

**IMPROVED MIDLINGS SEPARATOR**

We illustrate herewith a new and simple midlings separator, in which descending streams of moldings are freed from impurities by the action of ascending air blasts.

In the upper part of a vertical draft box, A, are placed a number of inclined slats, B, which break and distribute the flow of midlings and the current of air. Said slats are located at the entrance of a horizontal box, C, along which the particles carried over from the vertical box are transported to the hopper, D, into which the final separation is made by a lighter current up the spout, E. The midlings are fed into box, A, from the hopper, shown above, passing upon a vibratory shoe, F, and their supply being regulated by the slides, G. The bran is discharged through the fan, H.

Below the apparatus thus described is arranged a duplicate set of mechanism in which the midlings falling from hopper, D, are again treated in the same manner by air currents set in motion by the fan, I.

The inventor informs us that he has practically tested the machine with excellent results. One has been in operation in the Oneonta Mills, Oneonta, N. Y., since September last, and has been examined and improved by prominent millers of the vicinity.

Patented March 14, 1876, through the Scientific American Patent Agency. For further particulars address the inventor, Mr. Morris N. Elwell, Oneonta, Otsego county, N. Y.

**Artificial Grape Sugar.**

The manufacture of glucose or artificial grape sugar from starch has become an important branch of chemical industry abroad, although in this country it is little developed, perhaps because potatoes are not so productive a crop here as there; and our starch is mostly made from corn, and hence is too expensive for profitable conversion into sugar, since any excess of corn is easily convertible into whisky.

Fr. Anthon has analyzed three specimens of grape sugar sirup, made in Bohemia, France, and Germany, respectively, with the following results:

	Bohemian.	French.	German.
Dextrose or grape sugar	48.3	30.1	50.0
Levulose or fruitsugar	6.2	5.0	—
Dextrin	25.5	48.0	—
Water	20.0	16.9	20.0

In the German sirup there was no dextrin, but 30 per cent of some substance soluble in alcohol, and not yet nearer determined.

**IMPROVED STEAM RIVETER.**

The annexed engraving represents a new machine for riveting together the angle bars, plates, and reverse bars that compose the frames, crossfloors, and keelsons of an iron ship. The parts are first bolted together temporarily, precisely as prepared for hand riveting, and are carried up to the machine by a large and suitably located crane. The rivets are heated in quantities, and are driven about as fast as a boy can put them in the holes prepared for their reception. The driving is done by direct steam pressure upon a large piston which moves vertically. Steam is admitted by the operator pressing the foot lever shown. When the pressure on the lever is removed, the weight on its end descends, and so causes the exhaust to open.

The machine, besides being applicable to the purposes of iron shipbuilding, is especially well adapted for the riveting together of the parts of iron railway bridges or of any work made up of angle, channel, or I beams, or of flat plates associated with them. The capacity of the apparatus, we are informed, is equal to that of ten gangs of hand riveters, and it requires the attention of but one skilled workman, three laborers, and one boy. The riveting, when done, is better than handwork, for the reason that the heavy direct pressure applied forces the heated rivet into every part of the rivet hole, filling it solidly, and this without granulating the iron, as is often the case with hand-driven rivets.

For further information address the manufacturers, Messrs. Pusey, Jones & Co., Wilmington, Del.

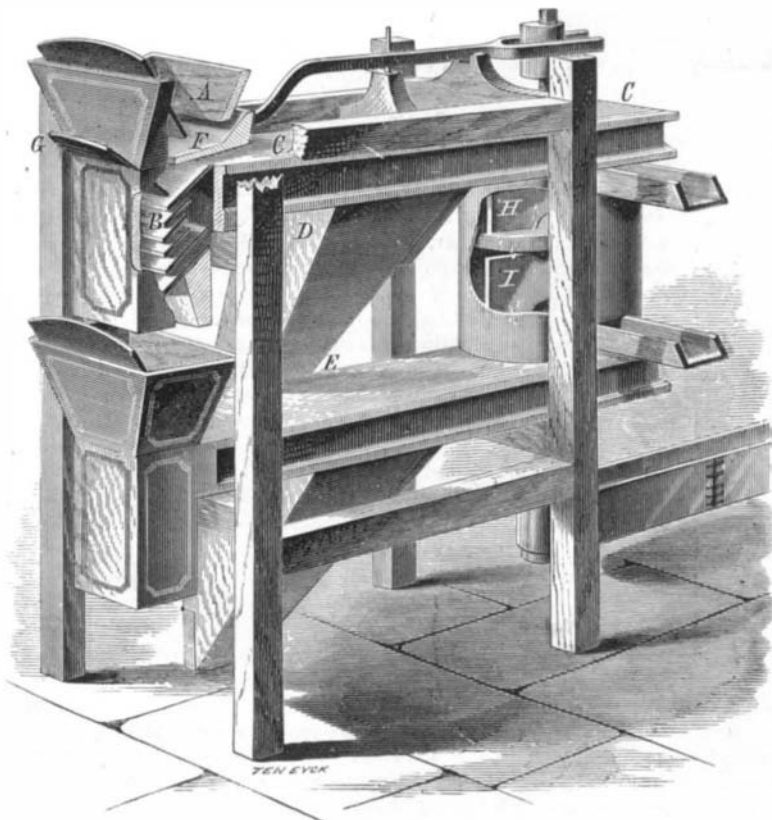
**Peter Cooper and the Locomotive.**

Anything concerning the venerable Peter Cooper and the enterprises he has been engaged in is always interesting. The following account of the first locomotive and the reasons for building it, we find, says the *Iron Age*, in one of our exchanges:

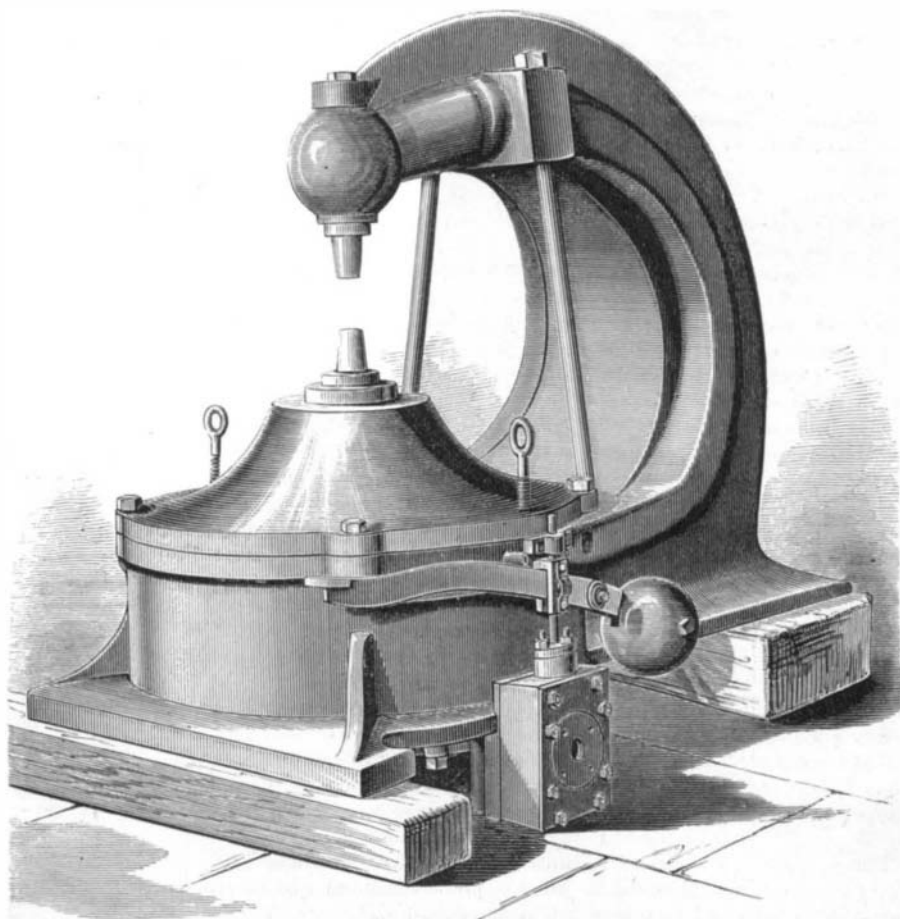
"Mr. Cooper had bought, as a speculation, the entire magnificent tract in Baltimore now owned by the Canton Company. Baltimore was then a city of 75,000 people, rich and prosperous, and had entered upon the railroad era. On July 4, 1828, the corner stone of the Baltimore and Ohio road was laid with imposing ceremonies by Charles Carroll, of Carroll-

ton. It was pushed energetically—a little too much so—for when thirteen miles had been finished it was found that, in turning the rocks to save cutting, such short curves had been introduced that the then experts declared the line utterly useless. It could not be used by steam. Five per cent had been paid in, and shares had been sold at 17, such was the zeal and confidence of the people. But the chill was immense, and everything stopped. Mr. Cooper, then 38 years of age, saw new disasters to himself in the depreciation of his tract should the road fail. He proposed to the directors to construct an engine to be available on their line. They were

"We have heard the account substantially in the same form from Mr. Cooper himself. Several years since he was engaged in the construction of a steam yacht on the East river; and upon one occasion, when visiting it, we met him and had a long conversation on the subject of his early inventions and the little locomotive mentioned. Mr. Cooper went to and from the shipyard in a chaise drawn by one horse, and invited us to return with him. On the ride home he gave us some particulars of the locomotive. The draft was obtained by means of a small fan, and was sufficiently powerful to carry shavings from the firebox through the tubes and up through the smoke stack. The boiler itself was of the vertical tubular pattern. The engine was attached to a car in the usual manner. The importance of the success of the undertaking was very great to Mr. Cooper, as he, in partnership with two others, had bought a large tract of land near the line of the road. He found himself burdened with the whole purchase, as the others were unable to furnish their share of the money; and in case of a fall in the value of the property, his loss would have been very heavy."

**ELWELL'S MIDLINGS SEPARATOR.**

willing, but incredulous. He brought down from his glue factory in New York an engine with a 3½ inch cylinder and 14 inch stroke, procured wheels and other appliances from the railroad company, and presently rolled out on the track the first American railway engine. The trial trip was to take place the next day. That night a thief stole all the copper and brass from the infant machine, and this caused some further delay. The trial trip was run, Mr. Cooper himself act-

**PUSEY & CO'S STEAM RIVETING MACHINE.**

ing as engineer; and when the little baby locomotive threatened to lose too much steam, he held down the safety valve with his own hands. The run was made with 30 passengers, 13 miles in 1 hour, and Baltimore was happy. Compare the little engine of 47 years ago with the ponderous machines of to-day! and yet they follow on the pathway the little engine opened."

**Useful Recipes for the Shop, the Household, and the Farm.**

A new process for hardening zinc consists in pouring into the metal, while in a state of fusion, a proportion of sal ammonia varying from 3¼ to 7 ozs. per 22 lbs. according to the degree of hardness desired. Metal thus prepared can be worked with the file and the lathe, and may, in many cases, serve as a substitute for bronze.

A new mode of waterproofing woolen materials consists in boiling 4½ ozs. white soap in 2½ gallons water. Separately dissolve 5½ ozs. alum in 2½ gallons water. Heat these solutions to 190° Fah. and pass the fabric through the soap bath and afterwards through the alum solution. Dry in the open air.

To detect grape and cane sugar in glycerin. Mix 5 drops of glycerin with 100 to 120 drops of water, 1 drop of nitric acid, and half a grain molybdate of ammonia, and heat. If sugar is present, the mixture turns to an intensely blue color.

**Celebrated Automata.**

The Philadelphia *Ledger* states that a Walnut street watchmaker, of that city, has recently had in his charge for repairs the famous automaton trumpeter made by M. Maelzel, which was exhibited in Philadelphia many years ago. The first public mention of the trumpeter was in the *Journal des Modes*, for 1809, at which time it was exhibited at Vienna, and attracted much attention. About 1830 M. Maelzel came to this country, bringing with him the trumpeter and also the chess player, another remarkable piece of mechanism, but which was not an automaton in the correct sense of the word, as its actions were controlled by a skillful chess player who was concealed within the figure.

The trumpeter was first exhibited on Fifth street, below Adelphi, in a building which stood where the Messrs. Tatham's building now is. Here Mr. Maelzel had a diorama of the burning of Moscow, which was a favorite entertainment. The universally known Signor Blitz, then a young performer, also appeared, and the trumpeter was exhibited by M. Maelzel, who would wheel it out on the floor, and touch a spring on the shoulder, which started the mechanism. He would then seat himself at the piano and play the accompaniments and variations, while the automaton played army calls, marches, etc.

After remaining on Fifth street for some time, M. Maelzel took his exhibition on a traveling tour, returning to Philadelphia Maelzel afterwards went to Havana, taking Signor Blitz and his automata with him; here he was unfortunate, and, becoming dispirited and his health failing, he started for home, but died on shipboard, and his effects were sold to pay his passage.

A number of gentlemen, among whom were Dr. Mitchell, Constant Guillou, and Robert Cornelius, purchased the chess player, which was placed on exhibition in the Chinese Museum, at Ninth and Sansom streets, and was lost in the fire which destroyed that building. The trumpeter was placed in the old Masonic Temple, and passed into the possession of Mr. Scherer, a music dealer on Chestnut street, and is now owned by his heirs. The machinery of the trumpeter is contained within the trunk of the figure and is worked by a steel spring which drives a barrel on which are pegs like those in a musical box. A bellows just below the neck of the figure furnishes the wind, and a valve with a steel tongue, which is lengthened or shortened by means of levers working on the barrel, makes the different notes.

RESIN 1 part and beeswax 1 part, softened with tallow, make a good grafting wax.