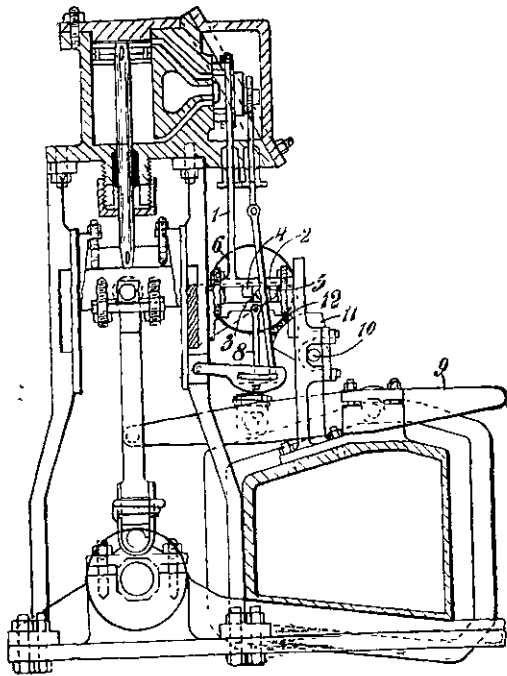


# Inventions.

## Brown's Valve Gear.

Mr. B. H. Brown, of New Plymouth, is the inventor of the reversing gear for steam engines illustrated below. It will be seen that the valve rod, 1, has a slotted bracket, 2, within which a crank pin, 3, of a shaft, 4, and its brasses, 5, are fitted. The crank pin carries upon its free end a block, and to the middle part of the crank shaft, 4, a toothed reversing wheel, 6, is fixed. The block upon the end of the crank pin passes into a slot provided by a clamp upon a second or driving crank shaft which is



BROWN'S VALVE GEAR.

revolved by the connecting rods fixed to the rocking lever shown in the elevation. A reversing lever is fixed upon a shaft, 10, upon which an arm or sector, 11, is fixed, having a rack, 12, adapted to gear with the toothed reversing wheel, 6. To reverse the engine the crank pin and reversing wheel are revolved by the rack, 12, being brought to engage with reversing wheel, 6, which is operated by a lever upon shaft, 10, thereby reciprocating the valve rod, in the bracket of which the crank pin slides.

## Robinson's Vertical Square-Hole Mortising and Boring Machine.

Messrs. Thomas Robinson & Son, Ltd.'s square-hole mortising and boring machine is an appliance

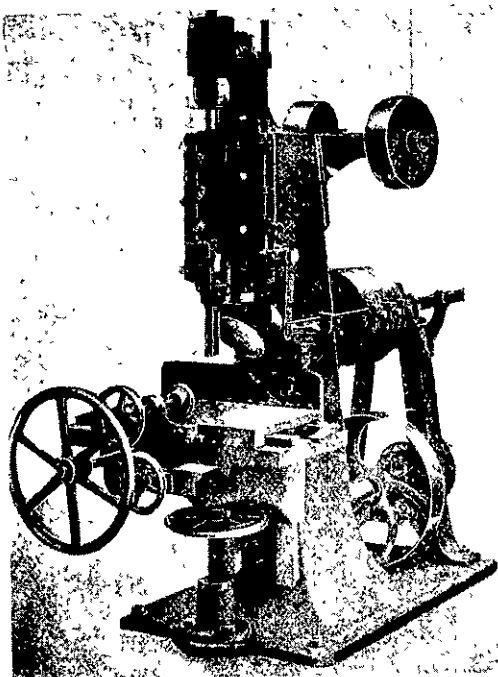


FIG. 1 ROBINSON'S VERTICAL SQUARE-HOLE MORTISING AND BORING MACHINE.

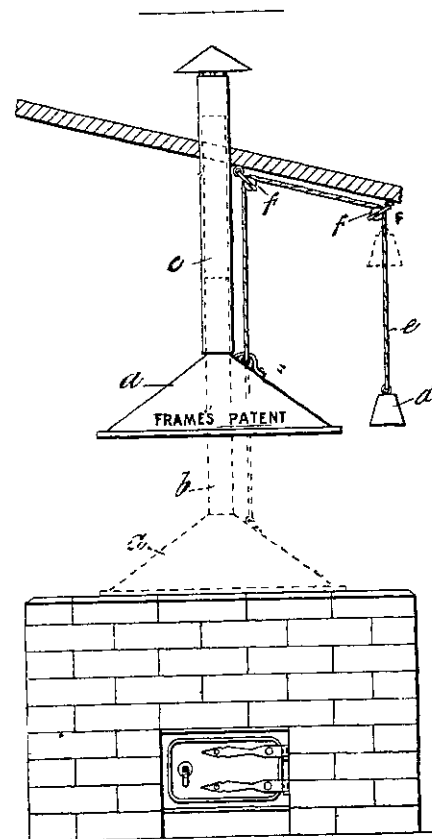
of more than ordinary merit, and is likely to prove valuable to many of our readers who are owners of saw mills and engineering establishments where timber is largely utilised. We find pleasure in furnishing the accompanying engraving, and would remark that it is capable of cutting a clean mortise at one operation; will deal with timber of any size up to 12in. by 12in., and mortises 5in. deep and 1 1/2in. square by means of a square-hole chisel, with a bit or auger (Fig. 2) revolving inside. The tool is mounted on a vertical slide, which is traversed up and down by means of a screw driven by open and cross belts, adjustable stops being fitted to the slide to regulate the depth of travel of the chisel. The machine is fitted with compound sliding tables, with a screw clamp for holding the wood, the tables being arranged to rise and fall by a hand wheel and screw, to suit different thicknesses of timber. It weighs 23 cwt.; is priced at £90, exclusive of chisels and augers; and occupies a floor space of 6 1/2 ft. by 3 1/2 ft.

## The Frame Boiler Cover.

Our illustration shows a most ingenious contrivance invented by Mrs. Frame, of Oamaru, for the purpose of obviating the inconvenience caused through steam arising from washing coppers, when boiling clothes.

The "Frame" cover (a) is conical in shape and fits closely down upon the top of the washing boiler. The upper part of the cover is connected to a tube (b) which slides telescopically in another tube (c) leading into the furnace chimney or through the roof of the building. The cover is counterbalanced by weights (d) attached to the ends of cords (e), passing over the guide pulleys (f). The cover can thus be drawn down upon the boiler, as shown in dotted lines in our illustration, to carry away vapour arising from the boiling clothes, or it can be raised as shown in full lines in the drawing to give free access to the boiler.

The invention appears to fill a want long experienced in many households, and we expect to see some enterprising firm of manufacturers take the invention up and place it upon the market.



THE FRAME BOILER COVER.

## Women as Inventors.

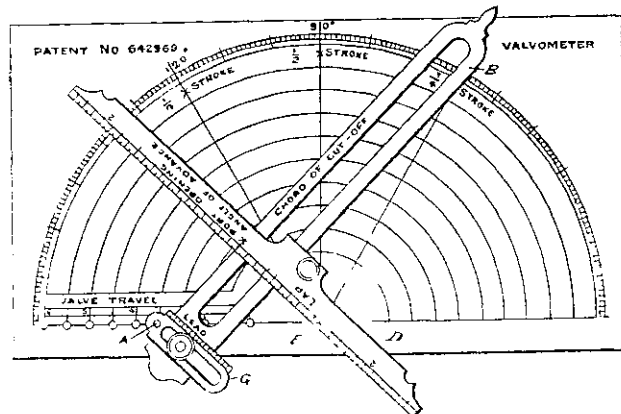
Women as well as men have achieved success with inventions. A French lady has received no fewer than 18 medals and diplomas at European exhibitions for her machine for cutting metal plates. Most people will remember the name of Miss Hosmer in connection with an invention for converting lime into marble. As far back as the year 1845 Miss Sarah Mather, an Englishwoman, invented a submarine telescope. It might not be expected that women's inventions would range far from the home department, but such is by no means the case, for among the mechanical devices invented by women are such out-of-the-way notions as a machine for driving barrel hoops, a steam generator, a bailing press, a steam and fume box, an automatic floor for elevator rafts, a rail for street railways, an electric illuminating apparatus, packing for piston rods, car couplings, electric battery, locomotive wheels, materials for packing journals, boring machine for

## Ellis's Valvometer.

This device, which is the invention of Mr. Peter Ellis, of Wellington, is used as follows:—the slide (D) is first adjusted on the bar (E) to the desired lap to be given to the valve, and then the pin (D) is inserted in the aperture (C) indicating the intended slide-valve travel. The index bar is now swung over the plate (A) until its edge indicates on the intersection of the semicircle (C) leading from the pin (D), having the radiating line (B) of the desired stroke or degree of cut-off, and then the head (G) is adjusted on the bar (E) until its graduated edge (G) extends through the centre for the semicircle (C). The distance from the zero point of the graduation (G) to the centre of the semicircle gives the lap of the valve, and the distance from the zero point on the graduation (G) to the semicircle (C), corresponding to the aperture in which the pin (D) is inserted, indicates the port opening. The edge (G) also indicates on the indicator (B) the angle of advance of the eccentric. Thus, for instance, as shown in the illustration, the device is set for a valve having four inch travel and a lead of three thirty-seconds of an inch, the cut-off being one-half stroke, the angles of advance of the eccentric one hundred and thirty-seven degrees, the lap barely one and three-eighths of an inch, and the port, opening five-eighths of an inch full. From the foregoing it is evident that when the valve travel and the lead is given, the other dimensions can be readily found without any further calculation whatever.



FIG. 2.



ELLIS'S VALVOMETER.