

Correspondence.

The Bicycle.

To the Editor of the Scientific American:

I have often wondered why some of the manufacturers don't make one for older riders or ones too heavy to be athletic enough for the common safety bicycle. Why can't one be made with two rear wheels, about five or six inches apart, with the sprocket wheel and chain between them? The crankshaft would not need to be much longer than the regular safety, and the power would be applied directly in the middle, instead of one side, as in the safety. J.

Ceylon Vipers.

To the Editor of the Scientific American:

Order *Ophidia* and sub-order *Viperiform*.

We are thus introduced to the serpents whose lethal power is next to that of the cobra.

Sub-order viperiform is subdivided into two families:

1. *Viperidae*, with two genera.
2. *Crotalidae*, with four genera.

In this article I propose to speak only of the *Viperidae*.

The general characteristics of the vipers are:

- (a) Short, thick bodies and wedge-like tails.
- (b) Diamond markings.
- (c) Laterally protruding cheeks.

The poison of vipers has been found to be charged with *venom globulin*, which produces fluidity of the blood and thus destructive hemorrhages. Also a general paralysis attends the introduction of viperine poison to the system.

It is primarily local, in distinction from cobra poison, which at once attacks nerve centers.

Antidotal Treatment.—Tourniquet, incision, and cauterization. Potassium permanganate (ammonia and alcohol) internally.

INDIAN.

Genera.—First, *Scientific*.

(a) *Daboia Russelli*.—2½ to 4 feet in length. Color, dark to light brown, in diamonds and marbled markings. Viviparous. 3 to 6 inches circumference. Fatally venomous.

(b) *Echis carinata*.—20 to 25 inches by 3 inches circumference. Color grayish-brown, and marked with quadrangular spots, white, edged with chocolate.

Scales are keeled. Hence the name—*carinata*.

A viviparous, vicious viper, active and offensive.

Venom—globulinic, like *daboia*.

Second, *Local Genera*.

In Ceylon the natives distinguish five varieties of vipers:

1. *Blood Viper*.—3 feet long, and marked with dark green diamonds.
2. *Black and White Viper*.—2 to 2½ feet. A common variety.
3. *Brown Viper*.—3 to 4 feet. Large and sluggish.
4. *Tumefacient Viper*.
5. *Grass Adder*.—2½ feet.

I have killed specimens of 1, 2, and 3 in Ceylon.

W. D. MARSH.

Amherst, Mass.

Wire Shafts for Steamers.

To the Editor of the Scientific American:

In view of the frequent and especially the several quite recent instances of the breakage of steamship shafts, it may be of interest to the general public, particularly to sea-going travelers, to know the results of some experiments recently made with an elastic shaft constructed of steel wires of small diameter, massed and bound together so as to secure all required strength, and to possess elasticity, both torsional and transverse, to a degree not possible in a rigid shaft.

Rigid shafts are broken, mainly because it is not possible to maintain exact and true lines of shaft bearings in ships of great length, and frequently because of undiscoverable flaws and imperfections in the shaft metal. Ships bend when sailing in rough and boisterous seas, and variations of atmospheric and water temperature expand and contract the metal of the hull, causing powerful bending strains which crystallize the metal of the shaft, weaken and ultimately destroy its vitality, until rupture and possibly serious disaster is realized.

In the construction of a wire shaft, every part, from the center to the circumference, comes under the observation of the expert in charge.

The experiments referred to show that when the shaft is in position, and when rotating stress is applied, a tensile force is exerted upon the individual wires and their several fastenings. Each is a unit of strength and sustains its pro rata of the total amount of stress. The law of action and reaction determines the amount. It cannot be greater than the available power of the engines of the ship in any given case.

The strength of the individual wires and of the fastening being known, it is practicable to ascertain the po-

tential strength of the shaft as a whole. Suppose it to be made in five sections, its total length one hundred feet, and its diameter fifteen inches. The shaft will have twenty-five thousand No. 7 steel wires, each twenty feet long, with their fifty thousand fastenings. Each wire and each fastening will sustain a load of five hundred pounds without rupture or injury, making a total inherent strength of 37,500,000 pounds, twenty-five times greater in amount than the continuous force of an engine of 5,000 horse power. A stress of twenty-five pounds only upon each unit of strength, each point of resistance existing in a wire shaft as named, will more than equal the force of such an engine.

The wires of each section are welded together at their ends, making a solid mass of steel upon which couplings are fixed for bolting the several sections together. The spaces between the couplings are inclosed in short metal bands holding the body of the wires of each section in their normal cylindrical form, at the same time permitting a transverse elastic or bending movement when the ship bends, also elasticity of torsion when powerful waves strike the propeller wheel, lessening, or altogether eliminating all risk of injury to the crank and engines.

An additional inherent element of strength becomes active when torsional stress is applied to the shaft, viz., the friction of the individual wires pressing one upon another. The greater the stress, the greater will be the amount of friction.

If built with reasonable care and skill, such a shaft cannot be broken in any emergency or under the severest conditions.

The cost of building a wire shaft will also be very much less than that of a rigid shaft.

SAMUEL P. JEROME.

New York, February 17, 1893.

Recent Decisions Relating to Patents.

PATENTABILITY.

Letters patent No. 272,554, issued February 20, 1883, to Tom L. Johnson for a street railroad rail, combining the principal features of the tram and T-rails, but with a different disposition of metal and combination of parts, so as to allow the advantage of even fish plating, are void for want of patentable invention, as the change in form was merely the result of mechanical skill. 1.

Letters patent No. 340,135, issued April 20, 1886, to Howard T. Marshall for improvements in boots and shoes designed more particularly for playing lawn tennis, claim substantially (1) a continuous rubber sole with projections at the heel and tread, all moulded from a single blank; and (2) the same features, with the addition that the projections shall be conoidal and arranged in regular order. The Circuit Court holds that the improvement is of a trivial and unpatentable character. 2.

Letters patent No. 307,049, granted October 21, 1884, to John Hunt for an improvement in pneumatic conductors for elevator signals, are invalid, for there is no patentable novelty in inclosing a number of rubber tubes, each individually communicating with the signal mechanism in an elevator and with one of the floors of a building, in a jacket to keep them from kinking, stretching, and breaking, when wires used for electric signaling in elevators had been inclosed in the same way, and for the same purposes, and tubes had previously been used for operating the signaling mechanism in elevators. 3.

INFRINGEMENT.

The Circuit Court decides that in letters patent No. 167,400, issued September 7, 1875, to James P. Gordon for an improvement in packers for shutting off water from oil wells, consisting of (1) a tubular casing, (2) an expansible packer and cone for expanding it, and (3) a set of slips or wedge arms, and a wedge cone to force the arms against the wall of the well, to form a resistance base to the packer, so that when the casing is moved lengthwise the cone within the packer will expand it, the third element is novel, and is the basis of the entire device, and the patent is infringed by a device making use of the same idea by mechanical equivalents, their position merely being reversed, although in such device the wedge arms, besides serving to place the packer in position, as in the combination patented, have the additional function of aiding in sustaining the casing. 4.

Claim 1 of letters patent No. 397,766, issued February 12, 1889, to Lyman W. Welch for a folding bed, covers a combination whereby the head of the bed is carried in suspension by means of cords running over pulleys attached to the upright casing, each cord being fastened at one end to a lever crank, which is pivoted to the bed rail and attached at its lower end to a rod running to the leg of the bed, whereby the legs are folded downward as the bed is raised, the head of the bed meanwhile swinging inward and downward as the frame is folded up. The Circuit Court rules that, as this method of transmitting an eccentric motion to the legs is common in the arts, and as there is little novelty in suspending instead of supporting the head of the bed, the claim must be strictly limited to the combination in detail, and is not infringed by a bed which is supported

at the head by rods fastened at their upper ends to the upright casings, pivoted below to the bed rail, and projecting downward and connected at their lower ends to the legs of the bed, so that the resultant motion is like that described in the patent. 5.

The Circuit Court of Appeals lays it down that letters patent No. 330,916, issued November 24, 1885, to Albert Northrop for an improvement in metallic ceilings, if valid at all, must, in view of the prior state of the art, be limited to a ceiling made of panels, in which the chief characteristics are (1) the formation on two or more sides of the panels, by means of moulded edges which fit into each other, of a channel along which leakage water may flow and be discharged at orifices made by cutting away the corners of the panels, the orifices being concealed by rosettes so constructed as to aid in discharging the water; and (2) the widening of alternate sides of each panel into flanged edges, which lie loosely upon each other, so as to allow expansion and contraction by heat and cold; and hence it is not infringed by ceilings made of metallic panels generally having partially raised surfaces surrounded by mouldings gradually flattening out into flat edges, which are nailed rigidly to the furring strips, such mouldings forming no continuous channel for the discharge of water, and each panel having rosettes at the corners, which serve the purpose of ornaments only. 6.

In letters patent No. 230,590, issued July 27, 1886, to George F. Pinkham, as assignee of Jacob P. Tirrell, the claim is for, "in an electric lighting gas burner, a magnet for turning the gas cock by one electric impulse, combined with a fixed electrode, *a'*, and a movable electrode, *c'*, normally in contact, and mechanism connecting the armature with the movable electrode, to break the contact between *a'* and *c'* the instant after the gas is turned on, and create a spark for ignition, substantially as described." It is held by the Circuit Court of Appeals that a mechanism otherwise substantially the same as the one patented is none the less an infringement because it has a horizontal armature, which moves in a vertical direction, while the patented apparatus has a vertical armature which moves in a horizontal direction. 7.

Letters patent No. 205,816, issued July 9, 1878, to Henry Tibbe, claiming "a smoking pipe made of corn-cob, in which the interstices are filled with a plastic, self-hardening cement," are not limited to the use of plaster of Paris for the filling material, and it is an infringement to use either a mixture of finely pulverized corncob mixed with cornstarch, and moistened in the act of putting on by saturating the cob in alcohol, or a mixture of pulverized corncob and shellac. 8.

Letters patent No. 188,079, issued March 6, 1877, to Henry W. Smith, for an improvement in sheet metal roofing, comprises a means for making a watertight joint, and for securing the sheets firmly to the roof boards by means of an anchor piece of sheet metal, rectangular in form and bent at right angles, so that when one part is nailed to the roof the other stands upright. The adjoining sheets of roofing have upright flanges of unequal height, the anchor piece being between them. The vertical portion of the anchor piece is split centrally, and one leg is folded down over the shorter flange. On the higher flange a hem is turned down so as to embrace the top of the other leg, and then these parts are folded down over the shorter flange and anchor piece, thus completing a joint of six or seven thicknesses of metal. The Circuit Court decides that the patent is infringed by the device made under letters patent No. 403,844, issued May 21, 1889, in which a tongue is punched out of the central portion of the anchor and bent over in such manner as to embrace the lower flange, while the entire top of the anchor is embraced by the hem of the higher flange, and is then folded over the lower flange. 9.

1. Johnson Co. v. Pacific Rolling Mills Co., 51 Federal Reporter, 762.
2. Marshall v. Packard, 51 Federal Reporter, 755.
3. Hunt v. Garsed, 51 Federal Reporter, 678.
4. Masseth v. Palm, 51 Federal Reporter, 824.
5. Standard Folding Bed Co. v. Osgood, 51 Federal Reporter, 675.
6. Northrop's Ex'rs v. Rasner, 51 Federal Reporter, 685.
7. Hauzel v. California Electrical Works, 51 Federal Reporter, 754.
8. H. Tibbe & Sons Mfg. Co. v. Lamparter, 51 Federal Reporter, 763.
9. Canton Steel Roofing Co. v. Kanneberg, 51 Federal Reporter, 599.

Labels on Glass, Porcelain, and Iron.

The following is recommended in *Nouveaux Remèdes*: 120 grm. of gum arabic and 30 grm. of gum tragacanth are macerated separately in a little water; the latter mixture is agitated until a viscous emulsion is formed, when the gum arabic solution is added and the whole filtered through fine linen. With this liquid are then incorporated 120 grm. of glycerine, in which 2½ grm. of thyme have been dissolved. The volume is then made up to one liter by the addition of distilled water. This paste is said to possess remarkable adhesiveness, and to keep well in sealed flasks.