

**IMPROVED STEAM PACKING.**

The sectional packing shown in the annexed engraving is designed for the stuffing boxes of steam cylinders, pumps, air chambers, etc. The metallic packing rings, *g*, have their adjoining faces inclined in opposite directions, so that the pressure of the gland will contract and expand alternate rings, and thus pack the stuffing box and the piston rod. These packing rings are used in connection with a conical sleeve, *A*, contained by the box and surrounding the piston rod. This sleeve is divided longitudinally into two equal parts, *a*, and into two small wedge-shaped pieces which lie between the ends of the larger portions. The ring is separated into sections in this manner to facilitate the removal of the ring from the stuffing box. Two semicircular pieces, *d*, are placed at the bottom of the stuffing box to adapt the ring, *A*, to the box. Grooves, *e*, are made in the ring, *A*, *d*, to receive some of the water of condensation, which prevents overheating the packing.

Part of the rings, *g*, are beveled to adapt them to the inner surface of the ring, *A*. It will be noticed that when the gland is tightened up, the rings, *g*, when pressed, move alternately in opposite directions; that is, the first ring presses the piston rod, the second one presses the inner surface of the stuffing box, and so on.

The inventor claims that the packing remains tight, wears smoothly and evenly, and does away with a great deal of friction which is unavoidable in other methods of packing, and he furnishes a list of prominent mining companies and mill owners in the mining regions of the Southwest, who indorse it and are using it with entire satisfaction.

Further particulars may be obtained from the inventor, Mr. George C. Phillips, of Silver City, Nevada.

**PROA LADRONIA.**

This boat was built on Cayuga Lake, N. Y., 1877, for T. M. Prentiss, Boston, Mass. (Named for the Ladrone Islands, where the "Flying Proa" originated.)

**CONSTRUCTION.—HULLS.**

Two half sections of a boat—closed.

*Inner Sides.*—Smooth and straight from end to end.

*Upper Sides.*—Flat and at right angles with inner sides.

*Outer Sides.*—Modeled with as much attention given to lines as for a single boat, gaining thereby greater bulk and buoyancy than is possible in straight-sided round tubes or simply boat-shaped pontoons; immense reserve of floating power being essential in a double boat to prevent the leeward hull from being submerged in rough weather.

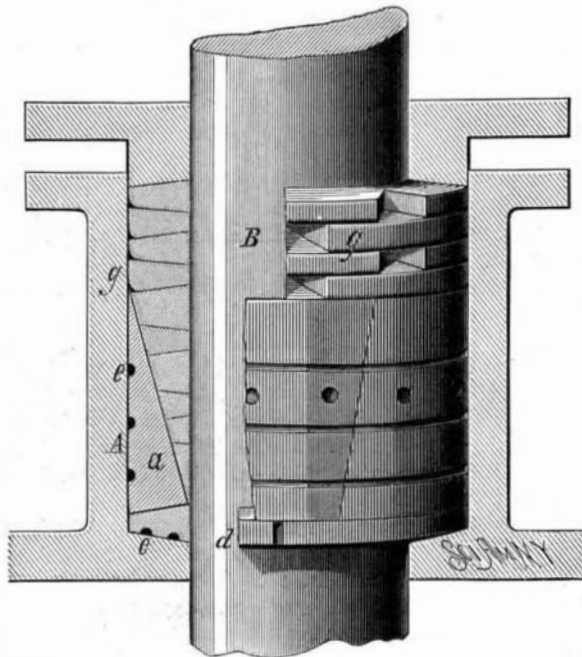
Ribs of hulls are of oak, covered with  $\frac{3}{4}$  inch pine. Length of hulls over all, 17 feet; width, upper sides, amidships, 18 inches; depth, inner or flat sides, amidships, 20 inches; depth at bow, 29 inches; depth at stern, 24 inches. The hulls are placed 5 feet apart, and connected together by six transverse beams, each 3 inches square, firmly bolted and riveted, alike to the inner and outer sides of hulls.

Each hull is provided with a  $2\frac{1}{2}$ -inch brass-deck-screw for

the purpose of pumping out. As yet there has been no occasion to use a pump.

**DECK.**

The deck or platform—laid in alternate strips of butternut and pine,  $\frac{3}{4}$  inch thick and matched—is semicircular in shape at the bow and stern. Extreme length of deck, 15 feet; extreme width of deck,  $8\frac{1}{2}$  feet. The under surface of deck is sheathed and painted, to prevent any resistance of

**PHILLIPS' STEAM PACKING.**

the cross beams to the passage of water between the two hulls.

Railing of oak—2 feet high—round the deck, having a base board 4 inches wide, and top board 2 inches wide. Intervening space—18 inches—of rope netting, painted red and white.

**BULWARKS.**

Painted oilcloth, wound round two spring window shade rollers placed perpendicularly inside a close fitting black walnut case, serves for bulwarks to protect against spray when beating to windward in rough weather.

*The Mast.*—21 feet; is stepped 5 feet from bows, midway between the hulls. It is square at the foot, where it is made to slip easily into and out of a black walnut box, 18 inches deep. The latter is mortised to one of the deck beams (second one from the bows), and supported by four iron braces riveted to three of the beams, placed nearer together for that purpose when laid than the three aft beams.

**RIGGING.**

Length of boom, 21 feet; length of yard, 24 feet. Four blocks only are used, three of them single and one double.

*The Sail.*—Pattern, modified lateen; dimensions,  $28\frac{1}{2}$  square yards. Is hoisted by a single halyard, by which alone it is held to the mast above; and below by a stout wooden hoop attached to the boom where it crosses the mast—say 5 feet from the deck—thereby insuring ample head-room, and allowing the sail to veer with the wind as freely as a weathercock, which is particularly advantageous in heavy flaws, as it obviates the necessity of luffing to avoid unusual strain upon mast or rigging.

**PERFORMANCE.**

Capsizing seems to be an impossibility with this craft. So great is her stability that the mast and entire rigging have been blown overboard without so much as stirring a campchair on deck.

Gibing may be simply denominated one of her most innocent performances.

Being wonderfully steady under canvas, by reason of her double construction, she is wholly independent of ballast.

The flat side of the windward boat always acts as a center-board; and both hulls being closed against the ingress of water, she never requires bailing. Any water she may ship discharges itself at once without doing any harm. Her weight is about 1,500 pounds, and she draws 6 inches of water.

She sails and steers well on all points, and will lay closer to the wind than most ordinary boats, owing probably to the two keels, which give a double hold on the water. On this is largely dependent the ease with which the Ladronea may be put about.

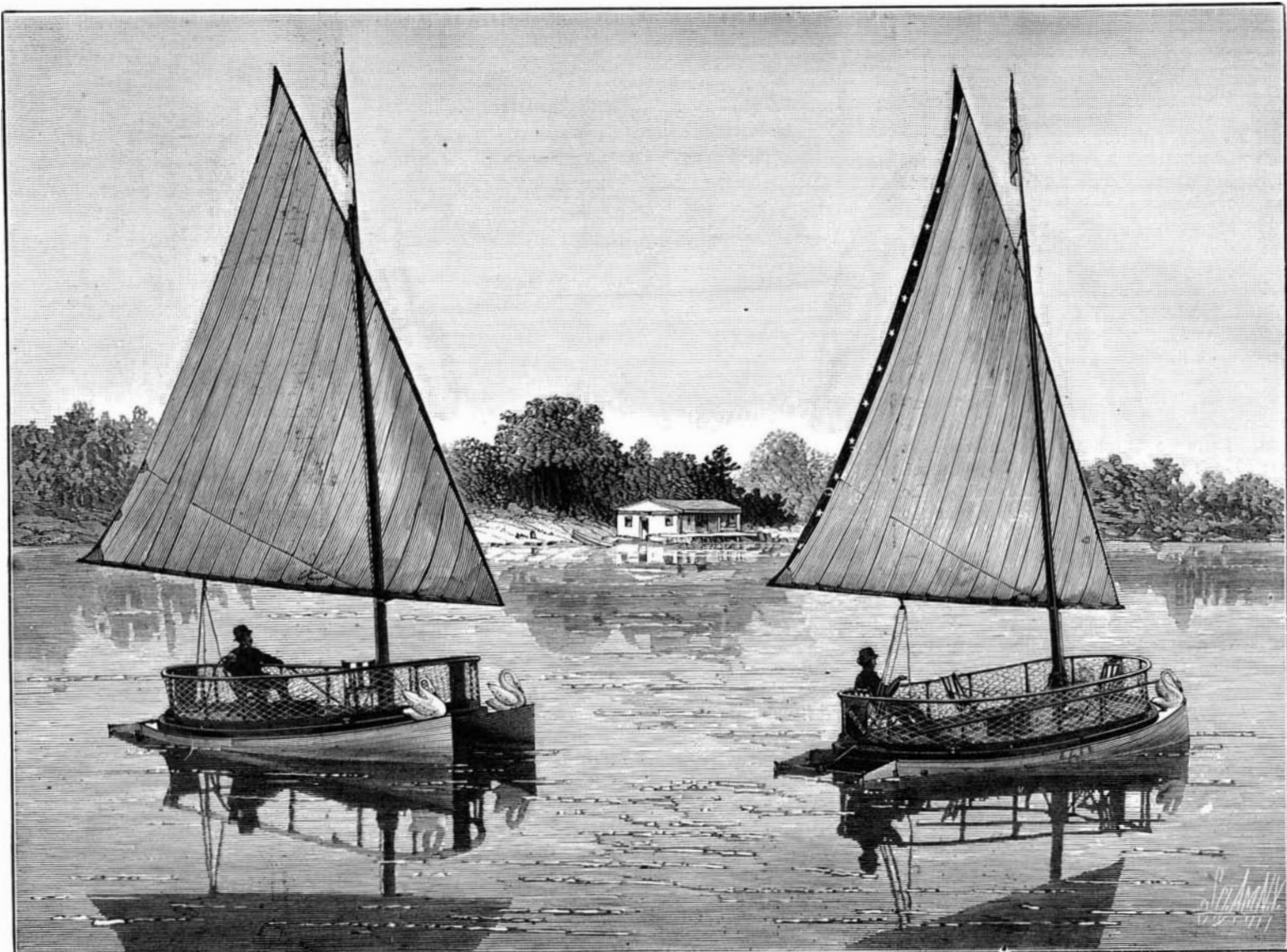
With skillful management of the helm, while close to the wind, she rarely misses stays. A dexterous movement of the tiller at certain points of tacking seldom fails to put her about speedily.

This boat was not built for sea service, but merely to be safer and steadier in protected waters than the common open boat. Neither is she suitably rigged for speed, and yet she has repeatedly outsailed the fastest boat hereabouts; one 5 or 6 feet longer than the Proa, carrying double her spread of canvas, and that has always taken the first prize in regattas on this lake.

My object in adopting this style of craft is to render boating here a safe recreation for the ladies of Wells College, who have appreciated, during the past season, the comfort of her roomy deck and freedom from pitching and careening, and my purpose in giving you the result of this experiment is solely that you may call to the attention of your nautical readers a double-hulled boat differing in many particulars from those heretofore introduced into our waters, and whose merits it will always give me pleasure to discuss with any of your readers, giving them such further details of construction and performance as may be required.

Aurora, N. Y.

T. M. PRENTISS.

**PROA LADRONIA—A NEW DOUBLE PLEASURE BOAT.**



**Recent Progress in Microscopy.**

At the second annual reception of the New York Microscopical Society, February 7, the retiring president, Mr. J. D. Hyatt, gave a brief account of the present condition, prospects, and recent progress of microscopy. After referring to the success of the Continental makers of objectives years ago in attaining a certain mediocrity in the manufacture of lenses, Mr. Hyatt said that of late they have been altogether distanced in optical science by English and American opticians. The principal feature of advance during the past year was the celebrated Zeiss oil-immersion objective.

The formula for the Zeiss lens was worked out by Prof. Abbe, of the University of Jena, whose brilliant discovery, in the hands of the expert optician whose name it bears (Karl Zeiss), has startled the microscopical world with results not hitherto obtained, even with Powell & Laland's famous one-fiftieth. According to reliable accounts, said Mr. Hyatt, the performances of this lens are marvelous. It is claimed that the *Amphipleura pellucida* is a coarse test of its remarkable resolving powers, and that it copes without difficulty not only with such tests as Nobe's nineteenth band (113 000 striæ to the inch), but also with 125,000 striæ to the inch, mounted in balsam, in the ordinary manner. This result is obtained mainly by the interposition of a film of oil of cedar wood or some other medium of high refracting index, between the front and the thin covering glass, beneath which the object lies. The film thus interposed is made a factor in the formula upon which the lens is constructed, the great loss of light occasioned by media of low refracting power being thus obviated, and the utmost obliquity of the ray turned to practical advantage. The oil also acts as an elastic front, permits ample space for focusing, and thus renders the collar adjustment unnecessary. Again, the front combination is made active, up to 6° beyond the equator of the sphere, a surface exceeding the hemisphere by about one-twentieth of the sphere's diameter being thus applied as a clear lens. This last feature is rather a curiosity than a novelty, Tolles and others having made use of hyperhemispherical lenses in the construction of high-power objectives.

The greatest success in micrometer manufacture of recent years was accredited to Prof. Rogers, of Cambridge, who, by means of a complicated instrument constructed by himself, has been enabled to lay off lines upon a glass slide at distances apart of one one-hundredth and one one-thousandth of an inch with such accuracy that the deviation is less than one one-millionth of an inch.

**SCIENTIFIC TOYS.**

The toy shown in Fig. 1 was invented by Mr. J. Pfeiffer, and is amusing and at the same time instructive, as it shows all the principal phenomena of statical electricity. It consists of a plate of vulcanite, about one third of an inch

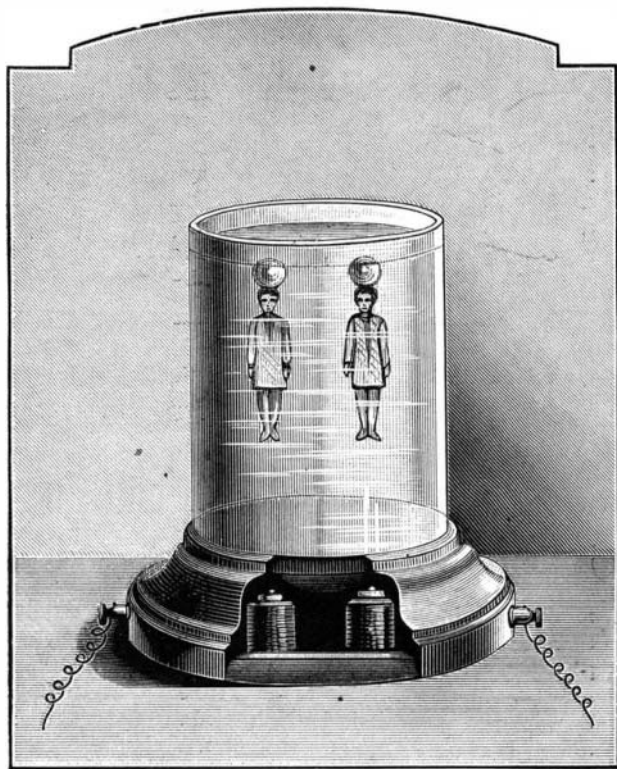


Fig. 2.—ELECTRIC BOTTLE IMPS.

thick, and about half the size of a page of the SCIENTIFIC AMERICAN. One or more small pieces of tin foil about the size of a playing card are pasted on one side of this plate. The vulcanite electrophorus produces electricity with remarkable facility. It is placed on a table, and the surfaces are successively rubbed with the palm of the hand. If the plate is raised from the table and the tin foil is approached by the other hand, a spark from one third to four fifths of an inch long is produced. A number of figures of elder pith complete the toy, and show the phenomena of electrical attraction and repulsion in the most comical manner. The plate being excited, the small elder pith figures are placed on the tin foil, and the plate is lifted from the

table. One of the figures will raise its arms, the hair of another will stand out like the bristles of a porcupine, and the third, which is to be lighter than the rest, will perform very laughable movements, and will seem to play with the two pith balls.

Fig. 2 shows electric bottle imps, made by Mr. De Combettes. A cylindrical glass vessel is filled with water, and mounted on a hollow base containing an electro-magnet provided with battery connections. One or two small figures, surmounted by a hollow glass bulb, and having a small piece of wire attached to the feet, are placed in this vessel. The air in the hollow glass bulb will draw them up to the surface of the water, as shown in one of the accompanying

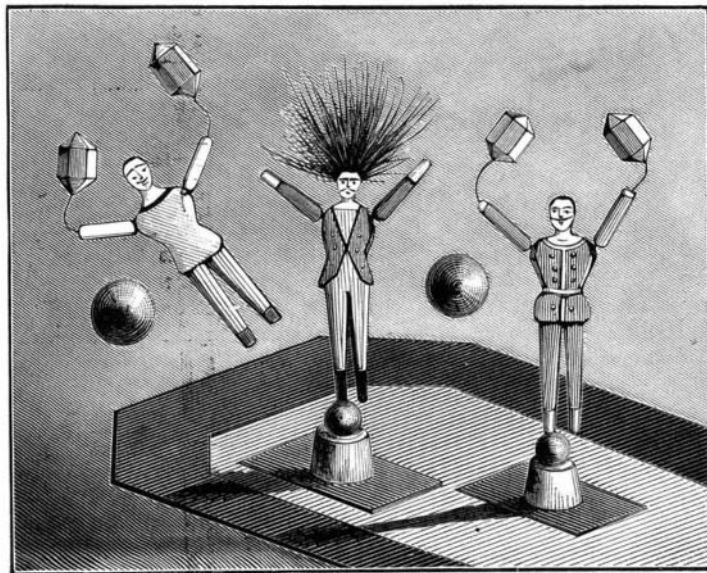


Fig. 1.—ELECTROPHORUS WITH ELDER PITH FIGURES.

engravings, but as soon as the current is passed through the electro-magnet, the figures will be drawn down to the bottom of the vessel. As soon as the current is interrupted the figures will rise rapidly.

The magic fishes, shown in Fig. 3, resemble the device just described. The electro-magnet is replaced by a small electro-motor which rotates from right to left or from left to right, and causes a corresponding movement of the fishes in the vessel.

**RECENT INVENTIONS.**

Mr. Hosea Willard, of Vergennes, Vt., has invented a novel scale beam, the object of which is to facilitate the weighing of articles on the same scale by different systems of weighing—as, for instance, by the ordinary avoirdupois system and metric system, by avoirdupois and troy weights, net and gross weights, etc.

Mr. Michael H. Hagerty, of Brooklyn, N. Y., has patented a glass stopper for milk bottles and other similar articles with a metal eye for the reception of the bail by which the stopper is fastened to the bottle. The stopper has a central depression in which is a metal eye, the shank of which is moulded into the glass stopper in the center of the depression.

Mr. Andrew D. Martin, of Abbeville, La., has patented an improved saddle blanket, which is light, cheap, and durable. The blanket is woven on a hand or machine loom, with strands twisted out of black Spanish moss. The warp is of sufficient length for a number of blankets, and the weft is interwoven with it, and the blankets are cut off at the desired length when completed. A strand of cloth is woven in between the weft at the ends of each blanket, and one or more strands of cloth or some similar material, are woven into the middle of the blanket. The edges of the blanket are trimmed with a binding of cloth, leather, or oil-cloth.

Mr. William H. Allen, of New York city, has invented an improved machine for weighing grain and other substances as they flow from a spout, discharging them in uniform quantities into a hopper or other receiver, and registering the weight of the substance discharged.

An improvement in washing machines, patented by Mr. George W. Dorris, of Elgin, Texas, consists in combining a lower cylinder having longitudinal spiral grooves with an upper cylinder having longitudinal straight grooves and holes.

An improved apparatus for refining camphor has been patented by Mr. William V. McKenzie, of Rahway, N. J. The method of using this apparatus consists in placing the crude camphor upon the diaphragm in a suitable covered vessel, and introducing steam of proper temperature from a boiler into the chamber below the diaphragm to cause the camphor to evaporate or sublime. The moisture or a portion of it contained in the crude material passes off as steam through an aperture in the cover, while the camphor sublimes or evaporates and collects upon the under side of the cover in a solid cake that may readily be removed by slightly heating the cover. The impurities of the camphor remain behind on the diaphragm.

A safe, easily-operated, and strong device for fastening the ends of the traces to the single-tree, has been patented by Mr. Millard M. Bowlus, of Bowlusville, O. The device consists of a flat metal spring attached to the back edge of

the single-tree, and provided with a notch which receives the edge of the end of the trace, and, together with an adjacent notch in the single-tree, holds the end of said trace on the single-tree.

Mr. Dennis Harrington, of New York city, has patented a device for transporting or moving live stock on foot through the streets of a city. It consists of a pen without a floor, mounted on wheels, and arranged to be drawn forward by animals. By this arrangement stock can be moved through the streets of a city with perfect safety to the inhabitants, as it is impossible for the animals to escape from the moving pen.

Messrs. Samuel Mart, of Sutton-at-Hone, County of Kent, and Charles W. Bradley, of York Street, County of Surrey, England, have patented apparatus for heating or cooling water and other liquids wherein the water is circulated in tubes within a heating or cooling space and drawn through a pipe as desired for use. In heating water the inventors make use of gas burners to which the gas is turned on when required by a cock, which also supplies gas to a pilot burner that burns continuously to maintain the heat and keep up a circulation. The gas cock is combined with the water supply pipe in such a manner that a single handle is made use of for regulating the gas supply, the supply of water to the boilers, and the delivery of the hot water. The hot water is delivered by a rising pipe above the heater, into which the hot water is forced by the pressure when the water inlet to the heater is opened. In cooling water, ice is substituted for the burners.

An animal poke, patented by Mr. James T. Camp, of La Fayette, O., consists of a bow to place over the animal's neck, in which are pivoted the ends of two bars, one above the other. The pivoted ends of the bars are provided with cams, so arranged that by pressure on the lower bar the poke is spread open. The free end of the lower bar, when it is drawn down, throws the free end of the upper bar up against the head of the animal.

Mr. George W. Ebright, of Waynesville, O., has patented a new, simple, and amusing toy, consisting of a box containing a slide provided with a rubber or other suitable spring. To this slide a goat or other animal is fastened, which, when the spring is pulled, butts against the figure of a boy on the front part of the box.

Mr. Washington Irving Marsh, of Northville, Mich., has patented a device for preventing the ends of the whiffletree from catching upon or striking against any objects. It consists of a plate of wood or metal attached to the trace of a harness just in front of the cock-eye, and extending rearward past the hook and end of the whiffletree.

Messrs. James W. Gault and William A. Forman, of Murphysville, Ky., have patented an improved elevator for hoisting tobacco plants and leaves and suspending them upon the rails in drying or curing barns. This device can easily be worked by one person, and by it the tobacco sticks can easily be hung six inches apart, or closer, if desirable, thus economizing all the hanging room in a curing barn.

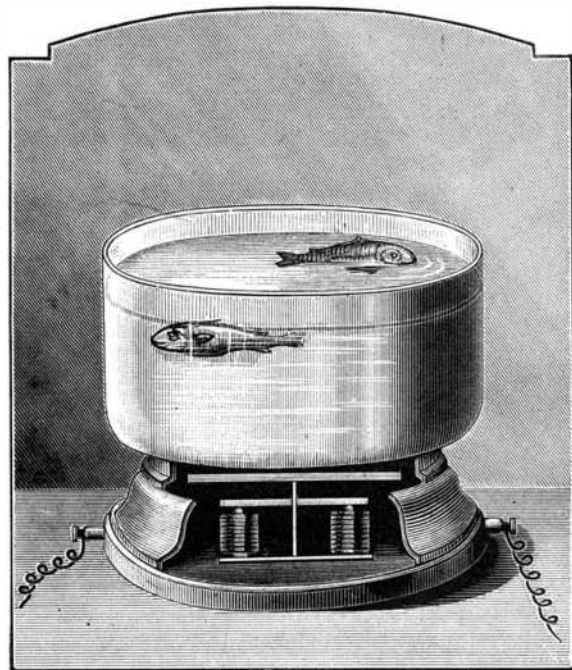


Fig. 3.—MAGIC FISHES.

Mr. John H. Yates, of Sharon, Wis., has invented an improved nasal inhaler, which is simple, convenient, and so arranged that the air can circulate very freely through it before being inhaled. The invention is an improvement on the inhaler for which letters patent No. 167,209 were granted to Mr. Yates and Mr. Charles R. Treat, dated August 31, 1875.

Mr. John Toler, of Newark, N. J. has patented an improved furniture caster. The object of the invention is to provide a solid bearing in a two part caster socket for the conical head of the caster spindle, and to secure the spindle in said two part socket without the use of screws or rivets.