

and that which brings the fruit to perfection through the "lateral roots" now, where there is a vigorous growth of leaves and no fruit, it is evident that there is some defect in the furnishing quality of the lateral roots, the saproot giving a superabundance of sap. This can be obviated thus: Let the farmer dig a trench (commencing some six or eight feet from the tree in order that the lateral roots may receive no injuries) deep enough to enable him to strike the "tap root" some three or four inches from its junction with the main portion of the tree. Cut this with a saw or sharp knife, fill up the excavation and the good effects will be seen the following season. This should be done before the sap rises.

READER.

Richmond, Va.

**Philosophy of Preserving Eggs.**

Messrs. Editors.—Cobbet says, "A preserved egg need be run from, than after." The thousands and one recipes given from time to time are in fact as worthless as the mermaid stories or those of the snake monster of the sea. Many who put forth these stories for the million do not know what a fresh egg is; many do it for notoriety, and some ignorantly. No egg is fresh that will shake; this is because it has lost some of its albumen. No egg has ever been preserved over a month that will not shake, except it be air-proofed, which is a term not generally understood, and is a new process. If they are put in solution, no matter what it is, the egg will absorb it; if put up in dry measures the albumen will escape by transpiration through the shell. The egg has been coated with every conceivable composition, even in solid stone, and galvanized, yet the watery material escapes. The philosophy of this is that there is air in the egg before it is treated, and this uniting its oxygen and carbon, produces decomposition by carbonic acid gas, the yellow of the egg first breaking, then follows the destruction. Eggs are naturally designed to last as long as the hen requires to get her brood, and the life germ can be preserved a few weeks—seven or eight—but no longer. The egg itself may be kept in a preserved state for two years by greasing with butter, oil, or lard, but from the time it is thus put up to the end of two years it will daily lose its albumen by transpiration, and while its carbonic acid escapes to a certain extent, the egg meat will be reduced fully two thirds, and will shake. For culinary purposes they will do very well. But we want a whole egg, not a half one, and we want them fresh. Butter and lard and suet have been used for half a century, still nothing has recommended itself over the old liming system in a commercial point of view. The theory always has been, and still is, that to keep an egg fresh the air must be excluded. It is the only philosophical treatment of it that can be made. Eggs are composed of more than half a dozen chemical ingredients, and these components are very volatile; hence the atmosphere with its powerful agencies works quickly upon it. Externally kept from the air, the latter is powerless to do it harm, but the air inside no mortal can prevent, and that alone in time will decompose the egg.

AN EGG STUDENT FOR FIFTEEN YEARS.

New York city.

**To Make Castings Free from Scoriae.**

Messrs. Editors.—Your correspondent, J. C. W., in No. 6 current series, page 87 speaks of his difficulty in getting sound castings. Has he ever tried a "stodge catcher," which is nothing more than a large sprue set in front of the pouring sprue and gated heavy from one to the other? It should be gated not quite so heavy from under the stodge catcher to the casting in the nowell. Then by pouring fast enough to keep the iron well up in the stodge catcher the scoriae that goes into the pouring sprue will rise and stay in the catcher.

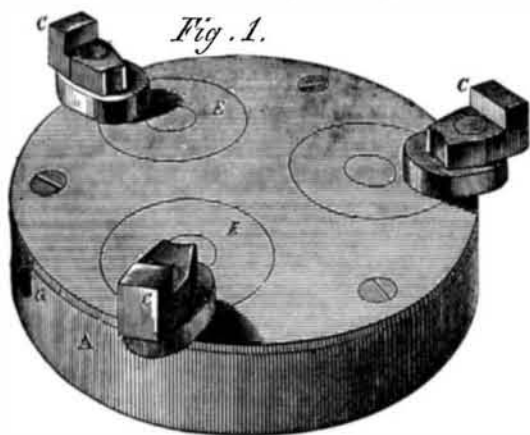
Iron should be poured hot, whether in dry or green sand molds; I consider it a great mistake to let iron cool in the ladle. If the mold is just right the iron can hardly be too hot. When the iron is poured hot the stodge rises, but if it is cooled down to the point many molders prefer, the scoriae catches on the sides of the mold and make an unsound casting.

JOHN K. RICHARDS.

New York.

**JOHNSON'S UNIVERSAL LATHE CHUCK.**

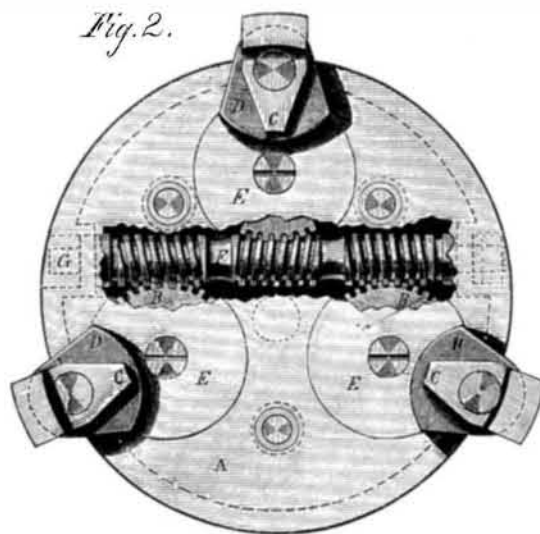
A good universal lathe chuck, one strong, durable, not easily got out of repair, or so choked up with chips and dirt as to



be impossible to use without consuming more time than would take to do the job, would be, as every machinist knows, an invaluable tool in the machine shop; but, as most machinists have experienced, one very difficult to obtain. This has confined the use of universal chucks to small work which could not well be done otherwise, and has led to the use of a less economical class of chucks as a substitute for holding larger work. The chuck here illustrated is upon a new prin-

ciple. has been most thoroughly and severely tested, and the patentee says, has proved itself perfect to do the work for which it is designed.

A socket wrench applied to the end of the worm shaft revolves the arms carrying the jaws, to and from the center grasping the work with the utmost precision and holding it firmly as in a vise.



The superiority of this chuck consists, briefly, 1st, in its entire freedom from dirt, and impossibility of chips or dirt getting to the working parts of the chuck; 2d, the simplicity of its construction renders it less liable to get out of repair than other; 3d, its accuracy strength and durability; 4th, the jaws, being simple in form, extra jaws for holding odd jobs of peculiar form or shape can be quickly made at a trifling expense.

A brief description and reference to the parts may aid in an understanding of its construction and operation: Fig. 1 is a perspective view of the chuck as ready for use; Fig. 2 is a view with a portion of the face broken away, exposing the right and left hand screw or worm and the worm segments; and Fig. 3 is a cross section through worm segment, chuck, and jaw. A is the body of the chuck; B, segments of worm gears having teeth around about six tenths of their circumferences; C are steel jaws pivoted to the projections, D, on the plates, E, which are rigidly a portion of the worm wheel segments and rotate with them; F is the worm shaft which engages with the gears and is turned by a socket wrench inserted at G, Figs. 1 and 2.

As the worm shaft is rotated by the wrench, it revolves the gears so as to bring the jaws either to or from the center. These jaws can be easily adjusted to receive objects of an irregular form, or they can be used as are those on the scroll chuck for the reception of regular shapes.

Patented by William Johnson, and manufactured by Cowin and Johnson, Lambertville, N. J., to whom all orders should be addressed. Responsible agents are wanted in all the principal towns in the United States.

**The Central American States.**

That portion of the continent lying between North and South America proper, known as Central America is becoming of political and commercial interest to the people of this country, and, because of its presenting the most favorable routes between the two oceans, to the nations of Europe. The following from the *Hartford Courant* will be read with interest:—

The large profits of the Panama railroad revive every now and then certain old projects for the construction of another railroad or the canalization of Central America. There can be no doubt that had the people of the region which lies between Mexico and South America been possessed of ordinary commercial activity, two or three well traveled routes would ere this have been opened from ocean to ocean. But like the inhabitants of other portions of Spanish America, they have been too busy with revolutions and political squabbles to find any time or energy to devote to industry or trade. The five Central American republics all achieved their independence about 1821, and in 1823 formed themselves into a confederation, which lasted until 1839, when it fell to pieces and all the members set themselves up as independent powers. The largest one is Nicaragua, which is about the same size as Georgia; its capital is Managua, with ten thousand inhabitants; its total population is about four hundred thousand, of whom thirty thousand are whites, ten thousand negroes, and the remainder Indians and half-breeds. The next in size is Honduras, having about the same area as Mississippi; its capital, Comayagua, has eighteen thousand inhabitants; its total population is about three hundred and fifty thousand souls. Guatemala is the third of the Central American republics, being a little larger than Ohio; the name of its capital is also Guatemala, with forty thousand inhabitants; the total population is estimated at one million and one hundred thousand, or greater than that of all the isthmian powers together. Costa Rica is the next in size, its area being somewhat more extended than that of West Virginia; its capital, San Jose, contains thirty thousand souls; its total population is one hundred and twenty thousand. The smallest of these

powers is San Salvador, which does not cover quite as much ground as Massachusetts; its capital is also styled San Salvador, and its inhabitants number perhaps fifteen thousand; the whole population is believed to reach six hundred thousand. The existing constitution of Nicaragua was adopted in 1858, of Honduras in 1865, and of Guatemala in 1847. The presidents of all the republics serve four years—unless they are overthrown by a revolution—except the executive of Costa Rica, whose term of service is three years. The term Central America is generally considered to include, besides the five republics, the state of Yucatan, in Mexico, and the state of Panama in Colombia.

**SHEA'S PATENT BARREL AND TANK.**

The demand for kegs, barrels, pipes, and tanks is constantly increasing. They are the most convenient vehicles for the conveyance of liquids and many solid materials from place to place, and upon their proper construction depends largely the amount and the condition of the material they hold upon their arrival at the place of destination. The engravings exhibit a new method of constructing barrels, tanks, etc., patented January 29, 1867. Fig. 1 presents a view of a barrel partly in section; Fig. 2 is an end view of the staves of the barrel, and Fig. 3 is a cross section of the improved head. This improvement consists in forming a V-shaped encircling projection, A, upon the edge of the head, leaving a shoulder above and below. It will be seen that when the head is seated in the barrel it forms shoulders above and below the croze, bearing against the chimes and preventing them from being broken. The incline of the edge of the head also gives additional security, as the greater the internal pressure the closer will be the fit of the head to the staves.

Fig. 2 shows a new method of securing the staves one to the other. B represents metallic dowels, slightly curved, to correspond to the curvature of the cask, and feathered at each

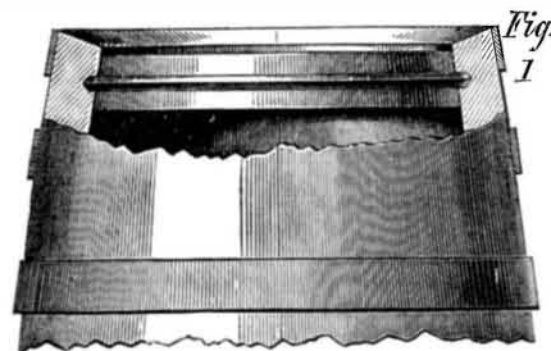
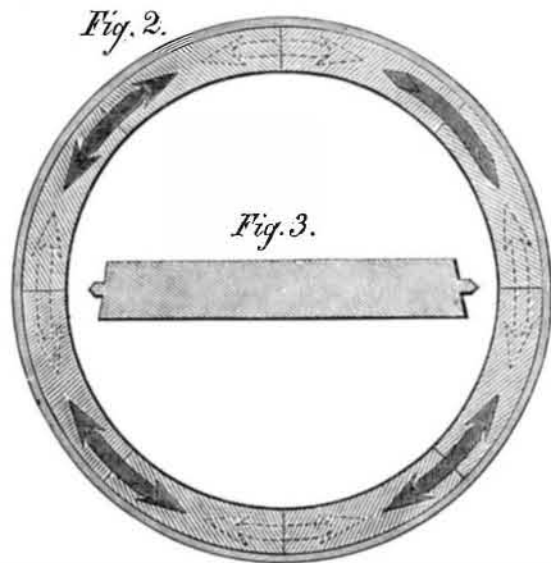


Fig. 2.



end. These are driven into suitable recesses in the ends of the staves, thus firmly binding them together. Fewer hoops are required for barrels thus built than for others.

The use of this dowel is particularly applicable to heavy work. The inventor says that, casks made in this way will cost no more than others, require less labor, and will overcome all the disadvantages of the present style of construction. A factory is now being built in New York for the manufacture of casks under this patent, having already very large orders ahead from brewers, distillers, oil merchants, and sugar refiners, who, through their patronage have given substantial evidence of their appreciation of the improvement.

The patentee will sell manufacturing and territorial rights and will furnish the necessary machinery for the manufacture of these improvements, or will alter any now in use at a moderate cost. Address Samuel Shea, Corry, Erie county, Pa., or at Jersey City, N. J., or H. W. Quitzow, 24 South William street, New York city.

SETH GREEN, Holyoke, Mass., writes to the New York Farmer's Club that he is hatching shad by the million, artificially, and he wants to say to everybody that he will give them all the young shad and impregnated ovas that they will come and take away. The day before writing he hatched 5,000,000.

PARISIAN TASTE is rather an indefinable sense. The Chinese have never been accused of over fastidiousness in the selection of their food, but what with horse flesh, frogs, snails, and so on to the end of the chapter, the same may soon be said of this more favored Western nation. The latest delicacy introduced in Paris is whale's flesh, and shark and dolphin steaks.