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NEW SERIES.

## Combined Sawing, Boring, Molding and Planing Machine.

The annexed engraving represents a machine designed by a practical mechanic for doing a great variety of work in cutting and boring wood, and which on trial is found to be a very convenient and useful article in machineshops and other wood-working establishments. It is a very simple combination of a circular saw with a rotary cutter and boring tool, all of these being placed on a single shaft or mandrel.

The shaft, *a*, carries near one end the circular saw, *b*, and near the other the cutter head, *c*; the hole for

screw in the end of the machine not shown in the cut.

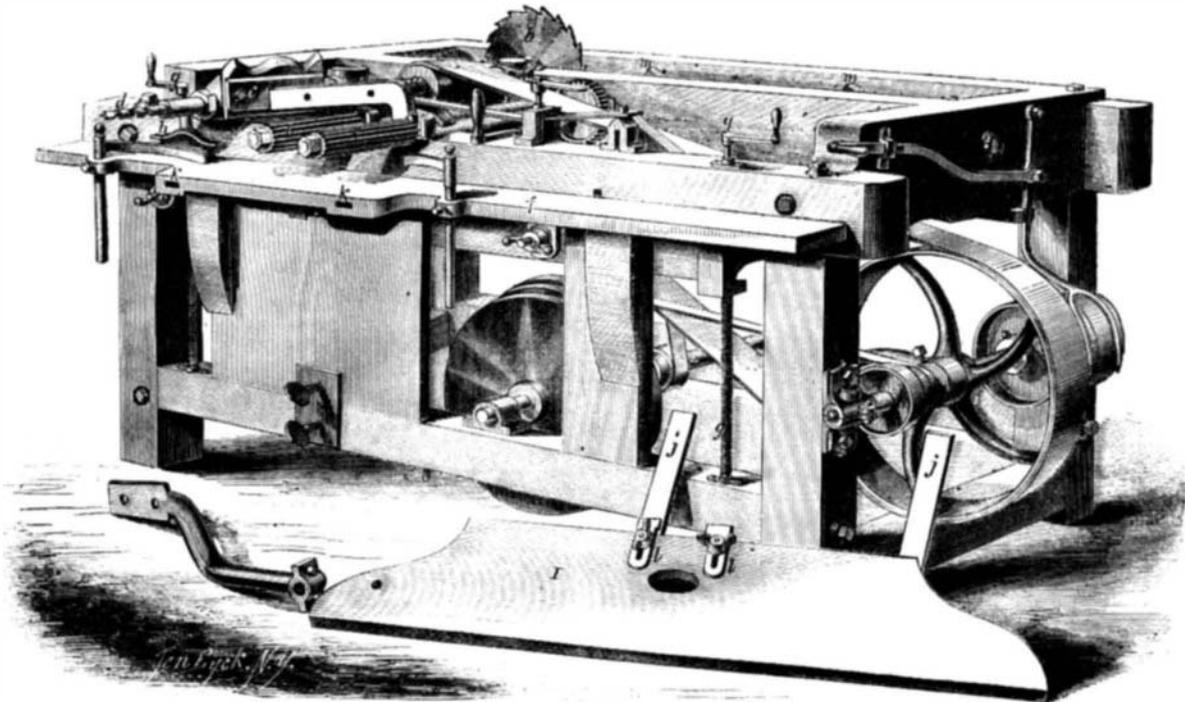
The mode in which motion is imparted by belts to the several parts will be readily understood from an inspection of the cut.

The patent for this invention was granted July 29, 1862, and further information in relation to it may be obtained by addressing the inventor, John H. Post, at Paterson, N. J.

### Report on Testing Iron Armor Plates.

A commission was appointed by the British Government to make experiments with iron plates and

faced plates are recommended. Backings of wood or fantastic elastics are of no avail, but backings of cast iron or granite are well spoken of, and a facing of four inches of elm was found to save the plate considerably. Mr. Grantham's proposal to sheath the bottoms of iron ships is approved of. There seems, however, to be a conviction that a ship of 5,000 tons burthen is the smallest size to which armor can be applied with advantage. The most satisfactory results were obtained from iron plates exceeding 2 inches and less than 3½ inches in thickness, as a facing to brickwork, although the commissioners reserve their opinion on the whole ques-



POST'S COMBINED SAWING, BORING, MOLDING AND PLANING MACHINE.

the shank of the boring tools being in the extreme end, *d*. The fluted rollers, *e e*, feed the stuff along as it is being planed or molded by the cutters in the head, *c*; the stuff resting upon the table, *f*, the height of which may be adjusted to the thickness of the stuff by means of the screws, *g g*, which are provided with cranks at their upper ends for turning them. The feed rollers are held down at their journals by a cap and spring, and a spring, *h*, holds the stuff down as it passes from under the rollers.

The table, *I*, for supporting the stuff while it is being bored is represented as detached from the machine and lying upon the ground. This table is supported in the machine by the arms, *j j*, which enter the slots, *k k*, and are held in place by set screws, so that the position of the table may be adjusted to regulate the depth of the holes. Further provision is made for regulating the depth of the holes by the adjustable stops, *l l*.

The machine is represented with the table on which the stuff rests while being sawed, removed to show the mode of adjusting the height of this table. The inclined planes, *m m*, are secured firmly to the frame of the machine, and similar inclined planes fitting these are secured to the lower side of the table, so that by moving the table lengthwise its height is varied. This longitudinal motion is imparted by a

targets in order to ascertain the best mode of constructing armor-clad war vessels. The *Army and Navy Gazette* commenting on the subject says:—

The commissioners, in judging for themselves after a series of experiments, have, we are told, come to the conclusions—First, that the material best suited for armor plates is wrought iron of the softest quality; and that it need not be of the highest price, for hammering or rolling, or both, will produce all that is needed. The commissioners, therefore, are led to recommend the erection by Government of machinery for the manufacture of their own plates. Captain Dahlgren may be pleased to learn that the commissioners do not think the measure of the absolute destructive power of the shot is its momentum, but the work—*vis viva*—accumulated in it which varies directly as the weight of the shot multiplied into the square of the velocity at impact. The American plan of bolting thin plates together, adopted in ignorance of statical laws, is altogether condemned. The commissioners, we hear, also arrive at conclusions unfavorable to angulated sides, in so far as this, that they consider iron is more usefully disposed in vertical plates of a given thickness than the same weight would be if disposed in thinner plates placed obliquely to cover the same vertical area. As the junctures are weak the largest sized smooth-

tion for the present. The *Warrior* target received a tremendous hammering from 3,229 pound of shot fired from 68-pounders, 100-pounders, 200-pounders and one 140-pounder, and though the tonguing and grooving are objectionable, it has sustained a greater amount of firing with less injury than any other construction, and proved far superior to Mr. Roberts's target. "Two 68-pounders cracked the plate and broke two bolts; three 100-pounders, fired in salvo, broke a hole 18 inches by 9 inches, and cracked the plate across." Mr. Fairbairn's targets were utter failures. The experiments so far do not authorize the commissioners to recommend the abandonment of wood backing. On the whole, the amount of facts collected in the report, we understand, is enormous, and the commissioners deserve great credit for their patience and perseverance. It would be well if the members abstained, whilst serving on the commission, from putting forward their own targets, at least till they have inquired into all the plans which may be submitted to them.

RASPBERRY bushes should now be looked to and the bearing wood of the present year cut out to give the new shoots a good growth for the next year's crop; in this way they will attain a much stronger and more vigorous growth.