

A DEVICE TO NAVIGATE THE AIR.

The aerial catamaran herewith represented has been patented by Mr. Charles E. Bechtel, of Udall, Kansas. It has two cylinders adapted to hold a buoyant material, and connected by a light frame beneath which is stretched a platform of woven steel wire supporting an electric or other motor designed to drive a rearwardly extending shaft which operates two propeller blades. To the outer sides of the cylinders are connected wings, pivotally mounted on horizontal shafts, the



BECHTEL'S AIR SHIP.

wings carrying racks engaged by annular gears in guideways carried by the cylinders, whereby the wings may be inclined at such angle to the horizontal line as may be desired. In operation it is designed that the cylinders shall be just sufficiently buoyant to not quite overcome the attraction of gravity, when, the wings being set at the desired angle, the motor is started to drive the ship by the action of the propeller blades, the upward and downward motion being regulated by the inclination of the wings, while steering to the right or left is effected by disconnecting either the left or right propeller wheel from the motor shaft.

AN IMPROVED BOOK HOLDER.

The illustration represents a light, inexpensive, and convenient portable device, which may readily be



STRIPPEL'S MAGAZINE AND BOOK SUPPORT.

clamped to a magazine or other book having a flexible cover, and thus afford a handle whereby the book or magazine may be supported in proper position for reading. It is a patented invention of Mr. John Strippe, of No. 107 West Twenty-ninth Street, New York City. The device is preferably made of hard wood, somewhat elastic, and the handle bar, which forms the central portion of the support, has a slot adapted to receive the back of the book or magazine, such slot being wider near the handle than at the outer end of the bar, thus forming spring limbs. The outer edges of these springs limbs curve slightly outward, from near the handle to the other end, and are beveled on each outer edge. A dovetail grooved locking bar is adapted to fit over the beveled portion of the handle bar, the size of the dovetail groove of the locking bar being such that as it is pushed forward it will press the spring limbs of the central bar inwardly, and clamp them upon the back of the book or magazine placed in the slot. The locking bar can be readily released from the handle bar, when the parts may be conveniently carried in the pocket.

A RECENT number of the *Northwestern Lumberman* contains one hundred pages, and includes a lumber trade directory, also descriptions of some of the larger lumber establishments. Toledo, Cleveland, and Chicago are especially favored, over fifty superb engravings being given, illustrating the most notable lumber yards. The vast extent of the lumber industry in this country is well exemplified in the pages of our enterprising contemporary.

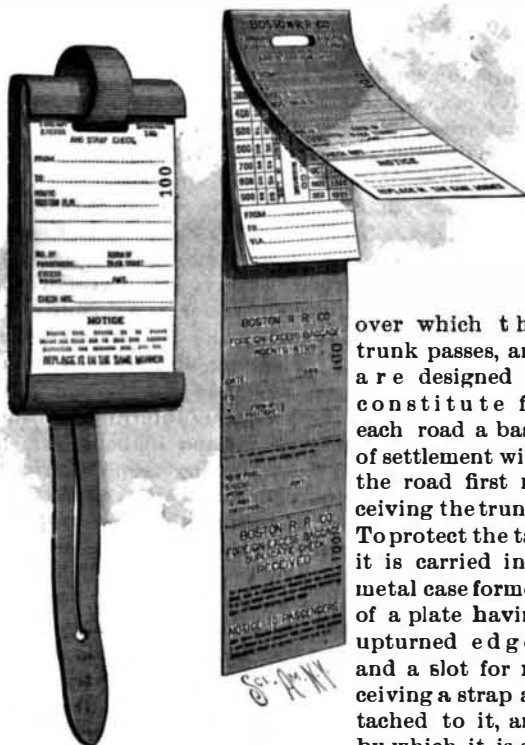
Metamorphoses of Fleas.

Mr. W. J. Simmons read before the Microscopical Society of Calcutta, March 5, 1888, an interesting paper on "The Metamorphoses of the Dog Flea," which has since appeared in the *American Monthly Microscopical Journal*. He presents some novel phases of flea life, well calculated to excite one's interest in these quite generally anathematized insects. It is stated that there are twenty-five different species of fleas; the dog, cat, fowl, marten, rat, squirrel, hedgehog, mole, pigeon, and bat each having its own species, while it is a curious fact that there are also vegetarian species, two of which are mentioned. One of these latter lives in brushwood, while the other is a lover of mushrooms. Besides these, the flea which attacks man has not been mentioned, to which must be added the jigger of tropical America, this being also a true flea. Mr. Simmons makes a considerable point of the order of length of the tarsal joints in the classification of fleas.

Following his notes on the transformations of the dog flea we find: Eggs were deposited early in the morning of October 17, 1886. These were put in a glass and covered with a pane of the same material. On the morning of October 19, about fifty hours after deposition, most of the nits had hatched out, but a few took twenty-four hours or so longer. The majority, therefore, required only a little more than two days as their period of incubation. The larvæ were white, eyeless, cylindrical, active grubs; their bodies, exclusive of the head, with thirteen segments. These segments are beset with long hairs, the terminal segment ending in two curved spines, which probably aid the larva in locomotion. They were supplied with no food except blood pellets (the supposed excreta of the adult flea) that had been left with the nits, etc., on a cloth by a sleeping dog. They were suspected, however, of cannibalism, as their numbers thinned with no other apparent cause. On October 25, the seventh day after leaving the egg cases, the surviving individuals were found curling up and otherwise acting as though about to pupate. Upon noticing this they were supplied with a fragment of "puttoo," into which, though eyeless, the larvæ quickly swarmed, and there spun little white silken cocoons. November 2, most of them quitted their cocoons as perfect, active fleas. They were, therefore, in the eggs for something over two days, as larvæ for six days, and pupæ for eight days, attaining their adult state on the seventeenth day after the deposition of the eggs. This is a much shorter period than given by older writers—Westwood, followed by Packard—who affirm that fleas are larvæ for twelve and pupæ for eleven to sixteen days. However, this may in part be due to the warmer climate of India, where the observations just detailed were made. —*Insect Life*.

AN IMPROVED BAGGAGE CHECK.

The illustration represents an excess-baggage tag which has been patented by Mr. Frank H. Crump, of No. 1300 Pennsylvania Avenue, Washington, D. C. This invention relates mainly to the upper section of a tag ordinarily printed in one piece, on which are also the agent's stub and the passenger's stub, separated by lines of holes to facilitate tearing off. The improvement consists in a tag having a protective flap, beneath which is held a series of similar coupons, each bearing a printed scale of the excess in weight and the date, which may be punched by the agent of the road that receives the trunk, so as to similarly mark with the weight and date each coupon. These coupons are successively torn off by each road



CRUMP'S BAGGAGE CHECK.

over which the trunk passes, and are designed to constitute for each road a basis of settlement with the road first receiving the trunk. To protect the tag it is carried in a metal case formed of a plate having upturned edges and a slot for receiving a strap attached to it, and by which it is attached to a trunk.

AN IMPROVED LIFE RAFT.

The device shown in the illustration has been patented by Mr. Mills Edwards, of No. 426 Bergen Avenue, Jersey City, N. J. It is a rectangular buoy composed of a canvas covering and a filling of cork or other buoyant material, other similar buoys being fitted between the sides and ends, and the buoys being held between or having lashed on their opposite sides light binder frames of wood. At opposite corners of the main rectangular body is fitted a receptacle for oil,

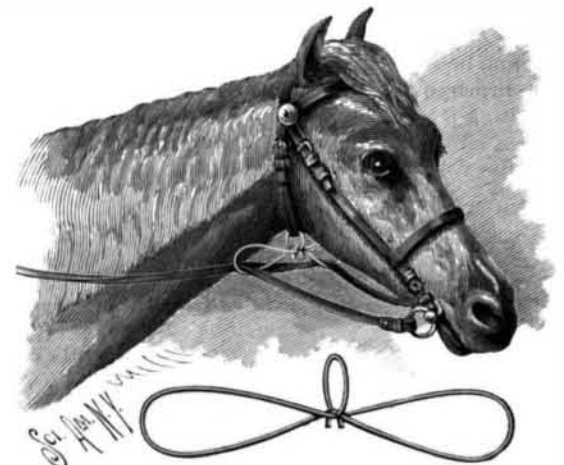


EDWARDS' LIFE RAFT.

with a pipe through which a person with the breath may force oil in small quantities out upon the water to quiet the waves. At the center of the inner buoys are tanks or receptacles for drinking water, with tubes therefrom for the supply of the occupant of the raft, while at each side of the inner buoys is lashed a pouch in which provisions may be carried. There are ropes at the sides and ends of the raft, and oars are lashed thereto, while at one end is a drag rope and drag by which the raft may be kept up in the wind and kept steady in rough weather.

AN IMPROVED REIN GUIDE.

The device shown herewith is designed to guide and support the reins so that they will not be liable to en-



STOAKES & FRITH'S REIN GUIDE.

tanglement with the thills or shafts, and has been patented by Messrs. James W. Stoakes and Thomas F. Frith, of Milan, Ohio. It is made, as shown in the small view, of a single piece of spring wire bent upon itself to form two end loops, through which the reins pass, and a central ring, by which it is suspended from the throat latch of the bridle. The device readily swings into position to allow the reins to be manipulated as desired, without their bearing to any appreciable extent upon it, but when the reins are slack they are held up from being swung by the horse under the ends of the shafts.

WE are accustomed to be told that the most impure water will be rendered pure by boiling, and that in this we have an absolute safeguard against the danger of water containing disease germs. Now while it is true that boiling will kill the germs of disease, yet the fact has been brought to our notice, says *Annals of Hygiene*, by so high an authority as Dr. Chas. M. Creson, that while boiling kills the germs of a particular disease, it yet, in reality, renders the water more impure than it was before, because by the very death of these germs, dead organic matter is allowed to remain in the water, which is polluted by putrefaction. Hence, while boiling is a most excellent precaution against the occurrence of typhoid fever or similar diseases, when we have occasion to think that the germs of these diseases exist in the water that we drink, yet we must remember that this boiling does not purify the water; it simply removes from it the specific power to produce a specific disease.