

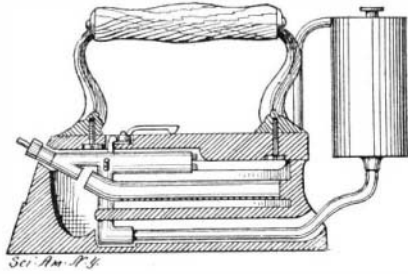
A NOVEL SELF-HEATING SAD-IRON.

One of the drawbacks to the more general introduction of the self-heating sad-iron is the necessity of using as fuel a high-grade gasoline, which, in country villages, cannot always be readily obtained. The drawback has been simply enough avoided in a new sad-iron invented by Mr. Iver Wickland, of West Superior, Wis. Besides overcoming the difficulty mentioned, the inventor has also devised a burner which completely consumes the vapor formed, and has provided a generator which maintains a constant pressure.

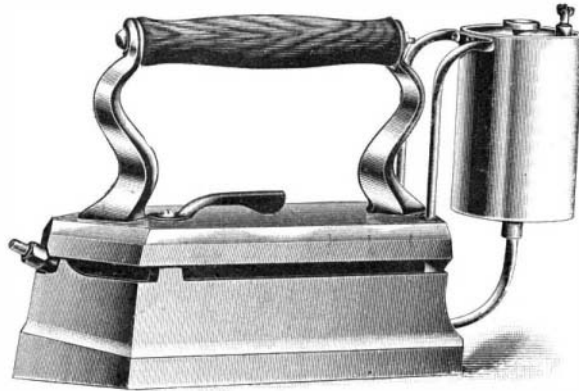
The illustrations presented herewith are perspective and partial sectional views of a tailor's goose made according to the principles of Mr. Wickland's invention.

The oil-reservoir is supported at one end of the iron. From the lower end of the reservoir a tube extends through the lower portion of the iron beneath a metal shield. The tube is connected with a retort in which the oil is received for the generation of gas. The retort communicates with a valve-casing provided with a needle-valve and arranged to discharge the vapor in a burner-tube located directly above the shield. Openings in the lower portion of the burner-tube discharge the gas downward on each side of the shield. The forward portion of the iron constitutes a cup for oil. When ignited this oil will heat the retort and adjacent parts sufficiently to generate vapor. By opening the needle-valve the vapor is mixed with air, forced into the burner-tube and ignited.

The iron can be kept hot for more than sixty hours at a cost of twenty cents. The heat can be regulated as desired. Only one iron is required for the house laundry. No stove is needed to heat several irons. The combustion of the gas is so complete that no odor is perceptible.



PARTIAL SECTION OF A SELF-HEATING TAILOR'S GOOSE.



PERSPECTIVE VIEW OF SELF-HEATING TAILOR'S GOOSE.

A SINGULAR INDUSTRY IN THE POISONOUS INSECTS OF CALIFORNIA.

BY CHARLES F. HOLDER.

Southern California has a number of so-called poisonous insects—scorpions, centipedes, tarantulas and others; yet it is rarely that they are seen outside the curiosity shop. In a residence of fifteen years in this section the writer has never seen any of these insects where they should not be, namely, in the house, and has only found them after a diligent search—a strange

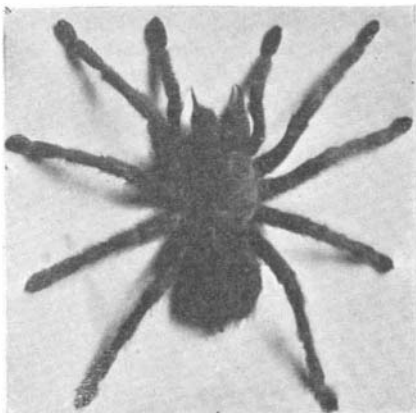


Fig. 1.—TARANTULA.

contrast to life on the Florida reef, where at night a crunching sound underfoot, or beneath the rocker, would tell the story of a wandering scorpion, the sting of which is extremely painful.

In Southern California there is, singularly, a great demand for all the insects mentioned, which constitutes a business of some magnitude, involving the



Fig. 3.—SCORPION.

more or less skilled labor of a number of persons. In China such a demand might be understood, as objects of this kind are of use in the medicinal dietary of the Celestial Kingdom; but what Americans not naturalists should want with hideous tarantulas, unspeakable centipedes and others would seem a mystery,

yet these commodities are eagerly sought for by tourists in such numbers that thousands are sold annually, and one dealer stated that he had difficulty in supplying the demand. When asked to explain the apparent craze for such objects, he replied: "They fall in line with what are known as curiosities, and

Southern California being the great American tourist center, they naturally find a sale. The average tourist thinks it necessary to carry home something as a souvenir; in nine cases out of ten the same thing can be bought in the East; but they wish something that came from the locality in which they are visiting. I sometimes think that tourists wish to convey the idea to their less fortunate friends that they have been traveling in a dangerous country, and so send or take back home the poisonous insects as evidence of it. In any event, there is an ever-increasing demand for them."

There are in Southern California several wholesale houses who employ men to mount these horrors, and the method of work is not uninteresting. While one rarely sees a scorpion or tarantula in this section, a careful search for them is generally repaid, but it is not near houses. In Florida the scorpions are surface lovers, and houses, and especially old board piles, offer the greatest inducements to them; but in California this insect is a burrower and found underground, as are the tarantula and trapdoor spider. The tarantula trade is, perhaps, the most important; the huge hairy creatures being more repulsive than others are consequently more in demand. The low hills to the south of Pasadena were once famous collecting grounds, being partly adobe, the soil especially suited to the building operations of the insect burrowers. At this place I once found the collectors of one of these firms. They were boys, and each was supplied with a large bottle of water, a tin can and a forked twig or stick. The ground was rough, dotted over with gopher and squirrel holes, and every few yards a hole about an inch and a quarter across could be seen. Sometimes this was covered with a gossamer shutter of web, but generally it was wide open. Placing his can on the ground, one of the boys uncorked the bottle he carried and poured a little of the contents into the hole. The water was probably tinctured with alcohol, as I doubt if pure water would have sent the occupant up so quickly; a fierce spider with a span of legs nearly four inches in extent, a huge hairy creature with a body seemingly as large as that of a mouse. Out it darted, then seeing danger ahead, drew back; but the forked twig was deftly inserted beneath its body, and the spider was tossed several inches away where it settled back in the manner popularly described as "on its haunches," showing the death-dealing fangs ready for action.

It was a tarantula, the *Mygale hentzii* of science, a near ally of the bird-eating spider of South America, and a creature to admire from a distance. But the young collector treated the insect with scant courtesy, placing the mouth of the can before it and hustling the giant into it with a businesslike air; then with bottle in hand he moved on. The next find was a trap-door spider (Fig. 2), very common in Southern California. This is the *Cteniza Californica* of science, a most remarkable and ingenious nest builder. The spider sinks a tube from six inches to a foot in length, lines it with silk so that it presents a perfect satin finish; then a door of silk and clay is made, which

fits so perfectly that it is water and air tight, this works on a hinge, also made of silk. Just on the inner rim are several small holes, which look as though they might have been made with a pin; these are where the spider grips the lid with its mandibles to hold it down. This the boy illustrated for my benefit. The nest could only have been seen by an expert, as the outer part of the lid was exactly like its immediate surroundings in color and tint; but the collector's eye was keen, and he seemed to find the nests with perfect ease. As one was discovered he dropped to the ground and deftly inserted the point of his knife beneath the lid, lifting it up and exposing the silvery interior; a most marvelous structure, as the work of a spider. Dropping the lid the boy asked me to lift it, saying that the spider was upon the other side holding it down. As I inserted the knife and lifted I could feel the little owner tugging at the lid, and as I raised it, caught a glimpse of the hairy legs. She had the lid firmly in her mandibles and was holding it with a force which would be effective against what might be termed her normal enemy. The spider was ousted by pouring water into the tube, and quickly landed in the tin cup. The boy now cut out the door of the tube and about four inches of the latter which was later mounted in a square box and the spider placed within to tell the complete story. In the course of the forenoon a number of tarantulas were caught in this way, also as many trap-door spiders. Scorpions were found in small burrows near the surface, or often in the holes of lizards.

The tarantula merely digs a burrow from six to twelve inches in depth, and makes no pretense of covering it, though sometimes there is a mass of web at the bottom, and at times a web placed over the entrance. The insect is a night-feeder, roaming about, preying upon crickets, beetles and other insects so unwise as to venture forth at the same time. The spiders brought in by the boy collectors, who search the country for them in all directions, are killed by immersion in alcohol, and handed over to the taxidermist who prepares them as quickly and cheaply as possible; the abdomen is filled with cotton and the insect then dried in a position to show its greatest spread. The room of the taxidermist is a chamber of horrors; the walls covered with tarantulas; scores of them drying,



Fig. 2.—TRAPDOOR SPIDER.

while hundreds more await preparation. Exactly how many of these insects are sold in this way to the tourist trade is not known, but the firm referred to—Messrs. Wakely & Company—mount thousands every year, not to speak of centipedes, trap-door spiders and horned toads.

Among these insects is a giant wasp, common here and generally sold under the title of tarantula hawk, the wasp being an inveterate enemy of the spider. I have often followed the wasp in its search, and no hound ever tracked a fox with more eagerness. It would walk rapidly over the ground, examine every hole and crevice, vibrating with emotion; and when a hole was discovered, darted down into it eagerly; a few moments later perhaps out would come spider



Fig. 4.—TARANTULA HAWK.

and wasp engaged in a terrific battle. The wasp was overmatched, as regarded size, its burly antagonist rolling it over and over; but the wasp evaded the strong mandibles and finally managed to drive its rapierlike sting into the tarantula, which paralyzed it; indeed, the effect was at once apparent, the spider

retreating, followed by its active enemy which merely desired to use it as depository for its eggs.

In almost every town in California the singular industry described is carried on, and its effect in Pasadena has been to materially diminish the supply of tarantulas, the places where they were once common knowing them no more.

The Recent Eruptive Period of Vesuvius—Simultaneous Formation of Two Nitrated Salts in the Crater.*

The eruptive period of Vesuvius commenced on the 3d of July, 1895. It continued with uniform phenomena until September 3, 1899, when the lava ceased to flow by the lateral fissure. From that time the crater, which was then 656 feet deep, began to fill up again. On April 24, 1900, it was only 260 feet deep, and contained a magma of bases rich in aeriform products. A period of a month of extreme activity ensued. There was no emission of lava, but the explosions within the crater were intensely violent, especially from May 4 to May 14, the maximum occurring on the 9th of May. They could be distinctly heard throughout all Campania Felicia. The crater was enlarged by 13 or 16 feet in diameter. At the end it measured 537 feet from southwest to northeast and 590 feet from east to west. The circumference was 1,771 feet. The flames were abundant, due to the emission of the vapors of sulphur and hydrogen sulphide. The greatest height attained by the bombs and scoriæ was 1,761 feet from the bottom of the crater.

On the 9th of May a boulder measuring about twelve cubic meters was thrown out, which weighed approximately thirty tons. This was the greatest ejected, and took about 17 seconds in passing over the whole trajectory, falling on the ground with a velocity of about 262 feet a second. The vis viva of the vapors

* R. V. Matteucci in a paper presented at the Académie des Sciences.

which had propelled it was estimated at 607,995 horse power.

The quantity of solid matter thrown from the crater during the explosive period (April and May) was about half a million of cubic meters. These emissions increased the height of Vesuvius by 33 feet. The highest point previously was 4,221 feet above the level of the sea; now it is 4,273 feet.

I remained on the mountain for three consecutive days, the 11th, 12th and 13th of May. On the 13th, in the morning, there was a copious emission of vapors; toward noon the explosions were resumed, and soon reached a point of extreme intensity. From my position near the border of the crater I was observing the action closely, when I was startled by a formidable explosion, which rained about me a shower of myriads of stones and incandescent scoriæ. I escaped as by miracle. Among the most important phenomena was the complete envelopment of the crater with flames and the multitude of bombs bursting violently in their course through the air. It was a marvelous spectacle. Around me were lapilli, covered with sal ammoniac and scoriæ, with a lustrous patina of metallic appearance, formed of ferric nitrite.

As is known, M. O. Silvestri, stimulated by the experiments of Henri Sainte-Claire Deville, undertook observations on the lavas of Etna, for the purpose of investigating volcanic theories, especially relating to the influence of chemical dissociations, and that he reached very satisfactory conclusions with respect to the genesis of certain nitrated compounds formed within volcanoes.

Thus, by passing a current of chlorhydric acid over reheated iron-bearing silicates, Silvestri obtained water, free silica and ferric chlorides. On heating these chlorides in a current of ammonia there were disengaged besides hydrogen and ammonium chloride, chlorhydric acid and ferric nitrite. Finally, in causing the reaction together, on the reheated lava,

of chlorhydric acid and ammonia (or ammonium chloride), pure hydrogen, chlorhydric acid and ferric nitrite were obtained with separation of sal ammoniac (ammonium chloride).

Without ignoring the great difference between the operations of nature and those of our laboratories, I have no hesitation, in view of my observation of a true isochronism in the production of ammonium chloride and of ferric nitrite in the crater of Vesuvius, in holding, according to the experimental results I have cited, that there exists an intimate genetic connection between these two nitrated compounds of volcanic origin.

The Current Supplement.

The current SUPPLEMENT, No. 1317, contains many articles of interest along many lines. The first page is occupied by an engraving showing the removal of Moreau-Vauthier's statue "La Parisienne" from the monumental gateway of the late Paris Exposition. "The Foothills of Colorado" is by H. A. Crafts. "The Canals of Mars" is by Miss M. A. Orr. "Information Concerning the Angora Goat" is accompanied by several illustrations. "Snow Upon Railways" describes the systems in vogue on the Trans-Siberian Railway. "American Engineering Progress" is continued.

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RECENTLY PATENTED INVENTIONS.

Electrical Apparatus.

COIN-CONTROLLED TELEPHONE.—JULIO E. CORDOVEZ, Panama, Colombia. The characteristic features of this telephone apparatus are a support for the receiver, which support automatically changes its position as the receiver rests thereon or not; a movable coin-support; a circuit designed to be closed by the movement of the coin-support; and a movable coin-retainer operatively connected with the receiver-support and arranged to keep the coin upon the coin-support and to release the coin when the receiver is put back on its support. Thus the introduction of a coin of a certain value is necessary in order to close the speaking-circuit.

ELECTRICAL DEVICE FOR ALTERNATING CURRENTS.—ALBERT NODON, Paris, France. The inventor has discovered that an electrolyte formed of a solution of phosphoric acid to which ammonia may be added and in which are plunged two electrodes, the one of graphite or plumbago, and the other of an alloy of zinc and aluminium, has the property of arresting one of the phases of an alternating current but of permitting the other phase to pass freely. In order continuously to convert the two alternate phases it is necessary merely to arrange two similar couples in parallel, having their electrodes disposed in reverse order. By experiment, it has been found that two similar couples thus arranged can convert alternating currents having a mean electromotive force of 200 volts.

TELEPHONE-RECEIVER HOLDER.—GEORGE S. MEYER, Newburg, N. Y. It has been the object of the inventor to provide a simple device by means of which the receiver will be supported in listening position near the transmitter, so that the hands may be left free to take notes. The arrangement consists of a bar in engagement with and projecting from the transmitter-arm in such a position that the receiver is in proper position for use.

Mechanical Devices.

BALING-PRESS.—ALBERT L. TREESE, Jennings, Oklahoma Territory. With this improvement, the bale formed in an ordinary cotton-press receives a final compression. Mr. Treese prefers to employ his invention as an attachment to a cotton-press. The complete apparatus comprises rotatable baling-chambers which are alternately filled with cotton. A plunger operates in conjunction with one of the chambers at a time to compress the cotton against a platen. A removable follower is designed to be carried by the plunger; and in conjunction with the removable follower a frame is employed, carrying a number of platens to compress the cotton. At one side of the platen a hydraulic device is arranged which can be connected with the removable follower to compress the material finally.

DUMPING WAGON.—THOMAS WRIGHT, Jersey City, N. J. This invention relates to a class of dumping-wagons which discharge the load by tilting the wagon-body rearwardly. The object of the invention is to provide a dumping-wagon of novel construction which is better adapted for the discharge of the

load and the replacement of the tilted body than wagons of its class as heretofore constructed, and which will also permit the ready removal of the wagon-body for the reception of a load and for its subsequent replacement on the running-gear of the wagon.

APPARATUS FOR PRODUCING MOLDS FOR CAST-IRON PIPES.—ERNST FORSTER, 43 Sagorodulji-Prospect, St. Petersburg, Russia. This invention is designed to produce at one operation any number of molds for tubes, pipes, and other articles of regular form and considerable length. The castings made from such molds are perfectly seamless; the molds are not divided either longitudinally or transversely. The time required for making a mold for sixteen pipes does not exceed twenty minutes, it is claimed. The efficiency of the apparatus is, therefore, evident. Further merits are the great exactness and accuracy, and the omission of mold boxes inclosing the molds, thus allowing the molds to dry properly.

MERRY-GO-ROUND.—WILLIAM F. MANGELS, Coney Island, Brooklyn, New York city. The merry-go-round is of that type having a crank-shaft for imparting movement to the seats. The object of the inventor is to provide improvements in the construction of such merry-go-rounds whereby the driving-gear for the crank-shaft is completely relieved of the weight of the revoluble frame. Consequently, undue strain is avoided and the frame is supported independently of the gearing to insure an easy running of the machine with comparatively little power.

TWINE-HOLDER AND CUTTER.—RAYMOND D. WEAKLEY, St. Louis, Mo. The device holds the twine in a suitable carrier. Cutting-blades are brought into action at any time after the twine-carrier has been brought to a position within a casing. The movement of the twine-carrier within the casing is accomplished by the operation of a movable knife. When the twine has been cut, the movable knife is relieved from pressure, and the twine-carrier is automatically carried to its normal position.

MACHINE FOR SETTING CALKS IN BOOTS AND SHOES.—CHARLES R. JOHNSTON, Eureka, Cal. The invention provides a simply-constructed durable machine for calking boots and shoes. The improvements made by the inventor have perfected the construction and increased the efficiency of operation.

CASH-DRAWER.—JULIUS OHMEN, Manhattan, New York city. The cash-drawer comprises a money-receptacle having two locking devices, both controlled by the drawer-knob. One locking device serves to lock the money-receptacle to the drawer, and the other locking device serves to lock the receptacle to a stationary part. An alarm is actuated by the drawer. Mechanism is controlled by the last-mentioned locking device to throw the alarm in or out of action according to the position of the locking devices. The alarm is given when any person not familiar with the construction of the drawer seeks to steal the money.

LATHE-DOG.—PHILIP SCHWICKART, Brooklyn, New York city. The lathe-dog comprises a body having V-shaped members. On one of the members is an extension formed with a

number of recesses located one above the other. A clamping-bar has its fulcrum in one of the recesses. On the free end of the clamping-bar an adjustable bolt is pivoted, engaging a flange on the other body member. Pivoted on the clamping-bar between the fulcrum and bolt is a clamping-block, having concave sides located at different distances from the pivot of the block. Eight different adjustments can be made, thus adapting the lathe-dog for objects of different diameters.

CURRENT-WHEEL.—EVER PETERSON, Spokane, Wash. The water-wheel comprises a supporting-shaft to which a shell is attached. Spokes pass through the wall of the shell and are secured at their ends to the ends of the shell. Blades are attached to the spokes. Forward of the shell is a tapered casing. As the current strikes the taper it is divided and thrown out to strike the several blades simultaneously; thus the eddies of the stream will be overcome and greater power obtained.

Vehicles and Their Accessories.

BICYCLE-SUPPORT.—EVEN MILLER, Fredericton, New Brunswick, Canada. The bicycle-support comprises essentially a supporting frame on which a rack-bar is movable. Gear-wheels engage the rack-bar. On the gear-wheels supporting-legs are carried, by the movement of which a wheel-engaging device is operated. The supporting-device is simple in its construction and can be very easily adjusted.

WHEEL.—OTTO TEIGEN, Lowry, Minn. The purpose of this invention is to provide a vehicle-wheel which will yieldingly support its load. To this end the invention embodies a wheel with its rim and hub connected by longitudinally-extensible and contractible spokes hinged in place and provided with springs which have their ends respectively connected with the hub and rim.

SPEED-GEAR.—SEBASTIAN M. WADE, Anderson, Ohio. This invention is a means for transmitting motion and for varying the speed and direction of motor-vehicles. The gearing comprises two worms driven in the same direction. Between the worms is a double-bevel worm-wheel movable to engage either worm. A spur worm-wheel is movable to engage one of the worm-wheels, and a crown worm-wheel is movable to engage one of the worms.

Railway Appliances.

TIE.—HIRAM STOUT, Kingman, Kans. The railway-tie comprises a pair of hollow stringer-blocks made of clay, to which blocks a tie-bar is bolted. Wooden chairs receive the rails and are interposed between the blocks and rails and have recesses at their under sides to receive the ends of the tie-bar. The chairs form cushions for taking up the vibration and also prevent wear on the clay blocks.

CONVERTIBLE FREIGHT-CAR.—OSCAR B. CRITCHLOW, Leadville, Colo. The car is so constructed that it can be conveniently converted from an ordinary flat-bottom box-car for carrying freight to a hopper-bottom box-car for carrying grain. The floor for the car-body is made in sections arranged to extend either in a horizontal position on the floor-supporting timbers, or to hang with their

outer ends on the supports and extend from the car-body inward and downward to the floor-members at or near the middle of the car. A conveyer-casing has a conveyer-screw at the middle of the car into which the floor-sections discharge. Slides for closing the casing are controlled from the outside of the car.

LOADING DEVICE FOR RAILWAY-CARS.—WILLIAM P. PORTER, East Jordan, Mich. By means of this apparatus railway-cars can be loaded without being side-tracked. The machine employed comprises a platform on which a motor is carried. A transverse shaft is geared with the motor. With the transverse shaft longitudinal shafts at the sides of the platform are respectively geared. Keepers are carried at the sides of the platform. In the keepers, uprights are slidably mounted, which uprights carry racks engaged by pinions on the longitudinal shafts.

Miscellaneous Inventions.

SUPPORT FOR BUCKETS.—JOHN LOWE, Arlington, Kans. The bucket is to be used in milking, and for that purpose is provided with supporting devices which can be attached to the knees of the milker, so as to leave both hands free. When the bucket is not in use the supporting devices can be carried close to the side of the bucket.

ARTIFICIAL TOOTH.—WILLIAM K. SLATER, East Tennessee National Bank Building, Knoxville, Tenn. The invention comprehends the formation of artificial teeth in which keepers are baked projecting above the gum ends of the teeth in the direction of the longitudinal axes of the teeth, and are arranged by means of loops or bent ends for secure attachment to a retaining wire. These keepers are located in those portions of the teeth where there is the greatest body of porcelain. The teeth depend almost entirely upon the wire for their attachment to the plate.

WATER-DISTILLING APPARATUS.—DICKINSON L. ROSE, Mankato, Minn. The apparatus is specially adapted for domestic use. The construction comprises a vertical boiler which is open at the top. A condenser is located above the boiler, and a water-reservoir exterior to the boiler. The water-reservoir has an upward extension composed of double walls, separated by a space for receiving the water of condensation, both walls surrounding the boiler, and the outer one being attached to the condenser and forming the outer side of the condensing space above the boiler. The apparatus removes volatile and mineral matter, and effects rapid condensation and aeration.

NUT-LOCK.—SAMUEL S. JAMISON, Saltsburg, Pa. When once applied, the bolt and nut will be locked together without the possibility of being loosened accidentally. To secure this end the inventor employs a nut having a tapered hole provided with a series of independent angular projections. The angular edges are sunk in the bolt end and allow the metal of the bolt to spread into the angular recesses between the angular projections.

PULP-STRAINER.—JAMES W. PACKER, Glens Falls, N. Y. The pulp-strainer for paper-making comprises a fixed support, a diaphragm to which a plunger is secured, and a cam for operating the plunger. An arm