VERTICAL ENGINES AND BOILERS.

There are certain excellences sought after by nearly every builder of steam engines, namely, economy of fuel, regularity of speed, simplicity of mechanism, durability and freedom from derangement, power with a given size of cylinder and pressure of steam, and, lastly, elegance of design and finish.

In stationary and steam yacht engines we find an infinite variety of construction, some of unsymmetrical form, roughly constructed, with slight finish, and again others having every improvement that is considered really such by the designer, with elaborate finish and beautiful but simple mechanism. As an illustration of the latter class we have selected some engines constructed by the New York Safety Steam Power Company, of New York city. Fig. 2 represents a form of engine they construct for yachts and launches; the engraving is taken from one of ten horse power. Engines of this class are fitted with link motion for reversing, and are furnished with notches for working expansively. The outline of this engine is one of great elegance, and the disposition of the moving parts is compact without being too confined for examination and oiling. Fig. 1 represents the steam launch Barrancas, one of the many built by this company. This one was built for the Quartermaster's Department, U.S.A., and gives a very good idea of this class of boats. She is 61 feet long over all, 10 feet 10 inches beam over the fender strakes, 4 feet 6 inches draught aft. The after cock pit is 20 feet 6 inches long, and the forward one 11 feet long, the average width of both being 8 feet 6 inches. The total length of seating, including thwarts, is 78 feet. Fig. 3 shows a combined vertical engine and boiler which may be properly considered semi-portable. This form is suitable for a great variety of small industries to which motive power can be advantageously applied.

The engine is not fastened to or upon the boiler, and is, therefore, not affected by the expansion, nor are the bearings overheated by conduction or the ascending heat from the boiler. The boiler is a patented vertical tubular one, with internal fire box, and, we are informed, is made of the best material and workmanship. The heating surface and area of grate, it is claimed, are in excess of the quantities usually allowed for the same power. The engine and boiler are placed on a base, which also supports the boiler, forms the ash pit, and contains the feed water heater. A neat arrangement collects all the drip from the stuffing boxes, the bearings, and the pump, into one cup, where it can be conveyed away as desired. The exhaust steam is discharged through a blast pipe in the stack. The fly wheel being at the base secures steadiness under the high speed which is necessary for economy of fuel.

At the rooms of the Company, 30 Cortlandt street, New York city, are a fine stock of engines for various purposes, and numerous models of yachts, fast pleasure boats, and launches, some of them of unusually graceful proportions.

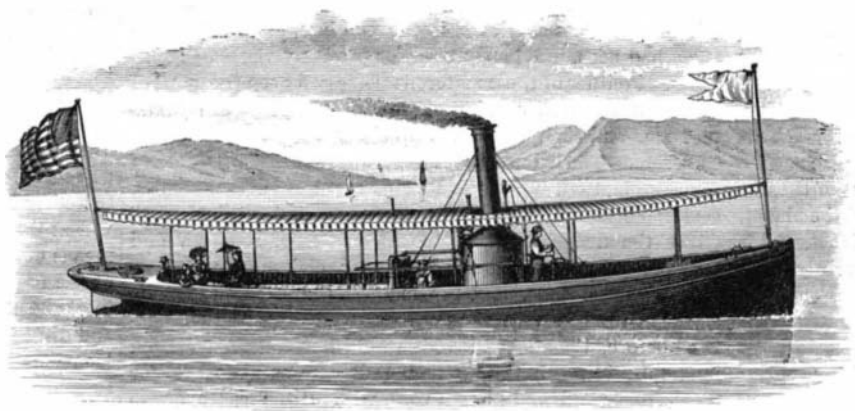


Fig. 1.—STEAM LAUNCH BARRANCAS.

SCHOOL SHOPS.

Not merely shops of the nature of the kindergarten for older children, or of affording the rudiments of a knowledge of the trades as now practiced in America, but shops affording a knowledge of the many practical industries not now established in America. Little shops which teach other uses of raw material than those now known, and incite to the establishment of workshops which shall grow to great industries. One crying defect of the eager superficial system of most American teaching, either in books or schools, is that there are no handbooks of practical information from which a knowledge of the production of a great number of articles may be obtained. Since the labor societies and the compulsory school laws keep boys still more from apprenticeships, there should be a series of cheap practical handbooks within the reach of every boy, and, at the same time, so practical that a knowledge of the pursuit may be easily worked out.

Practical common sense shops, where a boy may earn his expenses and learn a trade, or, by paying for his night attendance, may learn the rudiments of any pursuit to such an extent as to be able to put his knowledge to practice. How few people in America know the nature and uses of clay, or know what clay is! Plaster of Paris, or how obtained, to say nothing of working it. Probably not one person in a thousand, in the United States, knows that placing a piece of limestone, so common all over the country, for an hour upon a coal fire, converts it into lime. This is not an isolated instance, but the rule is that the first rudiments of practical knowledge are not provided by books or schools, and until they are children will read trash and be ignorant of the means by which they may be useful citizens.

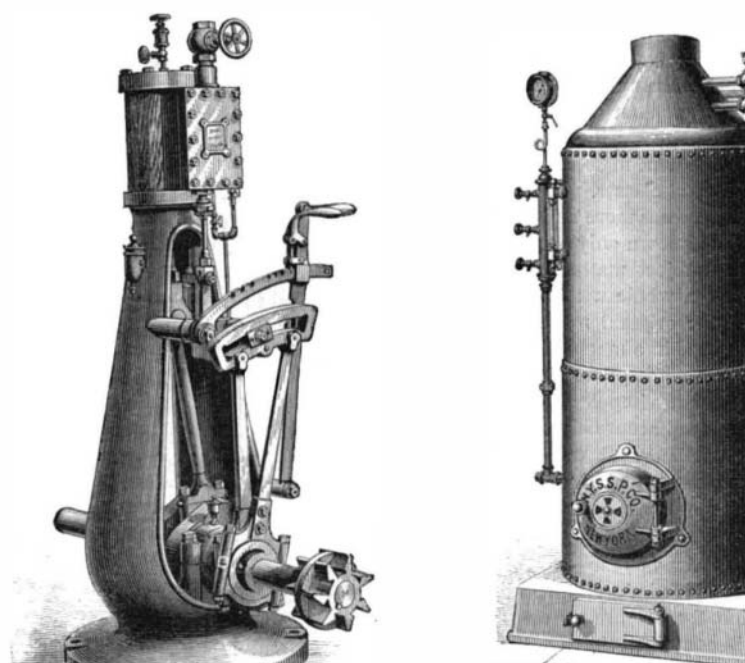


Fig. 2.—10 H.P. LAUNCH ENGINE.

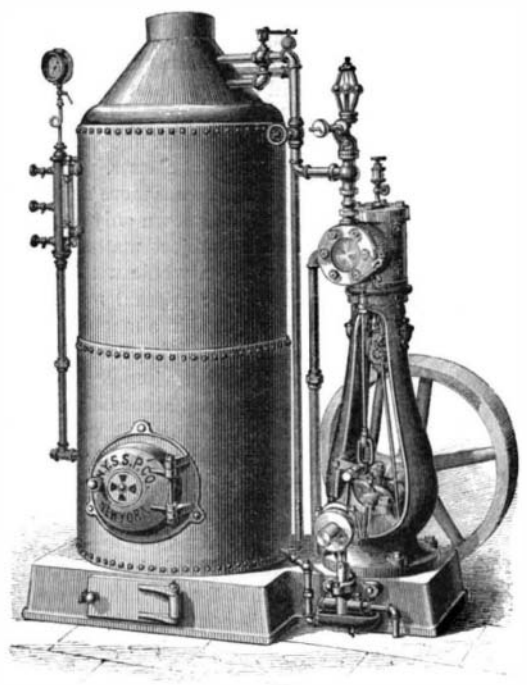
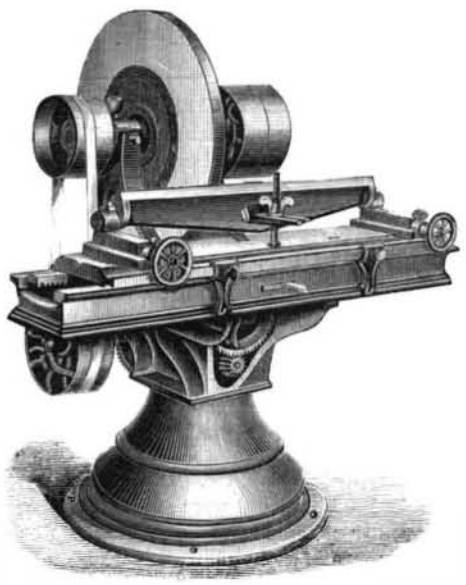


Fig. 3.—VERTICAL ENGINE AND BOILER.

IMPROVED AUTOMATIC KNIFE GRINDER.

We illustrate herewith a new grinding machine for grinding and sharpening planer, paper cutter, and other long



AUTOMATIC KNIFE GRINDER.

knives used by belt makers, curriers, rubber and paper workers, etc. It is claimed that a long knife can be fastened to the machine, adjusted, and ground perfectly straight in ten minutes. A solid emery wheel with iron center is used, working at a speed of 225 revolutions. The platen to which the knife is bolted works similar to that in the metal planer, and can be instantly adjusted to traverse any distance from 2 to 36 inches. The advantage of the iron center is that it can be recovered after the wheel is worn down, thus saving the cost of a wheel of the size of the center. In this way only the emery actually used is lost. The present machine, we are informed, is manufactured with especial care.

All the gears are turned and cut; the spindle boxes are made in halves (same as for engine lathes), and are also fixed and permanent, requiring no adjustment as the wheel wears down. The spindle and all the shafts are made from steel. The bearings are made very long, and all parts of the grinder are interchangeable.

For further particulars address the manufacturers, the American Twist Drill Company, Woonsocket, R. I.

London Water Works.

Nearly all the waterworks companies of the metropolis are actively engaged in providing a constant water supply, and the number of miles of streets which now contain mains constantly charged, and upon which hydrants for fire purposes could at once be fixed, in each district of the metropolis, is given in Mr. Frank Bolton's report for the month of March, as follows: Kent, 80 miles; New River, 196; East London, 85; Southwark and Vauxhall, 112½; West Middlesex, 70; Grand Junction, 41½; Lambeth, 70; Chelsea, 56; making a total length of 711 miles; the water companies are ready to affix hydrants thereon when required by the authorities. The total number of hydrants erected is at present 4,527, of which 2,813 are for private purposes, 542 for street watering, 697 for public use, and 475 in government establishments.

New Mechanical Inventions.

An improved Key for fastening the bosses of wheels and levers to their shafts has been invented by Mr. P. A. Oliver, of Wilkesbarre, Pa. It has a cylindrical threaded head, to which is fitted a sleeve or nut made externally polygonal to receive a wrench, by which it is turned in the operation of extracting the key.

A Spanish inventor, Señor Luis Ybarra, of Madrid, has introduced a novelty in Revolving Firearms, consisting in the addition of a special chamber for receiving from the rear end of the cylinder a portion of the gas resulting from the explosion of the cartridge, and conveying it to one of the discharged chambers, to expel the empty shell.

Mr. L. Murray, of Greensburg, Pa., has invented a Railway Frog, which, in its normal position, keeps the main line open, but yields sufficiently to the side pressure of the wheel flanges to open the side track for a train passing over it on that track. The tongue is pivoted to the bed plate, and its point is held to one of the main rails by a spring, to keep the main track open.

A new Channeling Tool, invented by Mr. C. K. Sharood, of Detroit, Mich., belongs to that class of machines employed to cut a channel and groove, for the purpose of holding the thread or nails used in uniting the soles and uppers of boots and shoes. The feature of Mr. Sharood's invention is a casting, adapted to be secured to the machine, having an inclined socket carrying a tubular cutter, which is adjusted by set screws as it becomes worn.

Mr. J. J. Peux, of Brooklyn, N. Y., is the inventor of an improved Crown Push for stem-winding watches, which is claimed to be so constructed as to render the crown entirely dustproof, prevent rattling, and permit the movement being taken out of the case without removing the crown or key pipe.

A novel Rotary Engine, the principle of which is also applicable to a pump, has been invented by Oscar Stenberg, of Helsingfors, Finland. It is based on the differential action of a number of pistons acted upon successively by steam or water, so as to revolve a common crank coupled to the pistons; and it consists of a casing with four interior cylinders at right angles to each other, and connected by a duct having suitable entrance and discharge valves. The four pistons are coupled to the wrist pin of a crank at the interior end of a shaft turning in a stuffing box of the cylinder casing.

Mr. Nelson McIntyre, of Princeton, Wis., has patented a handy Wagon Lifting Jack, which is self-supporting when the load is raised, and may be closed up in compact form for convenience in storage and transportation.

Mr. C. Palmer, of Springfield, Tenn., has invented a Machine for Sewing Brooms with Wires, consisting of a combination of mechanical devices for clamping the broom, holding the wire bands which surround the brush, guiding the transverse binding wires through it, cutting them, and binding them over the wire bands.

An improved Glove Sewing Machine, invented by Mr. C. M. Boland, of New York city, belongs to that class of machines for sewing gloves, furs, and similar work, in which are employed two parallel feed disks, a reciprocating needle, and an oscillating looper. Special details are introduced, among which are an adjustable guide arm for laying over the seam one or more ornamental face threads, and a revolving brush to clear the edges of fur from hairs in sewing.

Mr. R. S. Munger, of Mexia, Tex., has invented an improved Cotton Gin Saw Cleaner, consisting of a series of knives supported by a movable frame, which may be thrust between the saws, cleaning them rapidly. The knives are readily detached from their support when it is desired to sharpen them.

A new Nut Lock, patented by Mr. J. L. Hayward, of South Framingham, Mass., is formed of a thick rubber