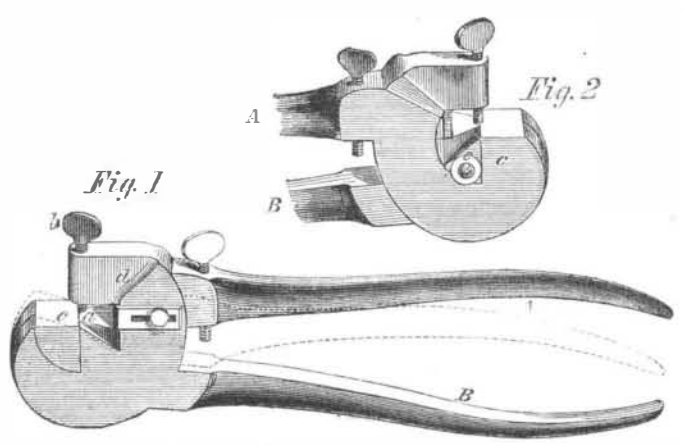
IMPROVED SAW SET.

The annexed cut illustrates an implement for setting the teeth of saws, invented by Lebbeus Brooks, (deceased) and patented by Olive Ann Brooks, administratrix of his estate. The principal feature of the invention is the connection of the jaws without the use of a fulcrum pin.

The saw is placed between the jaw, *c*, and the end of the screw, *b*, which passes through the jaw, *d*, with the end of the teeth against the adjustable guide, *a*. The jaw, *c*, being rigidly attached to the upper handle, A, and the jaw, *d*, to the lower handle, B, by pressing these handles together the saw is rolled upward and the tooth bent. The projections in one jaw correspond to recesses in the other, and the boundaries of these are curves about a common center, permitting the motions of opening and closing the jaws. The two parts are fastened together by means of a screw and washer, *c*, the washer lapping over the edge of the jaw, *c*, and the screw entering the jaw, *d*.



The patent for this invention was issued March 29, 1859, and persons desiring further information in relation to it will please address Messrs. Clark & Wilson, 81 Beekman-street, this city, or the Great Falls Saw Set Company, Great Falls, N. Y.

CLEANING STEAM BOILERS.

MESSRS. EDITORS:—Having been a constant reader of the SCIENTIFIC AMERICAN, I have noticed several articles relative to the incrustation of boilers and the method for preventing or removing the same. Being an engineer myself I, of course, have had to contend with the same difficulty, and have used a number of articles, such as potatoes, potash and rye, but have as yet found nothing so beneficial as common molasses. In using it I have taken some convenient time when I could blow out a few hours after having raised steam, and previous to admitting water to the boiler, I would send in one of the firemen with a quantity of the article and a common swab made of rags, with which he would thoroughly coat the flues and sides of the boiler with the molasses. Afterwards I would raise steam and run from six to eight hours, then blow down, and, besides the scale that I would find already detached from the boiler, I could, with a common pick, remove that which had before resisted the hardest blow. In a boiler 30 feet long and 42 inches diameter, I have, in one trial, removed upwards of half a bushel of scale. J. L. L.

Dubuque, Iowa, March 7, 1860.

AN IMPROVEMENT ON THE CALORIC ENGINE.—Mr. Henry M. Paine, of Worcester, Mass., somewhat famous a few years ago for water-gas experiments, now claims (so says an exchange) to have perfected an engine, to be operated by heated air, which puts Ericsson's affair entirely in the shade—as the same power can be obtained, he says, with one-seventh the quantity of fuel. His improvement is represented to be based upon the asserted fact that "air which has been impregnated with a certain amount of moisture in the shape of vapor, will readily expand by the application of heat, to seven times the bulk which the same volume of dry or common air attains with the same degree of temperature."

Oh Mr. Paine! Mr. Paine! why will you keep astonishing the world with your discoveries, and then disappoint everybody by letting them end in mere *gas*.

WATER WHEELS AND PRINTING PRESSES.— The Lynchburgh *Virginian* is printed on an Adams press which is driven by a small water wheel, under a high head, with only an inch discharge pipe. The water is conveyed from an elevated reservoir by a pipe, and it passes out into the sewer of the street, after having operated the wheel. This is a most simple mode of driving small presses in places where a considerable head of water may be obtained. In Newcastle, England, and in Stirling, Scotland, two weekly newspapers are printed on presses driven by small water engines, but a small turbine wheel is about the best form of a water motor that can be used.

CUTTING FILES BY MACHINERY.

MESSRS. EDITORS:—Being a constant reader of your valuable paper, I recently read (in your issue of the 11th ult.) a notice of files made at Ballard Vale, Mass. Presuming you wish to know of all new and valuable improvements, I send the following brief account of the method and progress of making files by the Whipple File Company, at the above place:—

The company has been in existence about two years, with Hon. Alfred Kittredge, of Haverhill, as president; and is now running six machines (or two "sets") for the flat file, and one for cutting round files. These files have been in use in this vicinity for more than a year, and have given entire satisfaction—*vide* the testimonials in Boston papers. In fact, the "proof of all proofs" is in their favor, as they sell as fast as they can be made, and at the same price that the English (or hand-cut) files are sold. By this manner of cutting files (which is by a rotary cutter attached to a vibrating bar or slide) the difficulties of all former trials are obviated. The file is set or fixed by its tang into a socket; and it is fed up by means of gears and ratchet. By this method of holding the file, the old way of using lead is done away with; as, by this machine, no chisel or blow is used to make the tooth. These cutters are three or four inches in diameter, and three-eighths of an inch thick; and experience, so far, has led to the conclusion that they will do their work for one week without being sharpened; a few moments only being necessary to change them. By using these cutters, the trouble of keeping the edge of a chisel in the proper order to catch the steel for the succeeding tooth is saved. This peculiar edge of the chisel used by hand-workmen is a necessary point to them, and is the reason of their so often needing to be honed or sharpened. By using the rotary cutter, it is easily seen that the force necessary to cut the tooth is used only as the cutter travels across the blank, as it acts like rotary shears; while, by using a chisel of the width of the blank, a powerful blow is necessary to displace a sufficient amount of steel to form the tooth, thereby deranging or altering the position of the blank at each blow. This shows it to be almost impossible to adapt machinery to hold a blank in its place while being cut; and, furthermore, the blow must be adapted to the shape of the blank. The Whipple File Company gage the depth of the tooth from the face being cut, independently of the width or thickness of the blank. A "set" of machines (consisting of three) turns out or finishes two dozen in 30 minutes. By one man's labor, it is intended to produce from 25 to 30 dozen of 12-inch "bastard files" per diem of 10 hours; one man being employed to each set of machines, each machine cutting eight files; the three machines consequently cutting, at the same time, 24 files. The company are introducing improvements in all branches of the file business; and, by judicious management thus far, they give promise of future success.

M. D. W.

Boston, Mass., March 10, 1860.

EXPERIMENTS IN CAST IRON.

A series of very valuable experiments have been carried on, under the management of Col. Eardley Wilmot, superintendent of the royal iron factories at Woolwich, England, with a view to determine the most suitable variety of cast iron for making cannon; and the results of these experiments have been lately printed in the form of a Parliamentary report. Information regarding the several brands of iron experimented with would be of little interest to our readers, but there is other information in it interesting to all who work in cast iron; and the substance of this we give as follows:—The general mean tensile strength of 850 specimens of cast iron was 23,257 lbs. on the inch: the transverse strength of 564 specimens was 7,102; while the crushing strength of 273 specimens was 91,061 lbs., and the torsion but 6,056.

It was found during these experiments that when the specific gravity of cast iron was 7.3, and upwards it was too hard, and did not possess sufficient elasticity for casting cannon. A marked superiority was the result in bars cast horizontally over those cast vertically. Bars which were cooled quickly were also much stronger than others cooled slowly.

It was also found that by repeated re-melting of the cast iron its quality was greatly improved. This effect, however, was not so marked when large masses of several tuns were operated upon at once. It is believed that by re-melting (although such impurities as phosphorus, sulphur and silica may not be expelled) some of the graphite in the iron is converted into combined carbon, which enables the contraction and crystallization of the metal to be more complete. But if the melted iron is allowed to cool very slowly, the carbon is re-converted into graphite, and the iron becomes soft. Repeated melting, then quick cooling, and horizontal casting, improve vastly cannon and all articles made of cast iron.

EXPERIENCE IN TEMPERING MILL PICKS.

MESSRS. EDITORS:—I noticed on page 126 of the present volume of the SCIENTIFIC AMERICAN, in answer to a correspondent, a few remarks on tempering picks. Allow me to add my experience to your knowledge. In the first place, a good charcoal fire is necessary, next good steel, then a good light hammer, a good smooth-faced anvil, and a man with a good eye and judgment. A pick must never be upset or hammered endwise, nor raised above a red heat; it must be worked with care, and the last hammering given on the flat sides. When ready for hardening it must be heated in the blaze of a charcoal fire until red hot, then plunged into cold rain water until it is nearly cold. If it is kept in too long the corners will fly off; and if the water is not cold enough add ice, but no salts of any kind. With good steel and proper working, I have found no trouble to get picks hard enough with soft water, and those have always been more tough and have stood more work than any other. F. F. S.

Momence, Ill., March 5, 1850.

OUR SHIPPING.

The total tunnage of our commercial navy amounts to 5,145,037, which is less by 97,291 than what it was in 1858. This is owing to the loss of a number of vessels and some which were condemned, together with 30,850 tnns sold to foreigners. During last year there were built—Ships and barks, 89; brigs, 28; schooners, 297; sloops and smaller craft, 284; steamers, 172: total number, 870. The depressed condition of the shipping interest has operated to decrease the demand for new ships, and the number built during the year has been less than for any former year since 1844. In the foreign trade there are 2,507,401 tuns of shipping engaged; in our coasting trade, 2,439,320 tuns; in cod and mackerel fishery, 147,546 tuns. We have 768,752 tuns of steam shipping. At present our ship-building business is very dull. An eminent ship-builder has expressed the opinion (to us) that if we wish to retain our foreign trade, we must go in for the construction of iron screw steamships. Our coasting trade has wonderfully increased of late years, owing principally to the acquisition of California. We should also seek to cultivate a more extended trade than we now possess with the South American ports.

THE PENNSYLVANIA OIL SPRINGS.—The continued yield of these springs and veins is creating much excitement in their vicinity and elsewhere, being calculated, as they are, to render that region of our country one of the richest in the Union. One gentleman at Union, Pa. (a Mr. Hall) recently commenced boring, and at the depth of 58 feet struck a vein, which is yielding him 12 barrels of oil per day. Others, from a greater depth, are securing 30 barrels per diem. It now becomes a question as to what the effect of these discoveries will be upon the whale fishery.—*Evening Post.*