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## Improved Dovetailing Machine.

The machine herewith illustrated is one of a very useful and highly desirable class, as the quality of joiner-work done by it is very much better and can be afforded at lower rates than that executed by hand. This machine is simple and strong; it is easily operated, and has no "gim-cracks" about it to get out of order. All the movements are positive or straight up and down, and do not require an enormous expenditure of power to move a quantity of machinery that might have been dispensed with. Our engraving represents a machine with a wooden frame, but those now made by the inventors have cast-iron frames and are of a more elegant appearance; the character of the machine and the disposition of the several parts remains the same. A short inspection of the machine is sufficient to enable any one to comprehend its workings, and we append a brief description which will aid the reader in his examination of the same:—

The dovetail made by this machine is peculiar in that it is round; both tenon and mortise are made on one machine and at the same time. The cutters and bits, A B (Figs. 1 and 2), run in the bearings, C, and are driven by belts passing over the pulleys, D. On the end of the machine, towards the reader, there is fitted a table, E, working in guides, F. The stuff to be dovetailed is placed on this table and secured by the clamps, F', and the clamping screws, G; the table has a horizontal motion to and from the bits. The treadle frame, H, works in the guides I, and has a series of chise,ls or cutting tools, J, affixed to it, which can be seen in an enlarged form in Fig. 3. The table is also provided with a scale of inches and a sliding plate, K. The treadle is hinged at a, so that it can be removed when not in use. There are, further, adjustable stop pieces at L, which are also furnished with a scale of inches and can be adjusted as desired; so also can the stop, b. On the extreme end of the machine are the cutters working in the guides, N, and the table for sustaining the work operated on. The plan of the machine in Fig. 2 shows the bits more clearly than the perspective view. The table has also a vertical movement, but is operated by the screw, M, instead of a treadle as on the further end. These are the principal details of the machine; the operation of it is as follows:—

When the machine is started, the bits and cutters revolve rapidly; the table is drawn out as far as possible from the cutters, and the gage set to correspond with the desired depth of the mortise. The board to be dovetailed is laid on the table and firmly

secured there; it is then slid up to the revolving bits which rapidly cut out a cylindrical hole. The table is then drawn out and the workman, by pressing his foot on the treadle, brings the chisels up against the planks and cuts out the neck left by the bits. The gage on the other end of the machine has been set to correspond with the first one, and the male dovetail is produced by the rapidly-revolving cutters—the table being elevated or depressed as required by the screw, M; these boards now only re-

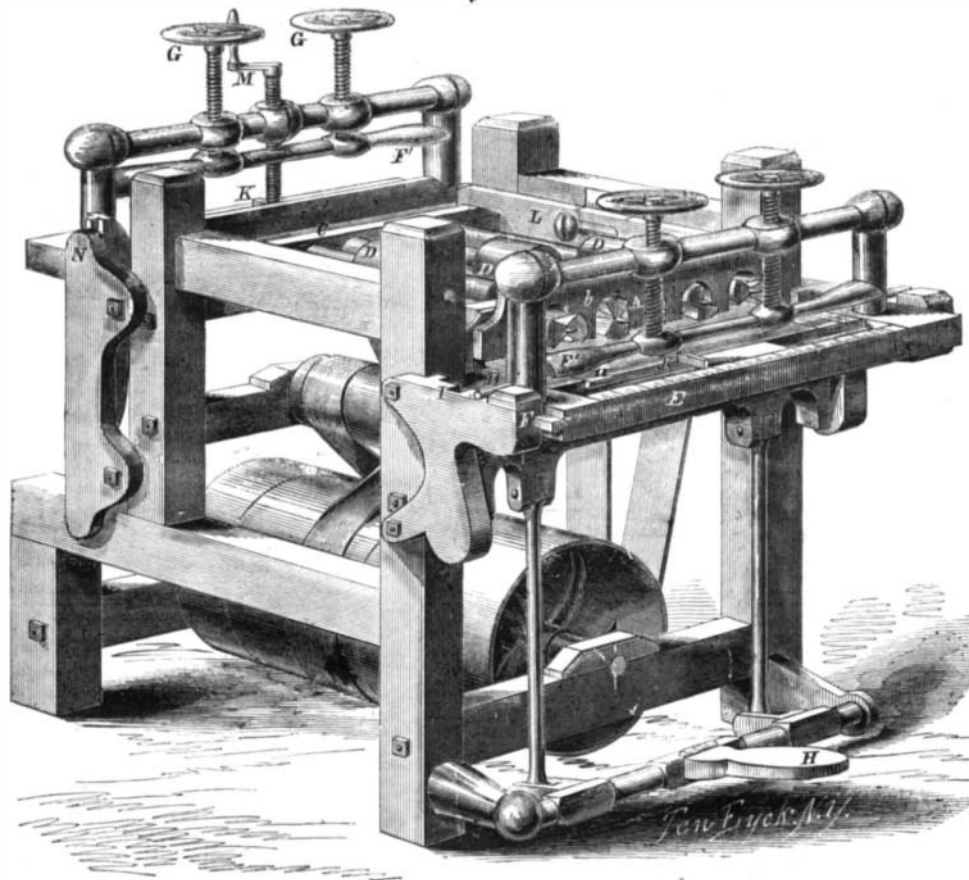
craftsman. Even then, while these children of the forest were painfully laboring on their clumsy boats, the white man navigated the sea with ships which, although not by any means clippers, could not have performed their voyages with safety unless they had been wrought into shape by the aid of wood-working machinery of some sort or other.

The earliest mention of any tool for working is not easily decided, but the tool itself was probably an ax, as being the most direct and positive in its operation and result. It is a most efficient implement in the hands of those accustomed to its use; with it the Russian workman makes chairs, tables and all sorts of domestic furniture, and it supplies the place of a workshop to the inhabitants of that country. The ax, however adapted to those primitive days, is far from desirable in these, when elegant, rapid and perfect wood-working tools are in demand.

In combining several pieces of wood for carpentry, as in dovetailing, the different circumstances of the plank, as respects its length and width, should always be borne in mind. Provision must be made so that the shrinking and swelling are as little restrained as possible, otherwise changes in the atmosphere will warp them with an irresistible force. The principal reliance for strength must be placed on wood cut with the grain so far as possible, as it is of course much less liable to break than a cross-section. When the grain of the four sides of a box run in the same direction, they will expand

and contract equally and do no mischief to the work, and it is in all cases more advisable to prepare boxes in this manner than in the way pointed out previously, which is likely to result injuriously; these matters are well understood by all who have, given the subject attention. The ordinary methods of dovetailing consist in providing the edge of a board with a series of projections, not unlike in shape the tail of the bird from which the work is supposed to receive its name. These projections fit into recesses of a corresponding shape and size in another board, and the whole, when firmly glued together, forms a strong substantial joint without the aid of nails. We are unable to trace the origin of this invention, but it has been universally adopted at the present day, and until quite recently (comparatively speaking) was always performed by hand. It was once thought to be great evidence of fine workmanship when a young man could produce a perfect dovetail without botching it, and have all the joints come tight, fair and even. This of course involved great expenditure of

Fig. 1



KING AND NORRIS'S DOVETAILED MACHINE.

quire to be fitted together and glued to form a strong and substantial joint. The advantages claimed for this machine are greater rapidity of execution, combined with accuracy of workmanship, which points will, we think, be conceded by all.

Among the minor evidences of the progress of any nation toward a high degree of civilization and social cultivation, there are none more prominent than the uses to which the various woods known to commerce are applied and made subservient either for decoration or more substantial benefits. The first attempts at wood-working were rude and awkward enough, and we can recall to mind how the aborigines, unacquainted with any better method, yet impressed with the necessity for using some means, felled trees by the aid of fire and the rude stone hatchets they found in the mountains. The canoes by which they navigated the waters of the ocean were also hollowed out by the agency of fire and sharp shells, and the workmanship, as may be supposed, was in keeping with the skill and appliances within reach of the

time and labor, and did not pay for the outlay except in cases where high prices were obtained for work. All this has been changed by the introduction of dovetailing machinery, and the tool herewith illustrated is a very excellent one of its class. The ordinary dovetail is very apt to break off at the necks and split in the recesses, and is objectionable on this account, unless great care be observed in its manufacture. This feature is avoided in the work produced by Norris & King's machine, which is, so far as mere technicality is concerned, *not* a dovetailing

the different iron rolling mills of the country turned their attention to rolling gun-barrels out of American iron, and had no doubt of their success. It is said that Washburn, the celebrated car-wheel manufacturer of Worcester, has expended \$100,000 in experimenting on them, but no one has been very fortunate. At first the Amoskeag Company supposed they could purchase the barrels ready rolled, but found they could not rely upon getting perfect barrels, so they bought English iron, forged their barrels for their first lots, and have now nearly com-

a gauge, and its strength, and puts his mark on each piece. Mr. Jacobs is the chief inspector, and he has two assistants to see that everything is perfect. Each part of a gun will fit every other gun, every piece being fitted to a gauge, so that if on trial a hammer, screw, trigger, ramrod, or any other part should fail, another one is ready. The tests applied are severe, especially to the barrels, ramrods, bayonets, locks and tubes. The barrels, before being completed, are tested in a room made for the trials, with five times as much powder as one would dare

Fig. 2

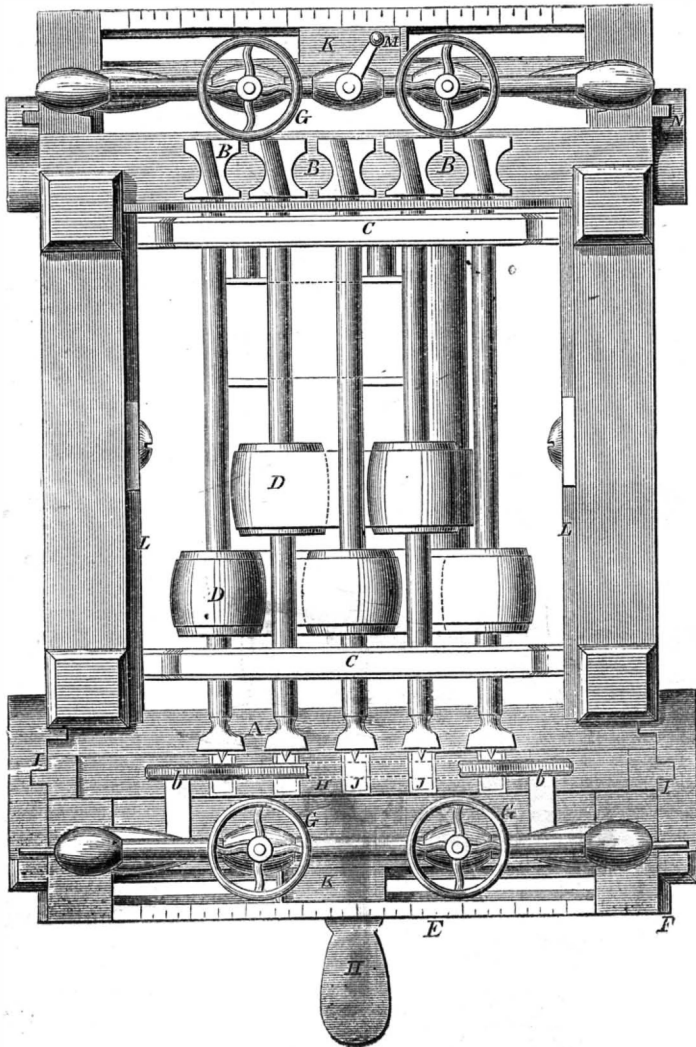
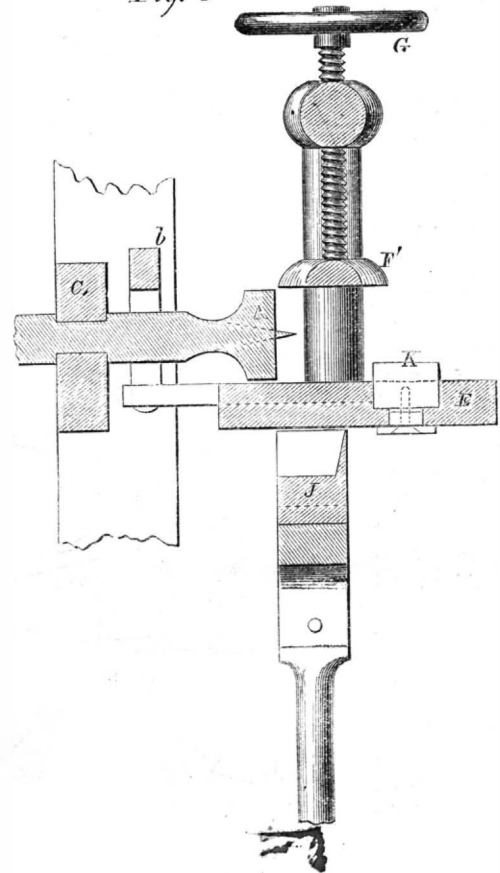


Fig. 3



### DOVETAILING AND MORTISING MACHINE.

machine, for no one ever saw a dove with a tail resembling the work turned out by them. The patent papers before us describe the work as a "pedunculated disk," as this term is *rather* incomprehensible to most persons, we may say that the portions of the wood (left by the tools) which fit into each other are round and connected by short square necks to the board; the recesses are of course similar and the two fit together perfectly when completed. This invention was patented on January 22, 1861, by D. A. King and T. Norris, of Lexington, Ky. For further information address them at that place.

#### The Amoskeag Gun Factory.

The Amoskeag Gun Manufactory is an important addition to the works in this city. The Amoskeag Company got a contract from Government for making Springfield rifled muskets one year ago this month, though they had promise of it earlier, so that they commenced putting in machinery some two months previous. In their regular machine-shop they had worked on guns the previous year, but arrangements for carrying on the gun business permanently was not started till about fourteen months ago. We do not speak now of the nice, varied, and complicated machinery necessary for forging, forming and finishing the stocks, locks, bayonets, barrels, ramrods, and trimmings, but of the materials and making of the barrels. As soon as the war became a settled thing,

completed machinery for rolling their own as fast as they wish. This is the last piece of machinery necessary to enable them to make every part of a rifle from the crude material, and there are only some three gun-shops in the country that can say as much; they are apt to get their locks at one place, their barrels at another, and so on with the different parts.

The Amoskeag Company have very efficient machinery, the patterns of which they bought, and duplicates of which they made at their machine-shop. When it is known that the crude materials have to go through about 500 different operations before they come out a gun, it becomes evident that it was a long operation to make so much machinery, and the wonder is that they are now in perfect running order. It is wonderful to what perfection inventors have brought machinery, so that a slab of black walnut is rounded, grooved, perforated, dished out and dovetailed till it becomes a perfect stock, ready for the lock, barrel, ramrod, butts, rings, trigger and guards, needing no other finishing than sand-papering and oiling! This walnut slab goes through eighteen operations with machinery before it is finally completed.

However much contractors may have cheated the Government in other departments, they have a poor chance for doing so with guns. The Government keeps an inspector here who examines every part of the gun before it is put together, tries it by

to use if he held the gun in his hands. Slugs and an immense amount of wadding are put on top of the charge with an apparent design of bursting the barrels if possible. Very few burst. The bayonets and ramrods are bent, struck upon timber, and their quality is otherwise roughly tried. After a gun has stood the inspector's trial it is good for a campaign.

The Amoskeag Works sent off the first lot of the Springfield rifled muskets last week. They are now making them at about the rate of 2,000 a month. At the end of two months they will be able to make a hundred a day. They now employ on this work about 250 men, and will increase the number to about 350. All this work will be permanent for years. In addition to those of the Springfield pattern of 1861, they have a contract for making Lindner's breech-loading carbines, and with both this and other contracts in prospect they will find work enough. This carbine is a most serviceable weapon—as good a one as there is in the service.

Some might suppose that the gun business would be overdone, but it is said that the guns average only two years of service, and if that is the case, for many years there will be no danger of a surplus.

The gunmakers receive good pay, and the business keeps among us an excellent class of citizens. For this business we are indebted to the enterprise, far-sightedness and perseverance of E. A. Straw, the agent of the Company.—*Dollar Weekly Mirror*