

## 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  $2\frac{1}{2}$  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.

## 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 distributor, 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,

tured 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, electroplated 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.

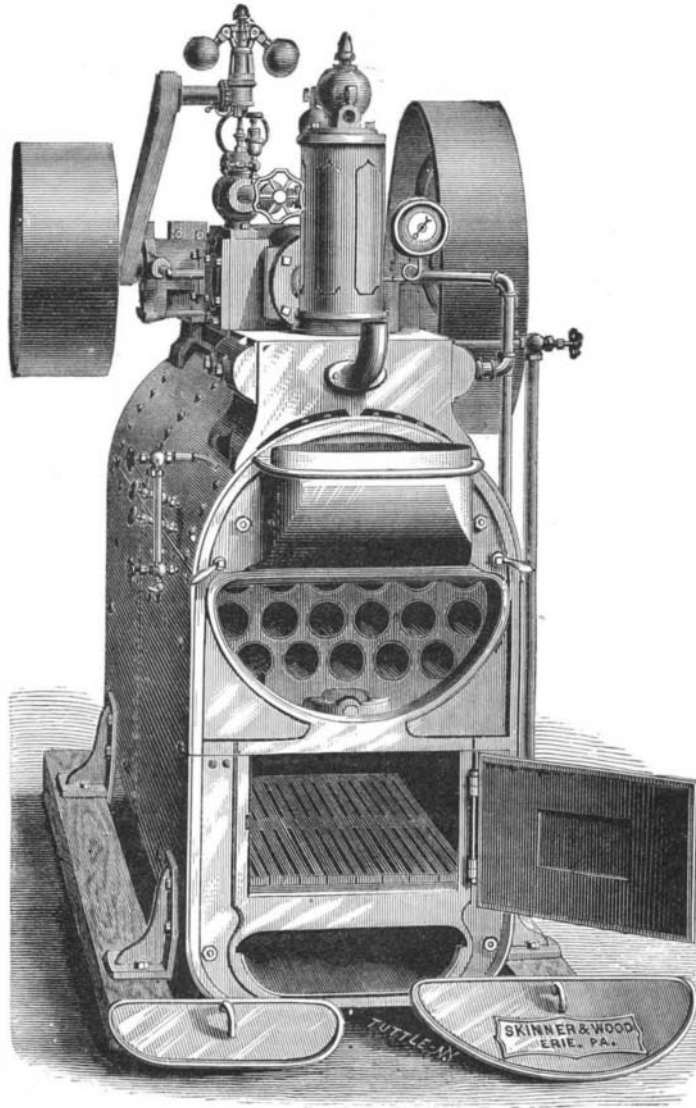
To write anything particularly new about the manufacture of boots and shoes by machinery would be difficult, because it must be pretty widely known that this trade has assumed enormous proportions in the Northeastern States.

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.

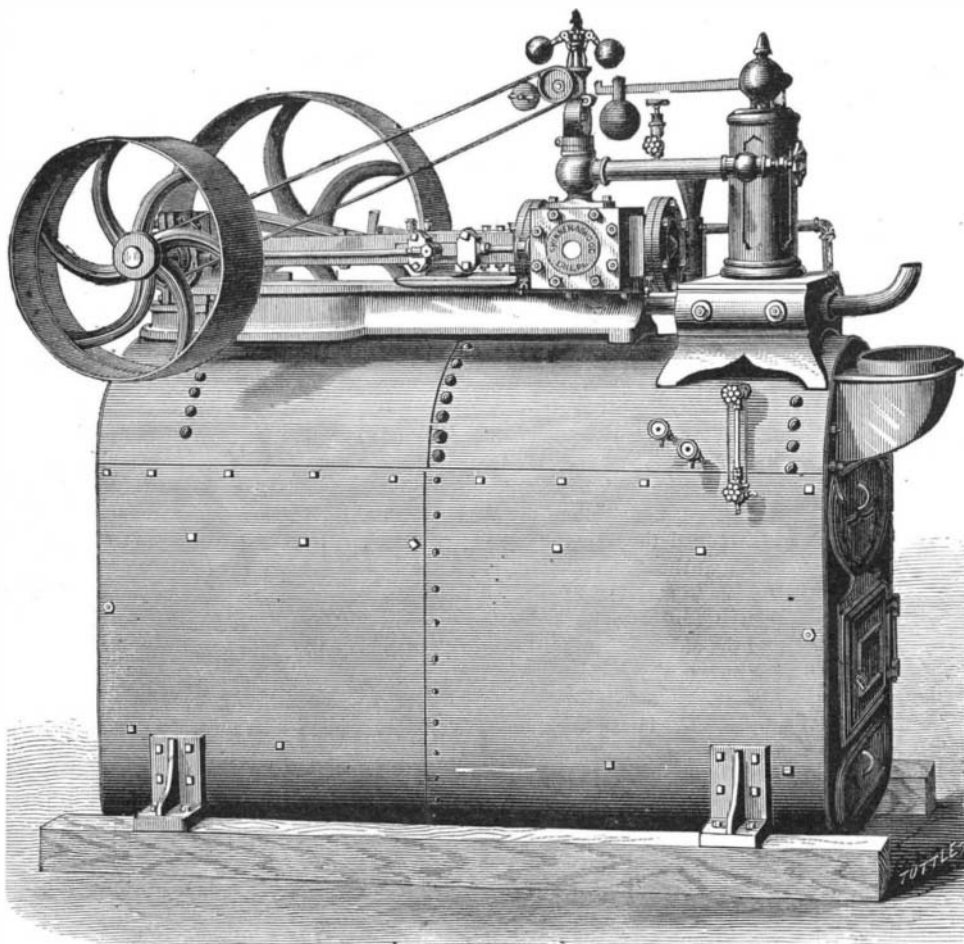
We know of three or four firms using in the aggregate about 1,500 tons of steel yearly in the manufacture of these shanks. Most of this steel comes from England.

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



PORTABLE ENGINE.—SIDE VIEW.

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 manufac-

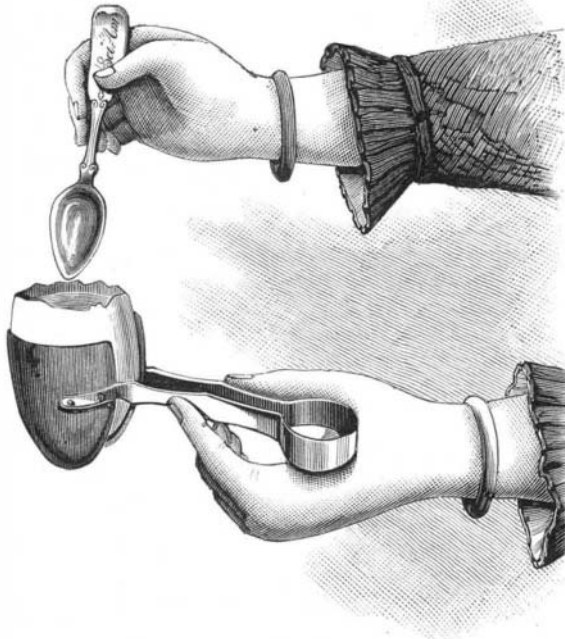


SKINNER &amp; WOOD'S PORTABLE ENGINE.

will come when none other but the machine-made goods may be had. The manufacturers, some of whom are named, are said to be now exporting largely, and thus in foreign markets they are cultivating the American liking and preference for these goods. This is not to be wondered at, because the quality, the appearance, the fit, are all they ought to be to win and keep customers.—*British Trade Journal.*

**NEW EGG TONGS.**

The annexed engraving represents a neat and inexpensive egg tongs recently patented by Mr. R. P. H. Koska, of East Saginaw, Mich. It is one of those devices that is likely to come into general use, as it is as simple as anything well



**KOSKA'S EGG TONGS.**

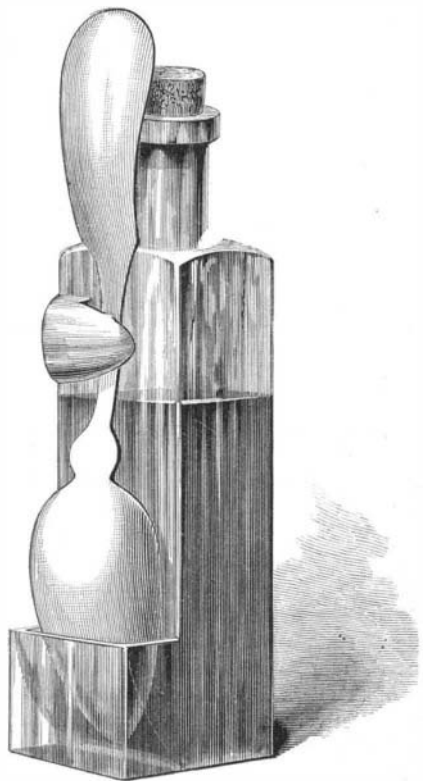
could be for the purpose; it forms a handsome article of table furniture, and will be of great utility, as eggs are now generally eaten soft boiled. This device does away with the egg cup and with inconvenience in handling and breaking the egg, and it affords a simple means of holding the shell while its contents are eaten with an egg spoon, the egg shell forming the cup.

The construction of the device will be readily understood from the engraving. The concave receptacles at the end of the spring handle are of such shape and size as to inclose something more than half of an egg. Each cup carries a small spur, which pierces the shell and assists in holding it.

Further information concerning this invention may be obtained from Mr. R. P. H. Koska, Bancroft House, East Saginaw, Mich.

**IMPROVED MEDICINE BOTTLE.**

The accompanying engraving shows an improved medicine bottle designed to receive and support the spoon used in taking the medicine.



**EARLE'S MEDICINE BOTTLE.**

The bottle has upon one side a socket or cup of suitable size and shape to receive the greater portion of the spoon bowl, and near the top of the bottle there is a clip for holding the spoon handle. This device is the invention of Mr. J. H. Earle, of Fall River, Mass.

**Engineers.—Their Value.**

Under this heading the *Boston Journal of Commerce* comments on the engineer who solves problems—not the man, adds the editor, who opens the throttle valve of a locomotive that goes racing over the track from one city to another, or of him who sets in motion one of the Corliss monsters that drives its thousands of spindles and looms or other machinery—but the civil engineer, who lays out the work that employs the others, deals either in one or the other of two separate and distinct realms—absolute fact or supposition. In the first he is often made to doubt his own sagacity and capability, for he must often change his course of action by reason of deductions drawn from experiment in which all his ideas of strength, elasticity, or economy have strangely departed. If he deals in the second he becomes, as too many have done, egotistical, and by very lack of knowledge or through force of circumstances, is constantly taking up untenable positions, making expensive, unsatisfactory and unsuccessful experiments—in other words, father of failures. Too much of this has been and is done. In many cases the parties are sooner or later involved in an outlay of thousands of dollars, and then comes the legitimate outgrowth of an attempt at the impossible—disagreement, disappointment, law suits, bitter feeling, loss of time, money, production, loss to every one involved; and yet it is a matter of every-day occurrence, and one which would have been avoided by the employment of a competent engineer for a day or two at the cost of fifty or a hundred dollars. Men who know nothing of proportion, strength, elasticity, pressure, torsion, volume, or density, get out an idea and patent it, or advise it and get it introduced, and then users get the effect by adoption.

Engineers are not always consistent, we had almost said not honest. They deal sometimes in vagaries or in elements of uncertainty without careful consideration or consultation of authorities who have preceded them, and give opinions or make out tables or results from preconceived ideas of matters to which they never give an hour's consideration in an honest, careful way. In this way they have in a measure detracted from their usefulness and the respect due them. Such a one, however, is always found out sooner or later, and finds his level. A man to do his work in a successful way should be careful in all his statements, and if he does not know a thing for a *sure thing*, say so, and not assume one thing or the other, for it is in engineering as with law—common sense is a pretty sure guide, and will lead you right a thousand times where it leads you wrong once.

In dealing with earth, iron, water, steel, steam, or any of the natural elements or created forces, we must remember that we are only capable, at least, of an approximation; that we must reason and investigate—and if we live to the extreme allotment of life, we are still learners. The profession has in the last decade done much to attract the attention and merit the admiration of men who never think deeply, clearly, or upon forces or matter other than to see results that are the outcome of close reasoning. There is too much of the superficial, too little of the real; to progress we must look closely at all elements, simple or compound; and when we have learned our own insignificance, we have commenced building upon a "bed rock" that does not "heave or settle."

**The Delaware Ship Canal.**

The surveys of routes for the proposed Chesapeake and Delaware Ship Canal were completed in December last. Six routes have now been estimated for, as shown in the following table:

No.	Name.	Length in miles.	Length of canal proper.	Cost in millions of dollars.	Relative time of transit in hours.	Saving in distance in miles.
1	Choptauk	149.81	37.67	16 1/2	19 1/4	175
1	Choptauk (inland)	138.91	30.00	18 1/4	18	186
2	Wye	128.42	42.99	26 1/2	17 1/2	196 1/2
3	Queenstown	107.29	53.78	37 1/4	17	217 1/4
4	Centreville	106.88	50.95	41 1/2	16 1/2	219
5	Southeast Creek	115.78	38.85	25	15 1/2	209 1/2
6	Sassafras	129.25	16.20	8	15 1/2	195 1/2

The lengths given are respectively from Baltimore to a common point at sea, twelve miles outside of the Delaware breakwater. The distance from Baltimore by the route now used to the same point is 325 miles, or 33 1/4 hours, allowing a speed of 10 miles in open water and 8 miles in dredged canals.

Mr. N. H. Hutton, under whom these surveys were made, reports that the Sassafras route is the shortest in time and the cheapest; but it has very expensive approaches to maintain and very serious conditions to be overcome if it is to be used during the winter. The Centreville and Queenstown routes are the most direct, rate second as to time, but cost largely in excess of other routes; have expensive approaches to maintain on the Chesapeake side, and are, as the Sassafras route, liable to obstruction by ice during the winter. The Choptauk route rates slightly below the Sassafras as to time of transit, and rates third in this respect, while it is second on the list in point of cost, its greatest advantages being in the matters of freedom from obstruction by ice and economy of maintenance of approaches.

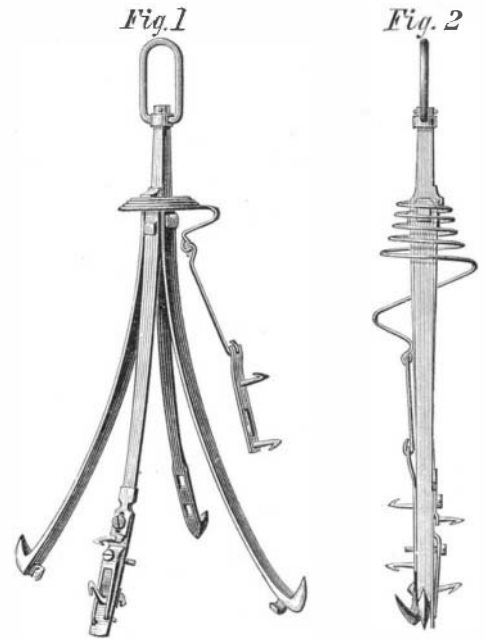
More recently Major W. P. Craighill, of the Engineer Corps, has made a new survey of the Sassafras route and estimates its cost at half a million dollars more than Mr. Hutton's estimate. Major Craighill's estimate is for a canal 100 feet wide on the bottom, 26 feet below low water, side slopes

one and one-half to one, with a berme on one side 12 feet wide and 30 feet above the bottom.

The other estimates are for a canal 100 feet wide at the bottom, 26 feet below low water. The width is to be 178 feet at low water; the locks to have chambers 600 feet long and 60 feet wide; tide locks only to be built, and these will probably be generally open and only exceptionally used.

**IMPROVED ANIMAL TRAP.**

The annexed engraving represents a novel animal trap, recently patented by Mr. William J. Taber, of Lookout Station, Wyoming Ter. It is especially intended for catching bears, wolves, and other large animals, and it consists of four curved spring bars provided with hooks, and having a catch and trigger which hold them together when the trap is set, as shown in Fig. 2.



**TABER'S ANIMAL TRAP.**

Fig. 1 represents the trap after it is sprung. In setting the trap the outer ends of the spring bars are pressed together and held in place by the catch or trigger. The latter is engaged by a bait plate connected with the spiral spring at the top of the trap. The bait is attached to this plate, and when the animal seizes it, the trigger is disengaged and the curved bars spring outward, thrusting the hooks into the sides of the animal's mouth.

The inventor states that the barbs or points cut the mouth of the animal so that it soon bleeds to death.

**IMPROVEMENT IN JUGS.**

A stone jug is almost the last thing we would expect to see improved, and yet our engraving shows an improvement in this article which possesses the merit of being both simple and efficient. It consists of a passage or vent formed lengthwise in the handle, commencing inside the jug and terminating near the mouth of the jug. In filling the jug air is permitted to escape through this vent, thus allowing the liquid to enter the jug with greater rapidity than it



**IMPROVED JUG.**

otherwise would, and in pouring the contents from the jug, air enters the vent and fills the space as the liquid escapes.

This invention was recently patented by Mr. Samuel A. Conrad, of Terre Haute, Ind.

This has been a bad winter for fur dealers, sleigh makers, ice monopolists, and coal retailers in New York and vicinity.