

IMPROVED NUT ARBOR.

The useful tool shown in the engraving consists of a rod with centers in the ends to fit in the lathe centers, and a sleeve surrounding the rod the greater portion of its length, the rod and sleeve each having part of the screw threads upon which the nuts to be faced are screwed. The threads of one part may be shifted with respect to the threads of the other part after the nut is screwed on, so that one will check against the other, and thus hold the nuts to be faced by the threads alone. This will insure the facing of nuts true to the screw threads, and will avoid the imperfect work that results from the sides of the nuts being screwed against a shoulder of the mandrel when not true to be-gin with. This invention has been patented by Mr. Patrick Duffy, of New Bedford, Mass.

Have Fishes Intelligence?

Dr. C. C. Abbott discusses in *Science* Mr. Romaine's opinion in regard to the intelligence of fish, where, in his "Animal Intelligence," he writes: "Neither in its instincts nor in general intelligence can any fish be compared with an ant or a bee."

Dr. Abbott thinks the words "any fish" open to discussion, and believes that "some fish" would be less open to criticism. Dr. Abbott cites the case of pickerel in a shallow stream, threatened by a net. One fish was caught. Then the others halted. Some sprang over the cork line, others made their way between the brail and the net, while others hurried in the sand at the bottom and so worked their way under and out of the neck. The same authority cites the evidences of intelligence in the sunfish, the *Eupomotis aureus*. These fish pair, and the same fish live together for years. The same thing as to pairing and caring for their young happens with the black bass. But the last case cited by Dr. Abbott is at the least very remarkable as showing affection in fish, and consequently highly developed intelligence.

Having removed a brood of catfish (*Amiurus catus*) from their mother, the young progeny were put in a glass globe. "The parent fish at once recognized that her young were not in the creek, although they were swimming in water. . . . At last its curiosity overcame its discretion, and it left the creek, and as best it could made its way to the base of the globe containing her young, a distance of about two feet." The young fish being liberated, "they immediately clustered about their parent, and followed her into deep water." Capt John H. Mortimer is authority for the fact of the concerted action of certain predatory sea fish, who maneuver as would a pack of hounds to secure their prey.

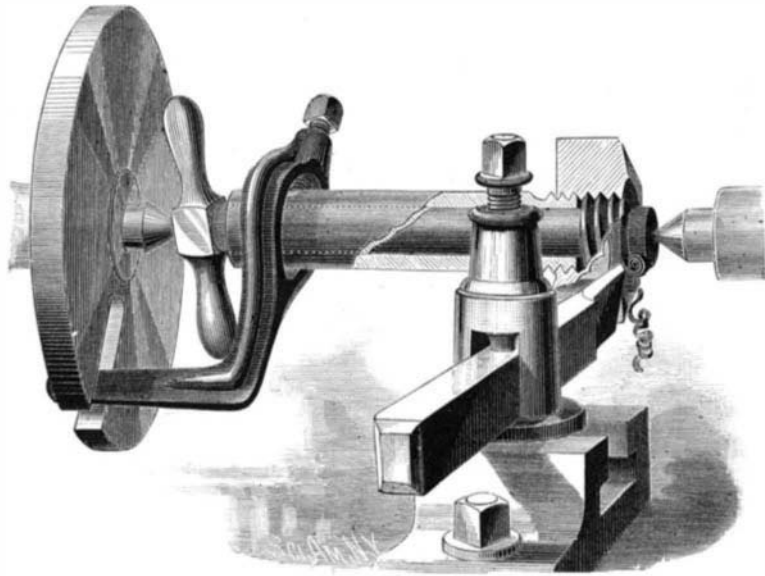
Spearing for Timber.

A new industry has recently been developed in Ireland—a sort of timber prospecting never dreamed of by our American pine hunters. It is a well known geological fact, says the *North-western Lumberman*, that immense tracts what are now bog lands in Ireland were once covered with forests of oak and pine, and that in cutting peat, immense trees of these varieties are found embedded in the earth at depths of ten, twenty, and thirty feet, in many cases whole groves being found standing just as they grew. To find out the location of these miniature subterranean forests is now the speculative work in which some industrious Irishmen are engaged. The timber, when brought to the surface, is found to be perfectly sound, and the oak, which is as black as ebony, is used extensively for ornaments of jewelry and fancy cabinet work, and sells at high prices. A recent visitor to the wild moor and mountain region of Donegal thus describes the way in which the seekers after hurried forests operate. Two men, armed with steel rods about thirty feet long, traverse the bog, and by running their rods into the ground are able to ascertain where the trees are to be found. They work by what may be termed natural mathematics, and quickly determine the length of their prize, its approximate diameter, whether it is pine or oak, and is or is not a clumper—one of a company or clump. They fix on twenty or thirty feet square, and cross it with their searchers, say north and south, and then east and west, search it across each way, a stab to each foot or so, and in the course of a few minutes they know whether that area contains what they are looking for. The square lying next and next, and all near each other, are so searched, and the discoveries, if any, marked for future action. The unproductive are also marked, to avoid future loss of labor.

The white perch of the Ohio are noted for the musical sounds they make. The sound is much like that produced by a silk thread placed in a window where the wind blows across it.

English Parcel Post.

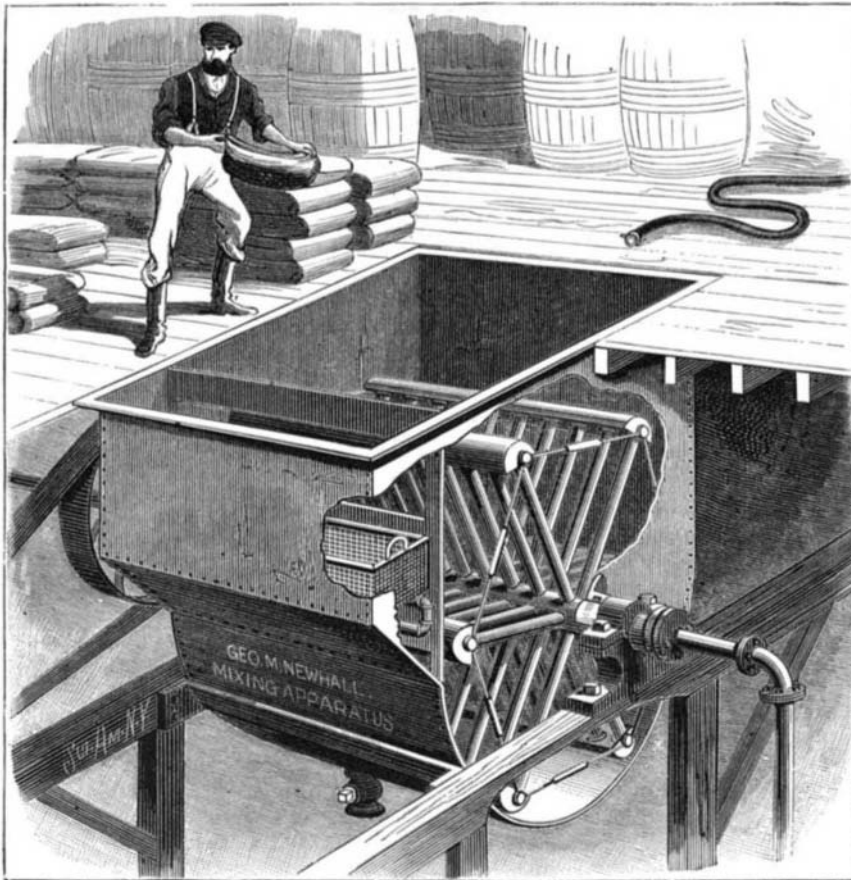
The latest popular improvement introduced into the British postal system is to come into operation on August 1 next, under the following general conditions in regard to weights, dimensions, and rates of postage, viz.: Weights and postage: For an inland postal parcel of a weight of not exceeding 1 pound the rate of postage, to be prepaid in ordinary postage stamps, will be 3d.; exceeding 1 pound, and not exceeding 3 pounds, 6d.; exceeding 3 pounds, and not exceeding 5 pounds, 9d.; exceeding 5 pounds, and not exceeding 7 pounds, 1s. Dimensions: The dimensions allowed for an inland postal parcel will be—

**DUFFY'S NUT ARBOR.**

maximum length, 3 feet 6 inches; maximum length and girth combined, 6 feet. Examples: A parcel measuring 3 feet 6 inches in its longest dimensions may measure as much as 2 feet 6 inches in girth, *i. e.*, around its thickest part; or a shorter parcel may be thicker, *e. g.*, if measuring no more than 3 feet in length it may measure as much as 3 feet in girth, *s. e.*, around its thickest part.

NEW APPARATUS FOR STIRRING, MIXING, AND MELTING.

The stirrer in this apparatus is composed principally of steam heated tubes arranged to thoroughly mix the materials while maintaining them at a uniform temperature. A tubular shaft, concentric with the base of the vessel, extends through the vessel, and is provided with a pulley by which it is driven. A series of tubes radiate from the tubular shaft, there being in the present instance six rows of these tubes and ten tubes in each row; but the number of sets of tubes and the number of tubes in each set may be varied to

**NEWHALL'S APPARATUS FOR STIRRING, MIXING, AND MELTING SUGAR, ETC.**

suit requirements. The tubes of each row are closed at their outer ends, and a hollow bar or hood extends across the ends of each row of tubes, the several hoods being connected together by rods which render the stirrer rigid.

A stationary pipe communicating at one end with any neighboring steam generator, and at the opposite end with a suitable discharge pipe, passes through stuffing boxes at the ends of the tubular shaft. A portion of this pipe, which extends into the tubular shaft, is open at the top, so as to form a trough. At one end of the vessel, and communicat-

ing therewith, is a receptacle which contains a removable basket made of wire gauze or netting, and supported on ledges in the receptacle; the bottom of the wire gauze vessel is inclined to the lower edge of the opening. There are beneath the basket steam heated pipes. While the above described apparatus may be used for obtaining solutions of salts and other crystalline substances and for dissolving gummy or resinous substances—as, for instance, in the manufacture of varnish and for thoroughly mixing liquids—it has been more especially designed for obtaining saccharine solutions.

The crude sugar, which always contains more or less insoluble foreign matter—such as sand, mud, and chips of cane—is placed with a supply of water in the vessel, and the stirrer is revolved from the bottom upward toward the wire gauze basket.

All parts of the mass are maintained at the same temperature and density by the steam heated stirrer, which revolves as close as possible to the bottom of the vessel without coming into actual contact therewith. There must necessarily be a persistent current of the contents of the vessel in the direction of rotation, and this, together with the movement of the crossbars or hoods of the stirrer so near to the bottom of the vessel, prevents the accumulation of sediment therein.

As the stirrer is rotated the particles of insoluble foreign matter are carried upward, and have a tendency to pass the side receptacle, where they are caught by the basket, accompanied with more or less of the solution, which is drained off from the basket, and returns to the main vessel through the opening below. More or less undissolved sugar will also find its way into the basket; hence the

steam pipes below, the heat imparted at this point, together with the "wash" or eddy of sirup caused at intervals to pass through the opening as the stirrer revolves, tends to dissolve the sugar trapped in the basket.

When a thorough solution, free, or nearly so, from foreign matter has been obtained, the rotation of the stirrer is discontinued, the contents of the vessel drawn off, and the basket is emptied and cleaned. As the stirrer revolves, whatever water of condensation may be in the tubes will be discharged into the trough and pass off with the waste steam. This apparatus is capable of doing its work at almost any rate of speed, depending on the pressure and temperature of the steam and upon the speed of the stirrer. If desired, fluids may be used in the pipes for either heating or cooling.

The contents of the vessel can be held at the temperature of melting, by keeping steam on and stopping the stirrer. The upper portion alone is subjected to the extra heating; as the lower pipes soon fill with water, cooling occurs mostly from the surface, and in this apparatus it is not necessary to overheat the lower section in order to maintain the temperature of the upper.

The movement of the heating surface prevents the damage often caused in other melters by the mass of undissolved material lying upon the heating pipes previous to solution. It is well known that melting with "live steam" injected through perforated pipes, etc., leads to a dilution of the solution which is not always desired. Besides, one cannot well melt with very weak steam, as pressure is required to force against the pressure of the semi-fluid mass. This is considerable in deep vessels, which are the *quickest melters* with open steam.

Steam coil melters cumber up the lower portions of the melter, and are very unhandy to keep clean. They are expensive, rather ineffective, and often injurious to the substance treated. In this new melter and stirrer all these difficulties are avoided, and the work is perfectly and economically done. Further information in regard to this invention may be obtained by addressing the inventor, Mr. George M. Newhall, 225 Church Street, Philadelphia, Pa.

Singular Effect of Corrosive Sublimate.

A singular effect of corrosive sublimate, first observed by Salkowski, has recently been confirmed by Prevost and Trutiger, of Geneva (*Lancet*, April 14, p. 640). They have found that it causes the lime to be removed from the bones to the extent of

2 to 4 or sometimes 8 to 10 per cent, and to be deposited in the cortical substance of the kidneys, so that the kidneys appear almost as if petrified, while the bones, at least in the case of rabbits, become so altered that the epiphyses of the long bones are at length movable on the shaft. This decalcification takes place to the greatest extent when the doses of the poison are such as to cause death in three or four days.

It is asserted that British capital to the extent of thirty millions went into Wyoming and Texas last year.