

### A NEW SURF BOAT.

The accompanying engraving represents a novel surf boat recently patented by Mr. Richard H. Tucker, of Wiscasset, Me. The boat is circular in form, with convex upper and lower surfaces, and its entire interior forms a reservoir for holding compressed air to be used in the propulsion of the boat. The propelling device is very simple. It consists in air nozzles projecting toward the stern, one being placed in each between the keels, of which there are several. The air nozzles are provided with valves which are operated from the deck. The boat is steered by closing the air valves on one side or the other as may be required.

This boat is not designed for long distances, but it is claimed that it has propelling power sufficient for ordinary requirements. It certainly contains no machinery which can become impaired either by use or rest, and it possesses sufficient buoyancy and is of the proper form to maintain its proper position in the water.

### Reaping 20 Square Miles of Wheat.

The poetry of the harvest field will have to be rewritten. A correspondent of the *Chicago Tribune*, writing from the Dalrymple farm, furnishes the rough materials for one canto.

"Just think," he says, "of a sea of wheat containing twenty square miles—13,000 acres—rich, ripe, golden; the winds rippling over it. As far as the eye can see there is the same golden sunset hue. Far away on the horizon you behold an army sweeping along in grand procession. Riding on to meet it you see a major general on horseback—the superintendent; two brigadiers on horseback—repairers. No swords flash in the sunlight, but their weapons are monkey wrenches and hammers. No brass band, no drum beat or shrill note of the fife, but the army moves on—a solid phalanx of twenty-four self-binding reapers—to the music of its own machinery. At one sweep in a twinkling, a swath of one hundred and ninety-two feet has been cut and bound—the reaper tossing the bundles almost disdainfully into the air—each binder doing the work of six men. In all there are 115 self-binding reapers at work. During the harvest about 400 men are employed, and during thrashing 600—their wages being \$2 a day with board."

### EDISON'S LATEST TELEPHONE.

Some weeks since we described Professor Edison's electro-chemical telephone as it first appeared in practical shape; since then it has passed through a succession of changes until it has finally assumed the compact and convenient form shown in the accompanying engraving. The form, however, is not the only change. In the first electro-chemical telephone, it will be remembered, the chalk cylinder was supplied with moisture by a movable roller which dipped in the exciting fluid and supplied it with moisture. This movable roller is now dispensed with, and the chalk cylinder is inclosed in a vulcanite box, seen at the end of the movable arm. The cylinder, when once moistened, remains in that condition for an indefinite period, as the box is practically airtight.

The small shaft that runs parallel with the iron arm extends through the side of the box and carries the chalk cylinder. Upon the opposite end there is a small pinion moved by a worm, the crank of which is turned by the finger. The diaphragm of the receiving instrument is covered by the front of the box, excepting a small central portion which is quite sufficient for the exit of the sound.

The arm which supports the receiving instrument is jointed so that it may be raised vertically out of the way when the telephone is not in use.

The transmitter is contained in the stationary rectangular box; its mouthpiece projects slightly, and the diaphragm, which is of mica, is supported by a metal frame and springs inside the box cover. This transmitter is quite different from the carbon transmitters now so largely in use in this country, and it will be new to many of our readers; but it is one of Prof. Edison's earliest and best telephones or microphones. It is exceedingly simple and does not require frequent adjustment, while it is equally as sensitive as existing forms of transmitter. The details of its construction will be understood by Fig. 2. A vulcanite arm is secured to the center of the mica diaphragm by means of a small bolt, which is connected with one pole of the battery by a piece of metallic foil or very thin copper wire. The head of this bolt is platinum-faced, and sunk deeply in the vulcanite arm, the same cavity containing also a piece of carbon pencil, such as is used for electric candles. The carbon fits the cavity loosely and is rounded at both ends. Its outer end is pressed by a platinum-faced

spring secured to the outer end of the vulcanite arm. The spring carries at its free end, exactly opposite the piece of carbon, a brass weight, and the pressure of the spring upon the carbon is regulated by the small set screw. A wire or piece of copper foil, connecting with the spring, completes an electrical circuit, which includes the primary of an induction coil contained by the rectangular box. The secondary wire of the induction coil is connected with the telephonic line, and a tertiary coil which envelops the secondary is connected with the rubber and chalk cylinder

chalk cylinder and the platinum faced rubber, and as the chalk cylinder revolves the friction of the rubber is varied according to the variation of the primary, secondary, and tertiary currents. The platinum faced rubber is connected with the diaphragm, and the friction of the rubber is sufficient, when no current passes, to pull the diaphragm forward as the cylinder is turned; but when the slightest current is sent through the primary coil, the induced tertiary current transforms the frictional surface of the chalk into a frictionless surface and the diaphragm springs back. All this to describe a single vibration of the diaphragm, thousands of which are required for the utterance of a single sentence. It is not essential that the current should be broken to produce the effect in the receiver. It is probable that an absolute break never occurs in the ordinary use of the telephone.

An ordinary call bell is adopted in this system as a means of giving an alarm.

This telephone is unrivaled for loudness of speech, and an electro-magnet is not required in its construction.

### MISCELLANEOUS INVENTIONS.

An improved hose coupling has been patented by Mr. Frederick Stewart, of St. Louis, Mo. The object of this invention is to construct hose couplings so that the water passage will be unobstructed and of the full inner diameter of the hose; also, to render the joint of the coupling water tight without using packing rings.

An improvement in electric lamps has been patented by Mr. Norborne B. Gantt, of Louisville, Ky. This invention relates to the construction of the supports for the carbon holders, by which, as the carbon burns away, the electric arc is at one point.

An improved shuttle spindle has been patented by Mr. Henry A. Boyington, of Manchester, N. H. The invention consists in shuttle spindles made in two semi-cylindrical parts, placed one above the other, with their flat sides toward each other, having semi-conical heads formed upon their forward ends, having inclined projections or cams formed upon the middle parts of their adjacent sides, and pivoted at their rear ends to the shuttle by two pins, so arranged that the upper pin may be in the rear of the lower one.

Mr. Thomas H. Hicks, of London, Ontario, Canada, has patented an improvement in the class of cylindrical drums or blowers used with carbureters, and which are provided

with gudgeons, and rotate in water or other liquid, so that the latter alternately seals and opens the induction and exit orifices for the air or gas passed through the blower or drum. The force of the current of gas flowing to the burners is the motive power which turns the blower or drum on its axis, and the inventor utilizes this force for inducing atmospheric air into a portion of the rotating drum which exactly corresponds in construction to that part of the drum through which the gas passes.

Mr. Orlando Cleaveland, of Middlesex, N. Y., has invented an improved ironing table, which is readily adjustable in height, and may be used for various other purposes than for ironing—for example, as a work, or lunch, or a lamp table.

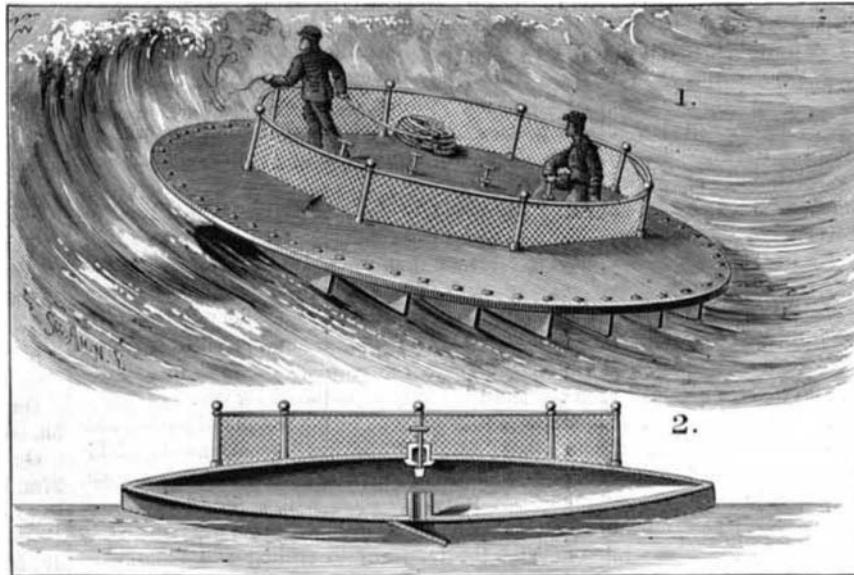
An improved gate and door closing device has been patented by Mr. William H. Williams, of Mineola, N. Y. This improvement relates to gate and door hangings wherein the gate is closed by a weight. It consists in a novel means by which the weight is shifted to change its purchase and obtain the greatest effect when the gate or door is closed.

Mr. David E. Wilson, of Darlington, Md., has invented an improvement in cattle fasteners, which consists, mainly, of a crank rod or eccentrically pivoted bar, which is arranged close to the inner side of a series of mangers, so that when turned up or revolved a part revolution it will clamp against the manger the ends of the chains or halters which are pendent from the necks or heads of the cattle, and thus secure them. When turned down, it will release all the neck chains or halters at the same time.

An improvement in harness has been patented by Mr. Charles R. Stanhope, of Ashtabula, Ohio. The object of the invention is to furnish an improved means for connecting the belly band or girth and the martingale of a harness, the use of which will allow them to

be disconnected without unbuckling the belly band or girth to prevent the horse from being chafed by the martingale interposed between the belly band or girth and his body.

THERE is deposited in the San Francisco Mint a collection of ancient and modern coins valued at \$100,000. Among them is a silver shekel of King David's time. This is the oldest coin extant. Another is the Roman penny, with the twins and their foster-mother, the wolf, date 700 B. C.



TUCKER'S SURF BOAT.

of the receiving instrument. Below the transmitter box are two keys, the right hand one being used for signaling, the left hand one for completing the tertiary circuit when a message is received.

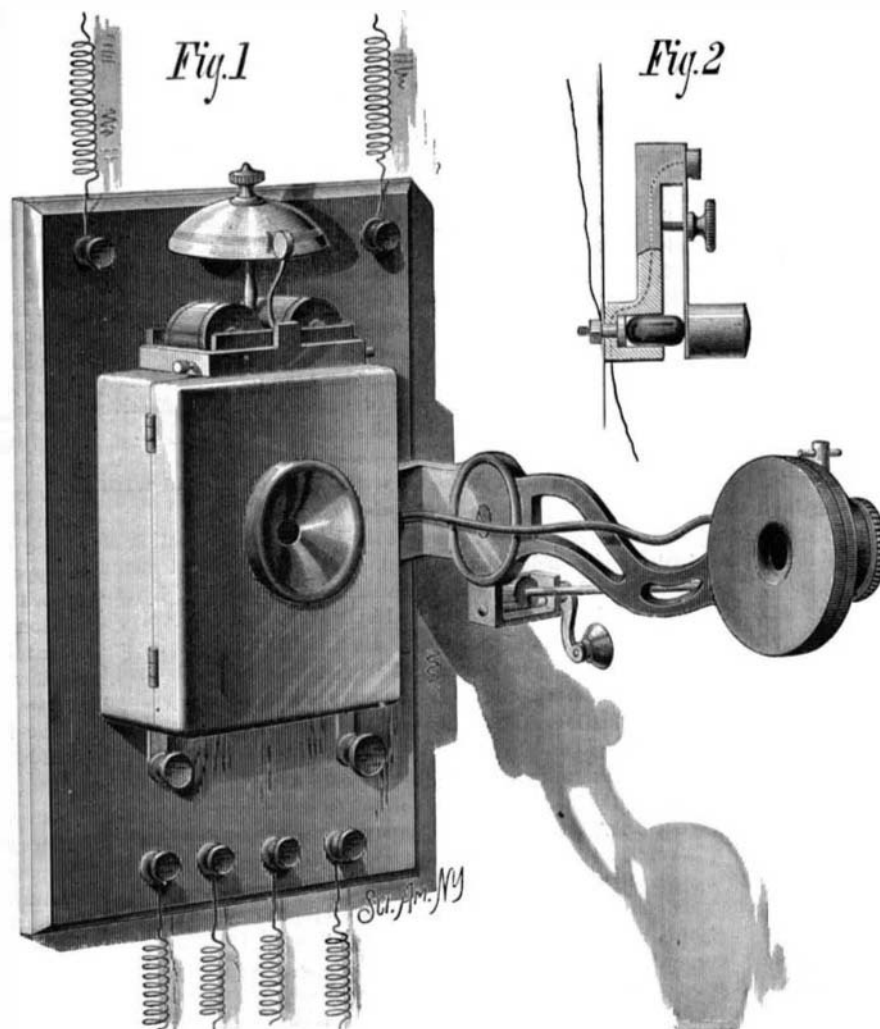
The cylinder of the receiving instrument is made of precipitated chalk solidified by great pressure. The fluid now used to saturate the chalk is a dilute solution of hydrogen disodic phosphate. Professor Edison has found by a long series of experiments that the solution employed must be that of an alkali or the phosphate of an alkali, and the hydrogen disodic phosphate is found to be superior to all others.

The operation of this telephone will be understood by those who are familiar with the first electro-chemical tele-

carbon holders are automatically adjusted to maintain the electric arc at one point.

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phone. The vibration of the diaphragm of the transmitting instrument varies the contact between the carbon and the two electrodes, so that a varying current is sent through the primary of the induction coil; this of course produces a secondary current of varying intensity in the secondary wire of the induction coil, which being in circuit with the secondary wire of the induction coil of a distant instrument produces a current in the tertiary wire wound around the secondary coil. The tertiary current passes through the