IMPROVED PORTABLE ENGINES.

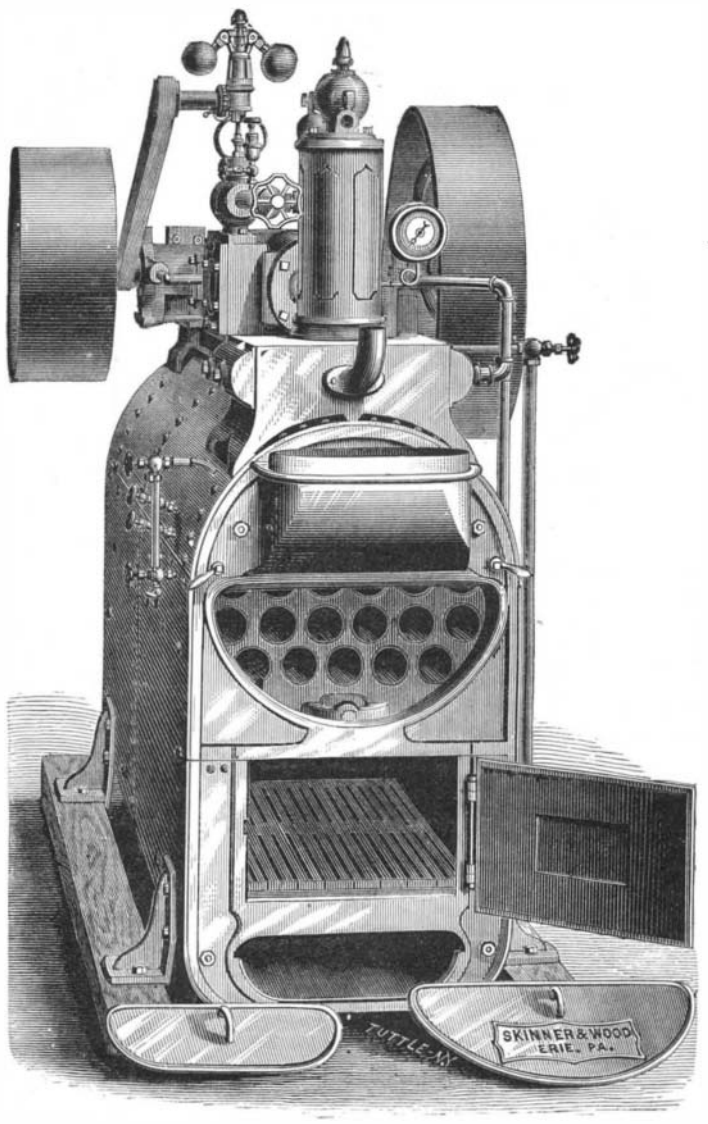
We give on this page two views of a compact and simple portable engine manufactured by Messrs. Skinner & Wood, of Erie, Pa. They are made in various sizes, from 2½ to 15 horse power inclusive, and special pains have been taken to adapt them to the smaller industries, also to domestic and agricultural purposes. The manufacturers inform us that they have hundreds of them doing work in printing offices, shops of all kinds, cheese factories, and dairies, in elevators and mines, and on the farm and plantation. These engines in more than ten years of use have earned a reputation for durability and economy, and they are very well and favorably known in many places outside of the United States. The salient features of this engine are its boiler and accessories, its stop-motion governor, its self-oiling connecting rod, and the drip catching devices.

The boiler, which is horizontal, is made of the best CH No. 1 iron in cylindrical form, and provided with return flues of the best lap welded iron, and is well arranged for economy and safety. The fire box has a movable bridge wall to adapt it to different kinds of fuel. The grate surface is ample for coal, wood, or shavings, and admits of the use of fuel which could not be used in most small engines in market. The bridge wall is made hollow to admit air to the gas and flame which pass over it, and thus complete the combustion of the fuel, avoiding smoke and the loss of heat generating material.

The stop motion governor, which is fitted to all of these engines, was suggested by the danger and annoyance which follows the breaking or running off of the governor belt. This, we believe, is the first instance of the application of a governor of this kind to portable engines. In case of the breakage of the governor belt, the weighted lever attached to the governor immediately drops and stops the engine. This lever may be adjusted by moving its weight, so as to change the running speed of the engine. The governor needs no readjustment when stopping or starting the engine. It is only in case of the breakage of the governor belt that it requires attention, and then the readjustment is accomplished in a moment.

The connecting rod used with this engine is of steel and of new and peculiar construction. It is provided with bronze boxes of the best quality, which are made hollow in part to receive oil. This forms a very efficient oiler, which does not require filling oftener than once in two or three days. The device for taking up the wear of the connecting rod is both novel and effective.

All of the parts of these engines are made to steel gauges, and may be easily replaced if broken or injured. The makers have studied to give these engines the good qualities of the larger engines, and at the same time to keep the prices within the reach of those requiring a small, convenient, and safe power.



PORTABLE ENGINE.—SIDE VIEW.

AGRICULTURAL INVENTIONS.

Mr. James H. Tanner, of Waco, Texas, has patented a combined planter and cultivator which is so constructed that the seed dropping appliances can be readily detached and the machine adjusted for use as a cultivator.

An improved fertilizer distributer, patented by Mr. Samuel H. Everett, of Macedon, N. Y., consists of a box in which a spoked wheel is revolved horizontally, by suitable mechanism, under a hinged adjustable shelf or cut-off and over a diagonally arranged opening in the bottom of the box, so that the delivery of the phosphates is made continuous and uniform by the passage of the spokes of the wheel over the diagonal opening.

Mr. Daniel Unthank, of Spiceland, Ind., has invented an improved two-horse cultivator, which is so constructed that the plows may be moved laterally and vertically without changing their pitch. It may be adjusted to give the plows any desired pitch to cause them to work deeper or shallower in the ground and to work closer or farther from the rows of plants.

Mr. Richerson W. Spencer, of New Lexington P. O., Ala., has patented an improvement in that class of cultivators by which both sides of a row can be cultivated at the same time; and it consists of certain novel features which cannot be described without drawings.

Mr. Edward N. Griffith, of Irvington, N. J., has patented a spading fork adapted for use in any soil. It consists in a spading fork having tines as usual, and formed between the tines at the head with knife edges, whereby the fork may be used to cut grass, sod, or roots, or to take the place of a spade in addition to its ordinary use as fork.

American Innovations.

The use of folding beds and cribs is becoming very fashionable in the United States. It is a question whether such beds would "take" in England, where the preference is given over wooden bedsteads to those of iron and brass. but in many other countries where it is customary to use the sleeping room as a day or living room, the folding bed, if known, would be a boon. Those known as the "Champion" automatic folding beds and cribs are really handsome articles of furniture, are easily manipulated, and of most simple construction. When open and ready for use they are most like an ordinary bed, and when closed or not in use they exhibit all the ornamentation and finish of a superior cabinet. Economy of space and appearance are not their only merits, for besides these advantages they are moderate in price. Another piece of furniture manufactured by the patentees of the "Champion" folding bed is a reservoir washstand in the form of a writing desk. When not in use this washstand has every appearance of a well finished and handsome desk, and is useful for that purpose. The washstand is a fit adjunct to the folding bed. The same company have some other novel and useful articles of house furniture which we may notice at another time.

Another description of folding beds, known as the "Burr," is designed to be serviceable for other than sleeping purposes. For instance, besides the ordinary cabinet bed, the "Burr" Company make the wardrobe bed, with a mirror 20 inches by 52 inches; the bookcase bed, with three drawers, three mirrors, and bookcase top; the buffet bed, with a sideboard top and shelves; and the desk bed, all of which are extremely elegant.

In designs for refrigerators American makes are fast leaving the beaten track. In all hot countries it has become a necessity to plan means for keeping articles of food in a fresh and cool state, and being themselves the inhabitants of a portion of the globe which is pretty hot in summer, the Americans have been compelled to combine experience with invention in this branch. Refrigerators are now in common household use in America, and they are not unknown on the railways, in the shape of specially constructed cars for the transport of produce, dead meat, fruit, etc. But we have to do at the present with small refrigerators for domestic use. These are the common chest refrigerators of the "Excelsior" pattern, suitable for the uses of a small household; the "Excelsior" and "Diamond" upright refrigerators with three or four shelves, the "Excelsior" double upright refrigerators of larger dimensions; beer refrigerators, and others too numerous to mention. With improved ice chambers, channels for the free current of air, etc., these refrigerators are now about as perfect as could be conceived. In South America, Australia, the Cape, and India, there ought to be an immense market for these goods.

The old fashioned three wheeled perambulator, which yielded *Punch* a rich harvest of jokes and cartoons, is not known in America; but, instead, the nursemaids and young mothers have the delight of driving out their charges in carriages of the most beautiful shape and finish. These baby carriages, the manufacture of which has become quite an industry in the States, are modeled upon the lines of the most exquisite Victorias or the neatest of broughams and phaetons. They are got up in the best possible manner, C and elliptic springs, electro-plated mountings, and the finest upholstery. All have four wheels, some with carriage tops, and others with adjustable sun shades. It is a pleasure to wheel these carriages, they are so light and handy, they satisfy the eye, and they give the young occupant ease and comfort. The baby carriage has been so largely adopted in the States that one seldom sees a child in arms now. Undoubtedly the very elegance and the comparative cheapness of these carriages will command a large demand for them out of the United States.

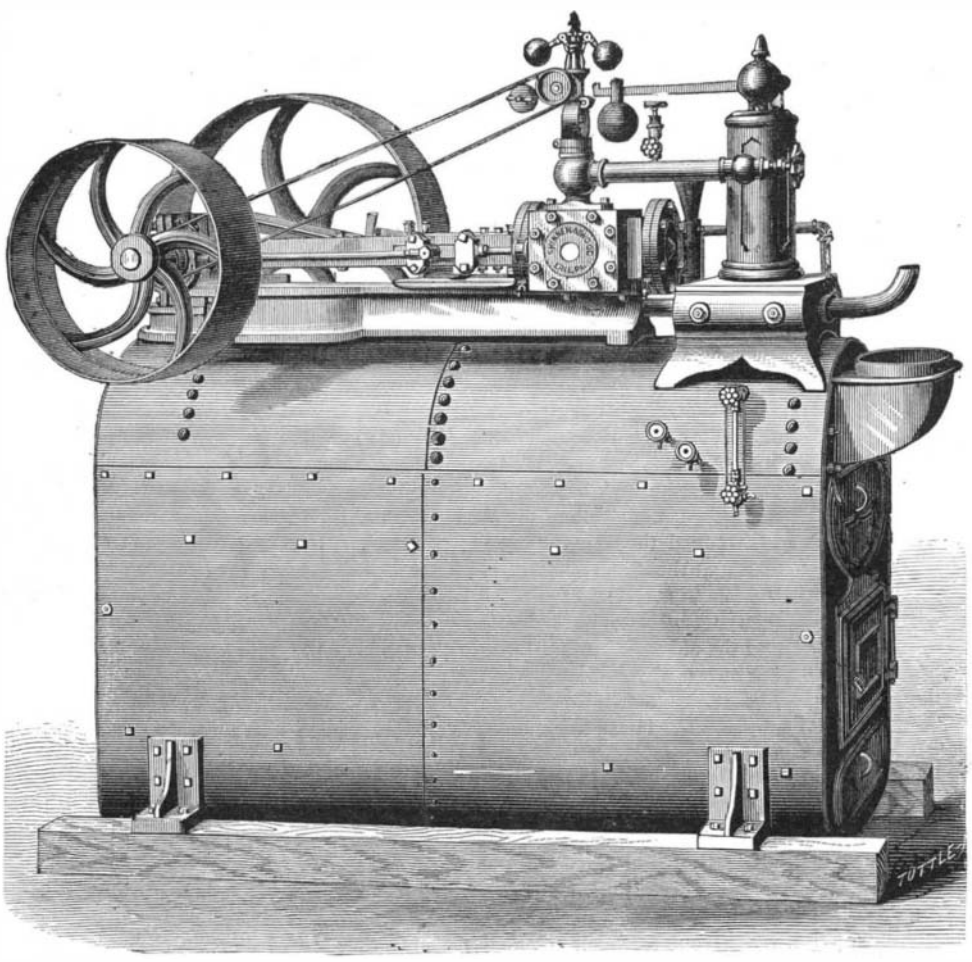
To write anything particularly new about the manufacture of boots and shoes by machinery would be difficult, because it must be pretty widely known that this trade has assumed enormous proportions in the Northeastern States.

So large has this industry become, it would not surprise many to learn that the home demand is too small for the production, and that the overplus must therefore find a market for itself in countries outside of North America.

These remarks, however, are beside our present intention; what we desire more especially to point out is the immense demand for steel shoe shanks or springs, for the making of boots and shoes. These shanks are cut by dies from sheet steel, into strips of about four and a half inches long and of various widths, which are placed on the instep between the leather. These give strength and elasticity to the shoe.

We know of three or four firms using in the aggregate about 1,500 tons of steel yearly in the manufacture of these shanks. Most of this steel comes from England.

We now refer to another kind of shoe—the horseshoe—and the very needful horseshoe nail. The rage for machinery in the States for all purposes, and the consequent education of the workmen up to the point of disliking the old form of manual labor, have made the introduction of machine-made horseshoes and nails an easy task. There are few blacksmiths now who do not prefer to use the ready-made article, which may be had of all shapes and sizes. Of course there is a saving in this, and the time



SKINNER & WOOD'S PORTABLE ENGINE.