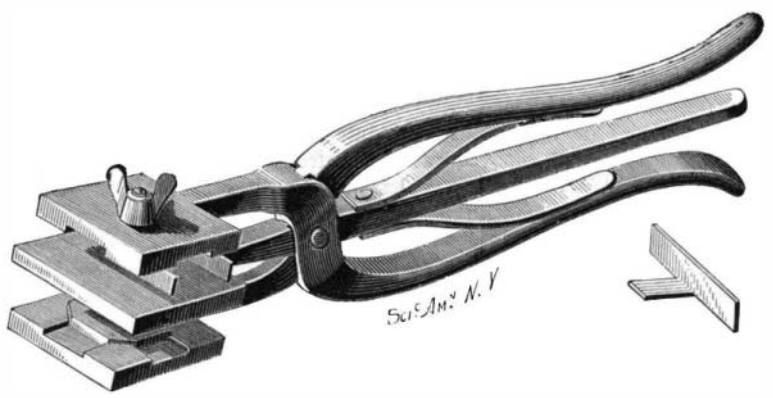
American Trade with France.

Consul Bridgeland, at Havre, reports a large increase in the demand for American grain and provisions in France. The general substitution of corn for oats in feeding tramway and cab horses has increased the demand for this grain to double what it was a year ago. The demand for wheat has also increased. Our principal exports of provisions to France are bacon, pork, lard, tallow, and beef. The shipments of bacon have doubled, and of lard have trebled, those for the corresponding period of last year. The shipment of fresh beef is also an important item, nearly half a million pounds having been received at Havre between November and May.

IMPROVED SHEARS FOR MARKING STOCK.

The accompanying engraving represents an improved instrument for marking the ears of cattle, so as to enable them to be identified. It consists of three plates or jaws, provided with three handles, and combined as shown. On the faces of the outer jaws are grooves to receive blocks, by which the cutters, one of which is shown separately at A, are held in place. The holders are secured in place by bolts provided with hand nuts. The cutters may be made straight or curved, so as to make different shaped marks, or the latter may be varied by different adjustments of the cutters in the holders. Patented April 30, 1878, by Mr. William Wright, of Warrior Station, Jefferson county, Ala.



SHEARS FOR MARKING STOCK.

New Telephone Diaphragm.

M. Louis Olivier has lately devised a form of telephone which differs from the ordinary Bell apparatus chiefly in the shape of its diaphragm. This, instead of being a merely circular plate, is concave, of unequal thickness and elliptical in shape. Its general plane is also inclined to the axis of the instrument. It is attached by the edges, and a thread of silk is fastened to it at its thickest part. The inventor states that the idea is to imitate the construction of the drum of the human ear more perfectly, and that the timbre of the voice is preserved by the improved diaphragm with great accuracy.

FILE SHARPENING BY THE SAND BLAST.

It is not possible to cut file teeth to perfect chisel shape by ordinary cutting processes. There is always a burr thrown up by the entry of the cutting tool, which gives the teeth a backward curve, as shown in section at A, Fig. 2. It will readily be understood how, in course of use, this burr breaks off, taking with it a portion of the edge of the tooth and leaving the latter rough and jagged, while the detached portions frequently clog the grooves, causing the file to scratch and pin. The remedy for dull files is recutting, but this costs nearly as much as it does to replace the tool with a new one, the metal is greatly reduced in grinding off the old teeth (this is especially the case with rasps), and the temper of the tool is often impaired, or warping or cracking is caused. As a matter of practical fact, consequently, it may be said that dull files cannot be sharpened, to any advantage, by recutting processes.

Latterly, however, an ingenious application of the sand blast has been made to this purpose, and, we are informed, and as appears from samples of work exhibited to us, with remarkable success. The sand blast, as all are aware, consists of a stream of sand driven by steam or compressed air with sufficient force against any hard resisting material to abrade the latter. The adaptations are numerous and valuable, and it may be said to have revolutionized the art of glass engraving. Its employment for file sharpening, and not only to this but to the sharpening of all edge tools, even to razors, is entirely novel, and we are inclined to think it of more than ordinary importance. A moment's consideration will show that there is really no difference between grinding metal with sand compacted in the solid form of the grindstone or with the same material in the finely pulverized condition, impelled by air or steam blast; but it will further be seen that the sand blast has capabilities which no grindstone or grinding process can in any particular equal.

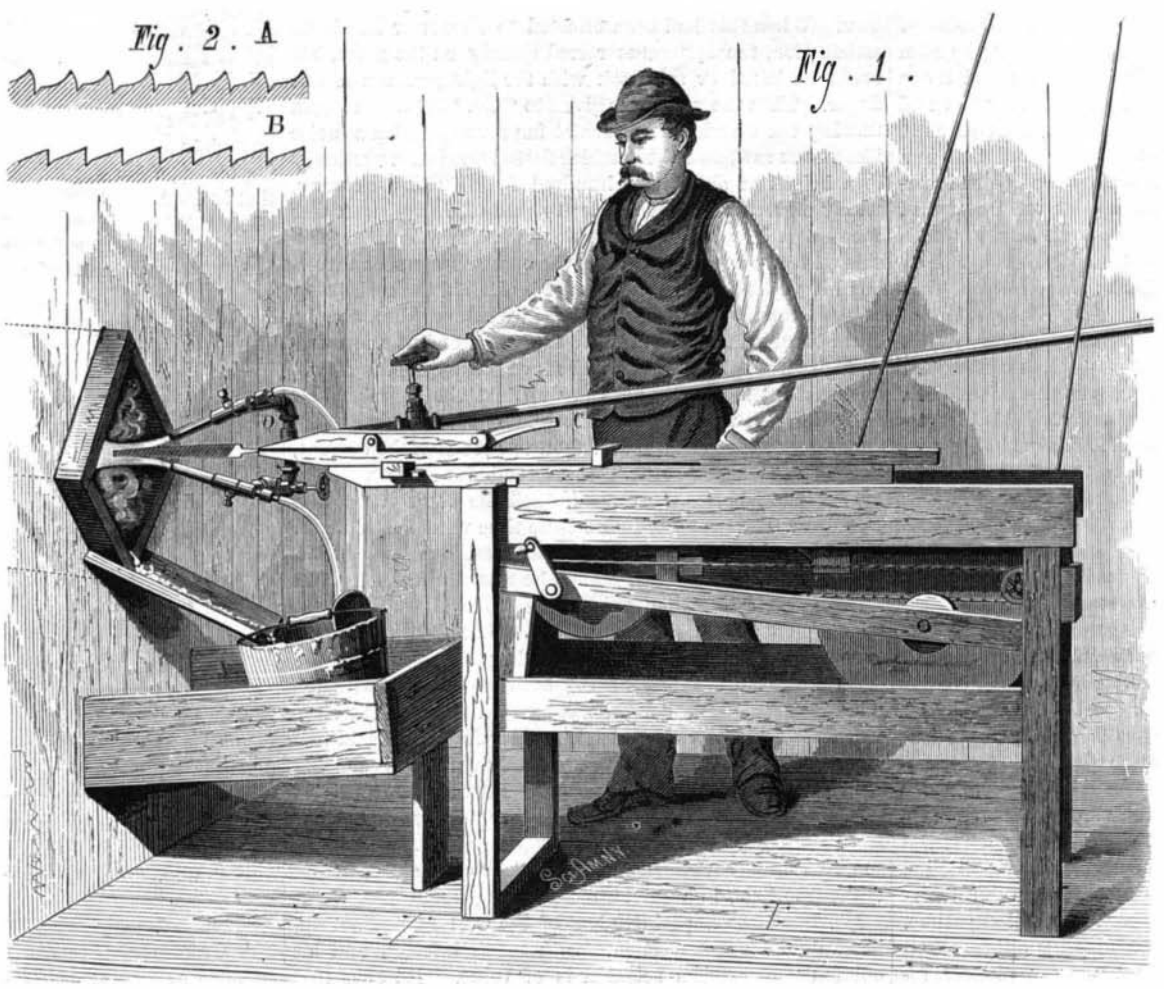
Referring to Fig. 2, at A, we have represented file teeth as ordinarily cut; at B, the teeth are regular and perfectly chisel shaped, and the difference is clearly apparent. The mode of changing one form of tooth into the other simply depends upon directing the sand blast against the back of the teeth at an angle of from 10 to 15 degrees to the tanged end of the file. Naturally, however, it will be asked why the blast has, as it obviously must have, a selective action; that is, why it does not cut away the tooth uniformly, with the apparently unavoidable result of dulling instead of sharpening the tooth. Here, however, comes in one of those exceedingly neat performances which are always a pleasure for the mechanic to appreciate. The effect of the sand blast is in some measure proportionate to the resistance offered. Thus, a layer of rubber varnish or even a piece of paper will turn a blast which cuts into the hardest stone, simply because the particles rebound from the elastic surface. Now, a tooth from its wedge shaped form may be regarded as offering a constantly decreasing resistance from base to point, the latter becoming, as it were, more and more spring like. The consequence is that while the sand cuts, say, with full force into the resisting base, its force is decreased by the yielding and elasticity of the point. Hence more metal is abraded at the base than at the apex, and the obvious result is that the point is ground away in very much less ratio of rapidity than the body of the tooth. Hence the latter must have at all times a keen edge. It is, furthermore, an obvious corollary that repetition of the process cannot affect the result. A file may be used until dulled, subjected to the blast again, and the teeth are at once restored to their former shape, and this may be continued as long as the teeth preserve their general shape.

The process is equally applicable to the dead smooth file or the coarsest rasp, and the temper of the tool is in no wise injured. The inventor informs us that a new file sharpened by the sand blast has outlasted six others of the same make and size not so sharpened, and has displaced fifty per cent more metal with the same number of rubs, and the inventor further claims that an old worn out file resharpened by the blast will do more service than any new file not so treated.

The simple apparatus used for applying the blast is represented in Fig. 1. The file is suitably held, and at the same time is moved forward, with also a to and fro sidewise motion. Sand and water from the bucket below is impelled upon each side of the tool by the steam from the pipe, C, entering the injector nozzles at D. The jets mingle and enter the large inclined tube, out of which the water and sand run back into the pail.

When dead smooth files or delicate edge tools are to be sharpened, the pipes to the nozzles are raised, so that water holding but little, and that the finest, sand in suspension is injected, and in this way, by lowering the inlet, the quantity of sand taken up, and hence the abrasive force of the blast, may be varied.

The inventor informs us that many shops in Bridgeport, New Haven, Hartford, and other New England manufacturing towns are availing themselves of the process at a large saving of expense. The Nicholson File Company of Providence have also contracted for its application to the files manufactured by them. For further particulars relative to licensing, etc., address the patentee, Mr. Milo A. Richardson, Bridgeport, Conn.



FILE SHARPENING BY THE SAND BLAST.

New Agricultural Inventions.

In an improved Churn, the invention of Mr. G. W. Jones, of Farmington, Ky., the apparatus for reciprocating the dasher consists of two differential pulleys and adjustable levers and connecting rod, whereby power and speed may be varied, as required by the condition or quantity of the cream to be churned at a given time.

Mr. John Clayton, of Brainerd, Minn., has invented a Wheel Attachment for Plows, for which it is claimed that the construction is such as to admit of adjustment for use with different kinds of plows, and to cut any desired width and depth of furrow; that it will cause the plows to work at uniform depth, and hold them to their work without attention from the plowman, except at the beginning of a furrow.

Mr. D. G. Rich, of Sand Bank, N. Y., has patented an improved Milking Pail, the cover of which is made with a central strainer of gauze wire, having about its edges a raised and flaring funnel which is permanently fixed to the cover, and into which the stream of milk is directed.

Messrs. G. F. Newell, Sr., and Joseph Croft, of Osseo, Wis., have made an improvement upon that form of grain separator in which the mixed grain and impurities are passed over a perforated screen by the frictional contact of a revolving endless apron. It consists in arranging the screen at an incline, to facilitate the passage of the grain, and in combining therewith a peculiar tension-adjusting device, which serves to keep the apron tight and flat down against the grains on the surface of the screen, to prevent the cockle grains from jumping the holes, as they would, in passing down the incline from their own momentum, if the apron became loose and baggy and only touched the grains at certain points.

Mr. John Wisda, of Defiance, Ohio, has devised an improvement in the Braces of Thrashing Machines, and for holding similar large and heavy machinery steady while being used. The brace is formed of a base bar having a hook which is hooked upon a wheel of the machine, and having notches upon its upper side, into which the lower end of an inclined bar is placed. The upper end of the latter is pointed and rests against the frame of the machine, and is secured by a hand screw.

A new Cultivator, invented by Mr. D. L. Wellman, of Frazee City, Minn., has the advantage of a form of construction which permits considerably increased width without impairing its strength or making it unduly cumbersome and heavy.

In a new Plow, the invention of Mr. J. Oldendorph, Jr., of Waterloo, Ill., the special feature is the mode of securing the handles to the iron beam, so as to firmly brace them against vertical strain. This is effected by an arrangement of braces which bear upon the beam, mouldboard, and handles, binding the parts securely together.

MOTHER-OF-PEARL may be polished with finely powdered pumice stone which has been washed to separate the impurities and dirt, and then finished with putty powder and water applied by a rubber, which will produce a fine gloss.