in cold strong bleaching liquor into hot water, then handle the goods rapidly in this—for the heat long continued will drive off all the chlorine.

Improvement in Sewing Machines.

The accompanying engraving illustrate the cheap Sewing Machine to which we alluded in the last number of the SCIENTIFIC AMERICAN, at the end of its patent claim, page 98.

Figure 1 is a perspective view, and fig. 2 is a plan view, showing the under side. Similar letters refer to like parts.

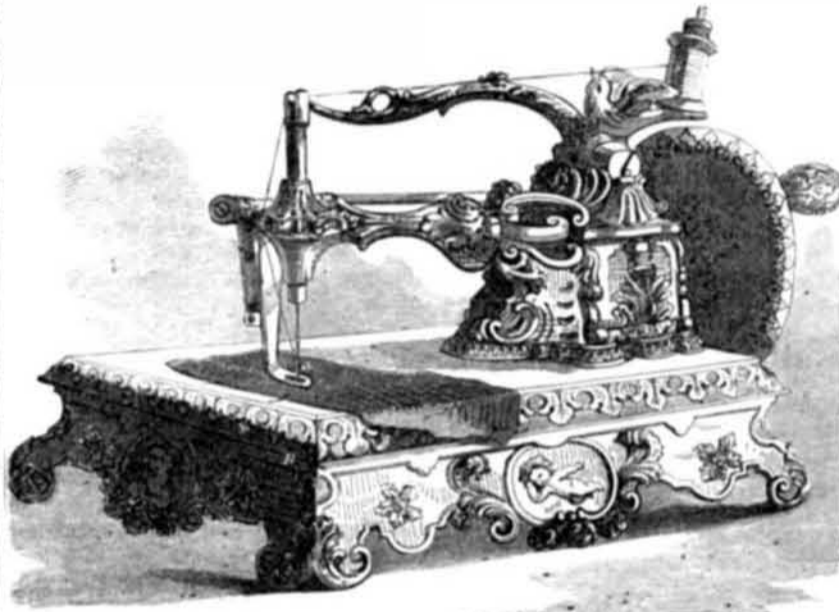
The working parts are mounted on and secured in a neat cast metal tablet, B. The spool, S, supplies thread passing through a guide eye in the needle arm, thence down through the eye of needle *a*, near its point, from whence it is carried through the cloth and made to operate in a peculiar manner to form a twisted loop stitch. The working parts are shown in fig. 2. A is a cam cylinder secured on the spindle of the driving pulley, or handle, and secured in the hollow standard on the tablet; *g* is a cam groove in it to operate the needle arm by a pin on the arm inside, inserted in the groove; it also operates the cloth bar or feeder, by the pin, C, in the groove; this pin is attached to a rocking arm, and gives the cloth feeder a reciprocating motion in unison with the stitches of the needle. The under side of this feeder is serrated. The pin, C, can be adjusted to feed the cloth for fine or coarse stitches. The cam cylinder causes two stitches to be made at each revolution. On the end of the cylinder, A, are two cam projections, D, which vibrate arm E, projecting downwards, and which is connected by an axis pin, F, to a horizontal walking-beam arm, G, secured in the bottom of the tablet by a pin, O, passing through a small strip, P. A coiled spring, *q*, is attached to a pin in arm G. The arm, G, operates the looping hook, M, which causes the chain stitch to be made; it is therefore secured to a small tube, H, which has a spiral groove, *h*, in it. The hook, M, is secured to a small pis-

ton, I, in the tube; there is coiled spring on the shank of the hook piston to throw it back when relieved of pressure. There is also a small pin secured on the hook piston, which pin is inserted in the spiral groove, *h*. J is a projecting guide plate for the needle, *a*; it has

a ledge with a small vertical groove in it for the needle. K is a projection on the bottom—inside of the tablet.

The hook, M, is shown hooked into the loop of the thread. As the cam cylinder, A, is revolved, and the end of arm G, carrying the

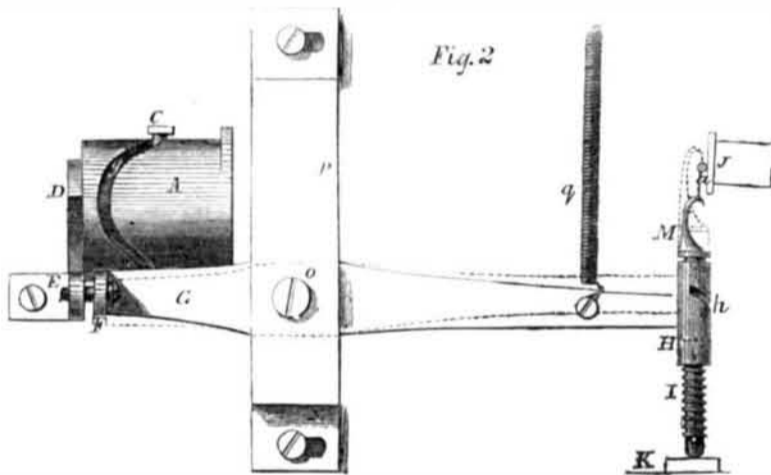
WATSON'S FAMILY SEWING MACHINE.



hook tube, is moved towards the projection, K, the hook, M, carries the thread back with it in the form of a loop, and when the shank I, is pressed against the projection, K, the pin of the hook in tube H, is carried in groove, *h*, which thus gives the hook a twist, and with it the loop of the thread. When the arm, G, ceases to be pressed against K, by its cam having passed over its upper end, E, the hook, M, by the coiled spring, is drawn back into its former position, allowing the thread to pass off its point, to be carried up by the

needle arm, and drawn tight in the stitch. All the motions are performed conjointly with one another, that of the needle, the cloth feeder, and hook, M, to produce a twisted chain stitch with a single thread. The parts of this machine are few in number, and are arranged with great simplicity.

The proprietors of the patent state that one of their objects is to furnish machines of this character—8 inches by 5—for families, at a retail price of \$10. A sewing machine operating correctly, and not liable to get out of



order, furnished for this sum, must be a boon to the public. This machine operates much better than some elaborately constructed and far more expensive single thread machines we have examined. Due notice will be given in

the SCIENTIFIC AMERICAN when machines are to be retailed in this city.

For further information address (by letter only) Goodell & Prall, sole agents for Watson & Wooster, No. 1 Cortlandt street, New York.

Improvement in Locomotives.

J. R. Whitgrave, of Rugely, England, has recently secured a patent for peculiar improvements in locomotives. He places the steam cylinders midway between two pairs of driving wheels, which are so disposed as to bear nearly the whole weight of the engine, and a third pair of wheels are added, as leading or traveling wheels to complete the six required for the safety of the engine; another pair of leading wheels may also be added. The cylinders are placed horizontally, and are fitted with the ordinary valves and gearing, and are worked in the usual way, but instead of having the piston passing out at one end of the cylinder only, it is carried through both ends of it, which are fitted with stuffing boxes. The piston is thus prevented from causing undue friction on the under side, and also from wearing untrue.

Connecting rods are attached to both ends of the piston rod of one cylinder, the one connecting rod communicating with one of the cranks on the leading driving wheel axle, and the other with one crank of the rear driving

wheel axle; both of these cranks are acted on simultaneously by one cylinder and piston, and caused to revolve in the same direction. The opposite cylinder is similarly fitted and furnished. The connecting rods of the one cylinder communicate with cranks on the leading and rear driving axles, which cranks are placed at right angles to the other cranks on their respective shafts, in order that both engines may not be at the same time on the dead point. By thus arranging the cylinders and pistons to act in opposite directions at the same time, the tendency to oscillation is avoided, and collectively, a greater amount of power exerted on the driving wheel axles, and the revolving force of one wheel being communicated to the other through the piston rod, which wheels have an increased hold or bite on the rail from the whole weight being brought to bear on them, or nearly so, without risk to the running of the engine.

Another of the improvements in locomotive engines refers to the method of connecting the tender thereto, and consists in forming the end of the tender convex, and presenting

the section of a cylinder or circle with a vertical axis. The end of the engine is concave to suit the curved end of the tender. The engine and tender are connected by a draw bar suitably attached to the engine, and jointed at the point or center from which the curve of the junction is struck, from which joint to the rear draw hook the draw bar is continued, and slides in suitable bearings. The tender is held close up to the engine while running. The joint pin of the draw bar may or may not be fixed to the tender. Thus the engine and tender are made as one body, the one steadying the other, and preventing any side motion, and giving a clear floor and secure footing to the engineer.

Improved Tools.

We have examined a number of specimens of tools made by George Parr, Buffalo, N. Y., consisting of shoemakers' and saddlers' awls, tinsmiths' punches, cold chisels, oyster knives, screw-drivers, Yankee screw-drivers with hollow handles, and a set of tools within; scratch awls, pinking irons, etc. They exhibit an excellence of finish and superiority of quality highly creditable to the maker. It is but a short time since all articles of this kind were imported. But now they are extensively manufactured here. Mr. Parr employs about fifty men besides a variety of the most improved labor-saving machinery, for the production of tools of the above character. His heavy forging is done by one of Hughes' steam trip-hammers; and for turning the handles he uses Blanchard's celebrated lathe. Mr. Parr's establishment is a model one in its arrangements, and the tools having his stamp are unsurpassed.

Use of the Syphon at the Mines.

In the new diggings discovered on the San Andreas Gulch is a shaft sunk sixty-seven feet, which is drained by a syphon. The lead pipe which conducts the water extends several hundred feet down to the gulch. The only difficulty is in regulating the syphon, so as to exhaust the water no faster than the supply comes into the shaft. This difficulty once obviated, and the syphon will be introduced in numerous mining claims on our hill-sides, where the ledge has never yet been struck, and the labor consequently lost. Hundreds of rich mining shafts, now abandoned on account of the water, may yet be successfully worked by aid of the syphon. In every instance where a shaft has been sunk to the ledge in all the new claims just below Jenk's ranch, rich prospects have rewarded the enterprise. Parties are at work sinking shafts in Jenk's field.—[San Andreas (Cal.) Independent.

[The above is certainly incorrect. A syphon will not drain a mine over thirty feet deep. Its action is due to the pressure of the atmosphere, which can support a column of water only 30 feet high at the level of the sea. Miners of California should not be deceived regarding the use of the syphon in draining mines; it never can be of much benefit to them for this purpose; they must trust to the lifting pump as the most sure and certain means for keeping their mines free from water.

The sum of \$105,000 will be applied this year for agricultural purposes by the Commissioner of Patents. This is the amount appropriated at the last session of Congress.

Aluminum is now manufactured on a large scale at Rouen, France.

SPLENDID PRIZES.—PAID IN CASH.

The Proprietors of the SCIENTIFIC AMERICAN will pay, in Cash, the following splendid Prizes for the largest Lists of Subscribers sent in between the present time and the first of January, 1857, to wit:

For the largest List,	\$200
For the 2nd largest List,	175
For the 3rd largest List,	150
For the 4th largest List,	125
For the 5th largest List,	100
For the 6th largest List,	75
For the 7th largest List,	50
For the 8th largest List,	40
For the 9th largest List,	30
For the 10th largest List,	25
For the 11th largest List,	20
For the 12th largest List,	10

Names can be sent in at different times and from different Post Offices. The cash will be paid to the order of the successful competitor, immediately after the 1st of January, 1857.

See Prospectus on last page.