

THE TRUMPETERS.

While the Palmipedes and the Gallinacæ give us valuable auxiliaries, some of European origin, such as the geese, ducks and chickens, and others of foreign origin, such as the turkeys and guinea fowls, the waders at present furnish no domestic animal in our regions. But such was not the case in antiquity, for an examination of the Egyptian paintings and monuments shows us that in olden times, in the valley of the Nile, the gray crane was kept in captivity and treated like poultry yard birds. Nor is such the case in our own day, even, in tropical America, where man has been enabled to utilize the intelligence of certain waders, near relatives of the cranes, and make them protectors of poultry and guardians of sheep. These birds, thus domesticated, are the kamichis, the chaunas and the agamis, or trumpeters. The kamichis or screamers, the largest of all, live in a wild state in the forests of Brazil, Guiana and Colombia. In their general form they somewhat resemble the turkeys, but they have a more elongated body and longer legs, and, instead of caruncles, they are provided on the forehead, toward the base of the bill, with a slender horn, which is adherent only to the skin. Besides, near the carpus, their wings are provided with two sharp spurs, with which they are capable of inflicting severe wounds upon their enemies.

The chaunas of Brazil and the Argentine Republic, smaller than the kamichis, have a shorter bill, a relatively heavier body, stronger legs, a glossy plumage much more strongly mixed with gray and white, the forehead deprived of a horny appendage and the nape often ornamented with a tuft.

Finally, the agamis, with which we shall occupy ourselves particularly at present, and which constitute the genus *Psophia* of Linnæus, are of still smaller size, and recall the water hens and the sultans in their rounded form, but are of more graceful shape and have slenderer legs and neck and a more richly tinted plumage. The head is small and regularly rounded, and the bill is stout, with the upper mandible strongly arched and terminating in a hook. The body is ovoid and the tail is very short and formed of soft feathers concealed under elongated and flocculent ones that are usually of a delicate gray passing to dark russet. This light tint of the lower part of the back contrasts with the black color of the rest of the body, and which is relieved upon the breast by green, blue, violet and golden reflections. The head and neck likewise are black and of velvety aspect, and the feathers are shorter and closer than those upon the body and resemble a sort of down very soft to the touch. The shades of the plumage vary somewhat from one species to another and permit of distinguishing the green agami (*Psophia viridis*) from the dark agami (*P. obscura*), the agami with tawny wings (*P. ochroptera*) from the agami with white wings (*P. leucoptera*), and the Rio Napo agami (*P. napensis*) from the noisy agami (*P. crepitans*).

Of all these alleged species, some of which are certainly only local varieties formed at the expense of a name type, the last named is assuredly the one most anciently known. We find it mentioned or described in a more or less accurate manner in the relations of the travelers or naturalists of the 17th and 18th centuries and of the beginning of the present one, in the works of Father Du Tartre, Barrère, Adanson, Pallas, Vosmaer and Buffon, and in the voyage to Surinam and in the interior of Guiana of Capt. J. G. Stedman, who informs us that in his time this species was called camy-camy by the Indians and agami or trumpet bird by the colonists of Guiana. This, by the way, shows us the etymology of the French name agami, which is

evidently but a corruption of the Indian name camy-camy. As for the name trumpeter or trumpet bird, that alludes to the strange sounds that the bird makes, especially when it is frightened, but which only very remotely recall the sound of a trumpet. A piercing cry succeeds for about a minute a dull rumbling, which becomes feebler and feebler. It is a curious thing that after so many years have passed since the species was discovered, and after the agami has been the subject of numerous works, naturalists do not yet appear decided as to how this sound is produced. Trail and Poeppig supposed that it resulted from the vibration of the air that the bird, keeping the bill closed, causes to penetrate from the lungs into two pockets communicating with the trachea through two narrow slits, and comparable in all respects to the vocal sacks of the Caosar emen; but the recent re-

In their gait the agamis much resemble the cranes. Like the latter, they have sudden fits of gayety, during which they execute dances that contrast singularly with their ordinary gravity. When pressed by danger they are capable of running swiftly, but their flight is so heavy and so slightly sustained that they cannot, by wing, cross a river of any great width. After the young are fully grown, they continue to live in families for several months, and, like many other waders, usually unite with other bands of the same species in order to constitute flocks that often include forty individuals, and that sometimes, even, if Schomburgk is to be believed, comprise as many as 2,000 heads.

The agamis have, for more than a century, been very actively hunted for in Guiana, not on account of the quality of their flesh, which is always hard and dry, but for the value of their plumage, the brilliantly colored and chatoyant parts of which are used for making ornaments. Such hunting is so much the more profitable in that the agamis are unable to fly to a great distance, and, moreover, are easily attracted up to the gun when one succeeds in imitating their cry. When captured alive they readily get used to captivity and are easily tamed.

They are found entirely free, says Schomburgk, in all the Indian establishments. They serve as guardians to other birds. In the last century Mr. De la Borde wrote to Buffon that agamis were to be seen wandering about the streets of Cayenne, leaving the city and coming back home at night. They may be approached and handled as much as one wishes, said he, and they fear neither dogs nor birds of prey. In the poultry yard they render themselves masters of the fowls and make the latter fear them.

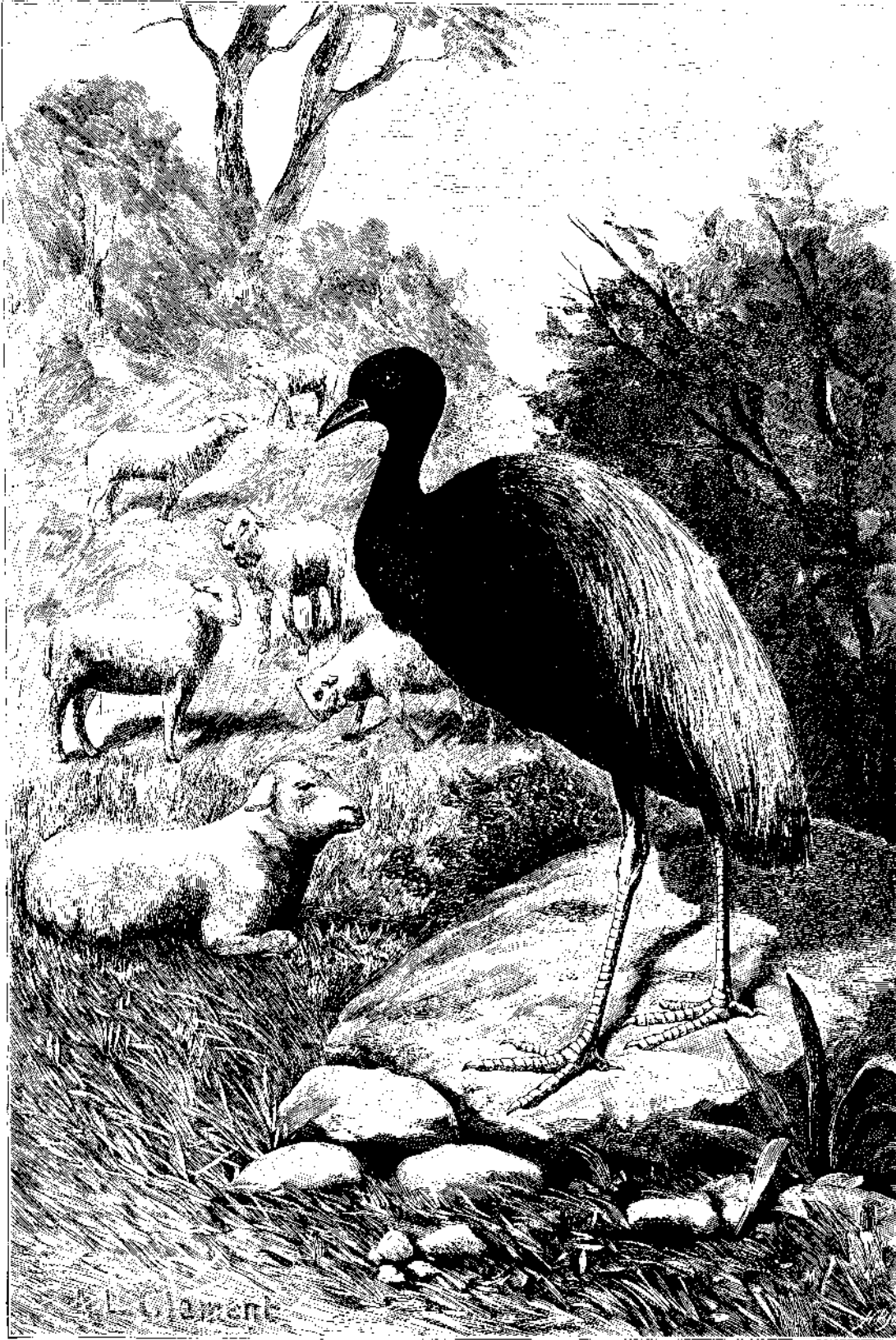
Almost all these birds have the habit of following some one in the street or out of the city, even persons whom they have never seen. It is in vain for one to hide or to enter a house. They will wait for him and always return to him, sometimes for more than three hours. I have sometimes began to run, added Mr. De la Borde, but they ran faster than I and always got ahead of me. When I stopped they stopped also, and very near me. I know of one that never fails to follow every stranger who enters the house of its master and to follow him around the garden until he leaves.

Mr. De Manoncourt, another correspondent of Buffon, Pistorius, Vosmaer, Stedman, Schomburgk and many other authors, ancient and modern, that we might mention, agree in recognizing the intelligence and docility of the agamis reared in captivity. These qualities, moreover, have been observed even in individuals brought to Europe at various times during the

last century and preserved for several years in the zoological gardens of France, England and Holland. These birds become attached to those who take care of them, obey their voice, follow them docilely or precede them in frisking like dogs, and manifest their joy at seeing them again after an absence of some little time. They like to be caressed, and show themselves jealous of those who share the good graces of their master. When an agami has been allowed to put foot in a house it tries to drive away the cats and dogs that give it umbrage, approaches the table at meal time without invitation and does not fail to strike the black servants with its bill.

In the poultry yard these birds soon exercise their domination over the fowl therein, and it appears, even, that it has been possible at times to make them play the part of shepherds' dogs and to charge them with guarding flocks of sheep.

Even though the exactitude of these facts were not attested by authors worthy of credence, we should be



THE AGAMI OR TRUMPETER OF GUIANA.

searches of the English naturalist Beddard have not confirmed this hypothesis. It appears that the trachea of the agami possesses no lateral slit, and does not present, at least not always, the circumvolutions mentioned by Hancock.

These agamis live in a wild state in the great forests of Guiana and that part of Brazil situated to the north of the Amazons.

They make their nest on the ground, or, more accurately speaking, they content themselves with scratching the earth with their claws at the foot of a tree, thus making an excavation which they line with grass and in which they lay a dozen eggs of a light green color. The young are very robust, and, scarcely freed from their shell, begin to trot along behind their parents. They feed at first upon insects and worms, but soon add fruits and seeds to this animal food. They remain covered for quite a long time with a soft dense down formed of fine feathers resembling hairs and very different from the feathers of the adult.

disposed to concede that the agamis are susceptible of a certain education, for we know that a few years ago, at the Garden of Plants, a Numidian crane, that is to say a bird belonging to a family very closely allied to the agamis, conceived a very strong affection for its keeper and obeyed him like a dog. One day, even, when the keeper had taken sick, the bird, uneasy at not seeing him, went to his house, to which it knew the way on account of having gone thither several times in his company.—*La Nature*.

Arrowroot Manufacture in Queensland.

The manufacture of arrowroot is carried on extensively in the south of Queensland. In the districts of Coomera and Pimpana there are from 250 to 300 acres under cultivation, the chief plot—that known as "Rockholm"—being the property of Mr. Samuel Grimes. I recently visited this representative plantation, a description of which will serve to convey an idea of the whole.

The arrowroot grown in this district is the purple variety—the *Canna edulis*. It sometimes grows to a height of 8 feet, bears a pretty scarlet flower, and a dark purple seed pod follows, which is generally sterile. The best variety of arrowroot, the *Maranta arundinacea*, which is grown so extensively in the Bermudas, thrives well in this district, but its cultivation has been almost abandoned, owing to the difficulty of manufacture. This kind attains a height of 2 feet, and bears at maturity a small white flower somewhat resembling potato blossom. The mode of cultivation is as follows:

The ground is plowed in ridges of about 46 feet wide, and thoroughly harrowed and scarified. Nine rows are placed in this, 5 feet apart, leaving six for the row in which the by-furrow comes. Shallow furrows, 5 inches deep, are run with the plow, after which the smaller bulbs—about the size of a small apple, which are found growing at the bottom of the stems—are placed 4 feet 6 inches apart in the drill, and covered by turning a furrow from each side on to the top of the bulbs. Cultivation is then carried on by keeping it clear of weeds by means of horse hoes or "scufflers." When it reaches the height of about 3 feet the space between the rows is turned up with a one-horse plow, the soil thrown toward the plant, and a furrow left in the middle. No further attention is required till the arrowroot is dug up for the mill. When the tubers have come to maturity, which is generally in ten

months or a year's time, the crop is ready. The stalks of the plant are then cut off as close as possible to the tubers with a cane knife or strong reaping hook. The tubers are afterward raised with a grubbing hoe or mattock. They are placed with all speed in carts and conveyed to the mill, for the color is seriously affected by being exposed to the sun or weather before grinding. Sometimes as much as 50 pounds weight of tubers is obtained from the plant.

The machinery consisted in this case of a 6 horse power engine made by Messrs. Manlove, Alliott & Co., Nottingham, a root washer, grinding mill, cylinder, sieves for separating the farina from the fiber and pulp, and a centrifugal drying machine. The roots are washed in a trough 10 feet long, 3 feet deep, and 2 feet in diameter. This has a half-circular bottom, through which a stream of water is constantly running. A spindle having pegs about 4 inches apart, and of a sufficient length to reach within an inch of the bottom and sides, revolves in the trough. The pegs cleanse the bulbs of all dirt, and the latter gradually work down to one end of the trough. A wooden rake pushes the bulbs out upon a belt elevator, whence they are conveyed to the hopper of the mill. This is a wooden drum, 2 feet 6 inches wide and 2 feet in diameter. It is covered with a galvanized iron sheet punched and placed with the "burr" on the outside. The drum revolves at a high speed, and a stream of water falls upon it from tanks fixed above.

Thus the bulbs are grated up, the bulbs and the water passing through the sieve No. 1, which is a cylinder 8 feet long, with the bottom half perforated with holes about the size of a No. 7 wire nail. Within this a beater revolves, forcing the water and farina through the holes, and being placed on the screw the pulp and fiber are forced out at the end. The farina and water pass into sieve No. 2, which is similar to No. 1, except that the holes are about the size of a large pin-head in the bottom of the copper. After this it runs along a trough, where the farina is deposited and the water passes off. The farina is now dug out, and passed through sundry more sieves, and washings by hand and in tubs, then finally left to subside. When fairly firm it is taken out and passed through a centrifugal machine. It is now placed on the drying frames, about 6 feet long, with marsupial netting and calico stretched upon them. They are placed away from any dust or smoke, and the wind passing underneath, as well as the sun above, aids the drying process. But the sun

and air are not alone depended upon for drying, Mr. Grimes having erected a drying house capable of accommodating 180 frames. This is heated by means of steam pipes to 140° Fah.—*Industries*.

United States and Europe in 1893.

The United States is not in the least dangerous to us in connection with military affairs. But from an economic point of view it constitutes an immediate and pressing menace. The debt contracted by the United States during the war of the secession will be completely extinguished before the end of the century, whereas the total debt of European countries is estimated at the enormous sum of 126,000,000,000 francs. The United States has an army of only 27,000 men, that is, scarcely as many as we have in one of our nineteen corps. In comparison with these 27,000 men, place the 3,500,000 soldiers kept by the European countries in time of peace, and it is easy to see how much of their productive force the European powers annually sacrifice.

It must be taken into consideration that the men thus taken from the peaceful employments are all in the height of their activity and at an age when the character is forming. The loss of revenue which results from such a state of affairs is frightful when it is looked upon as a factor in the industrial war with the United States. One must be blind not to see, in these conditions of rapid and progressive development of the United States, that Europe is threatened with such a competition that there will come a time when the balance of industrial power and political influence must be placed to the profit of the New World. That movement threatens France more than any other European nation, because France carries the heaviest load and has the largest debt. Everywhere in Europe, even among the smallest states, nothing is spoken of at present but armies, the increase of war materials, and, of course, new taxes.—*Figaro*.

Sawdust Building Bricks.

The sawdust is dried and screened, to remove the coarser particles, and is then mixed with cement, lime, and sand in the following proportions: One part cement, two parts lime, five parts sharp sand, and two parts sawdust. The sawdust is first mixed dry with the cement and sand. The final mixture is pressed into blocks, which are said to be cheap and useful. There is as much lime and more than twice as much sand as sawdust in them.

RECENTLY PATENTED INVENTIONS.

Engineering.

BALANCED SLIDE VALVE.—Daniel Kiley, Brooklyn, N. Y. This is an improvement on a formerly patented invention of the same inventor, relating to slide valves having their top surfaces protected from direct contact with the live steam that enters the steam chest from the boiler, and provides a simple relief valve attachment for the valve, to cause it to operate more reliably and prevent accident.

DREDGING APPARATUS.—James B. Quinn, New Orleans, La. A swinging frame hinged to a support carries an excavating wheel having buckets and discharging cells, the wheel being connected with a driving drum and cable, the latter being controlled by an adjustable tension device, while there are mechanisms for raising and lowering the frame to give the wheel any desired angle to the support. There are no joints or bearings subject to abrasion by the grit stirred up by dredging, the buckets are built to be very durable and automatically discharge their loads at the right time, and the apparatus is designed to be operated with comparatively little power for the work it can do.

FLOATING SUPPORT FOR DRILLING DEVICES.—Adoniram Fairchild, New York City, deceased (Benjamin D. Fairchild, administrator). Upon a hollow float is a truss frame supporting a second float, there being a derrick frame on the upper float, which supports ballast weights, while there are flexible connections between the weights and floats, and devices on the top float drawing on these connections. The invention affords a simple and practical means to neutralize the lifting force of wave action on a floating support for the drilling apparatus used to perforate the rock bottom of a harbor or other body of water.

Railway Appliances.

SWITCH OPERATING DEVICE.—Benjamin Bartelmes, Brooklyn, N. Y. This is an improvement especially adapted for use on cars of cable railways with intersecting lines on which cars are drawn by horses, the latter being switched onto and off the cable road, and liable to leave open switches from the cable road to the divergent side track. The switch adjuster consists of a vibratable presser bar carrying on its outer end a rotatable presser wheel, operated by an upright shaft on the platform, by means of which the gripman of a cable car will be able to close an open switch in advance of the car.

STREET RAILWAY SWITCH.—Daniel F. Doody, Brooklyn, N. Y. This is an improvement in that class of switches adapted to be thrown by means of an actuating bar or like attachment on the car. Combined with two sleeves mounted to partially rotate and fitted one within the other, and located in a box-like structure beneath the track near the switch, is a switch lever connected with the inner one of the sleeves and with the switch point, arms adapted to be tripped by the trip arm carried on the car being made in separable sections and extending radially from the outer one of the sleeves.

Agricultural.

CULTIVATOR.—Henry Eastman, Racine, Wis. This is an implement adapted for use in working listed corn, and is supplied with runners to protect the corn, shovels to tear down the ridges, and cutters to remove weeds from the rows and direct the loosened earth toward the runners and the rows of plants. The runners may be readily adjusted to and from each other, and the shovels arranged either laterally or vertically, while adjacent to the shovels are balance rollers adapted to travel upon the ridge acted upon by the shovels, these rollers serving as guides to the machine and to preserve its equilibrium.

Miscellaneous.

BOAT STOPPING DEVICE.—Pedro Samohod, Lima, Peru. On the bow of the vessel is a post carrying a vertically sliding frame having on its sides pivoted wings adapted to extend transversely to present a large resistance surface to the water, as the frame is immersed, its normal position being raised, with the wings closed forwardly. The frame is raised and lowered by means of chains connected with a winch, and is let down when the vessel is moving into a dangerous place, or is liable to collide with another vessel or iceberg, etc.

STONE PLANER.—Charles Biganess, Quincy, Mass. This is an improvement in that class of stone-dressing machines having cutters which reciprocate and revolve simultaneously. The reciprocating and revolving shaft carrying the cutting plates has on its end rounded heads fitted by sockets in oscillating levers connected with an eccentric to oscillate the levers simultaneously. The planer shaft is revolved at a high speed, and a worm and gear mechanism makes the reciprocating movement very slow, whereby the cutting plates will be brought in contact with the entire surface of the stone, to plane it perfectly.

PRESSURE REGULATING VALVE.—August Heithecker, Brooklyn, N. Y. This valve is especially designed for reducing and regulating the pressure of gas or other fluids. Its casing is made up in two separable parts held together by screws, the construction is very simple, and there is nothing about it liable to get out of repair. The tension of the valve-closing diaphragm is regulated by a spring and screw arranged to be very nicely adjusted.

LIFE PRESERVER.—Michael O'Hara, Pittsburg, Pa. The body of this device has upper and lower series of vertical metallic tubes and intermediate horizontal semicircular tubes, with fastenings, and boxes on the breast portion, the whole adapted to be made in the form of a garment, and be light and comfortable to the wearer, while affording receptacles for food and drink.

BURGLAR AND FIRE ALARM.—William C. Dillman, Brooklyn, N. Y., and George A. Seib, New York City. This is a positive working apparatus which operates as an ordinary messenger call, and may be operated by the opening of a window or door to ring an alarm at the central station. It has automatic mechanism for shifting the device from a burglar alarm to a

messenger call after the burglar alarm has been operated, and it may also be connected with any thermostatic or thermometric circuit breakers or closers to ring in an alarm in case of fire. The apparatus may be manually operated when desired without interfering with its electric mechanism.

TROUSERS HANGER.—Joseph A. Jourdan, Paris, France. This device has two integral main sections, each bent from a wire rod into two spring limbs that normally diverge, there being clamping devices on the ends of the limbs and a connecting sleeve having opposite flanges bearing on hanger loops on the main sections. A hanger hook engages the bowed ends of the loops, and sliding rings on the main limbs are adapted to press the fingers together. The device holds the garments stretched to permit its suspension in an unwrinkled condition in a wardrobe or show room.

PARALLEL RULER.—Alexis F. Gillet, Kearney, Neb. This instrument has a base support or rule along which is movable an angle holder having a transversely movable clamp section by which to secure the angle, and a step-by-step feeding mechanism for advancing the holder along the rule. The improvement is designed to enable an amateur to space section and similar lines with as great accuracy as a skilled draughtsman, while it will be useful to the latter in facilitating the rapid drawing of the lines, as the spacing may be accomplished automatically.

WAGON AXLE.—The same inventor has also obtained another patent for an axle to be used on farm implements and wheeled vehicles generally. A spindle sleeve is provided for squared or other non-circular axles, the sleeve having its inner end slitted and having at such end a tapered threaded portion on which is turned a tapered nut. The sleeve, which may be made of any suitable metal or composition, is designed to receive all the wear of the wheel, and it may be cheaply replaced when worn.

SPONGE MOISTENER.—James S. McClung, Pueblo, Col. This is a device especially adapted for use in a school room, enabling one person to properly moisten a number of sponges in a convenient and expeditious manner without bringing the hands in contact with the water or with the sponges. The device has a partitioned compartment in which is held a table and a pivoted presser plate, and may be readily carried from desk to desk by a child, to moisten and return the sponges used at each desk, the sponges being handled with pliers.

CHALK RAIL FOR BLACKBOARDS.—Willard S. Terry, Hilo, Hawaii. This rail is made in the form of a hopper-shaped receptacle having in its bottom an opening connected with an exit tube, the top of the receptacle having an aperture covering. The device supports crayons or chalk, but useless particles and dust pass to the receptacle below and are thus prevented from settling on articles in the room or being inhaled by persons in the room.

FRAME.—Heinrich Schuessler, College Point, N. Y. A simple and durable frame to hold and lock a picture, looking glass, cards or other articles, is provided by this invention. An open casing held on the back of the frame is adapted to receive the article, and a

spring plate fitting in the casing presses the article on its entire back surface, a locking device fastening the plate to the casing, and effectively preventing shifting or displacement.

GUITAR.—John F. Stratton, Brooklyn, N. Y. The performer may, with this improvement, quickly change the stringing of the instrument by using either gut or metallic strings, at the same time increasing the volume and purity of the tone when metallic strings are used. An auxiliary bar or lever is secured to the bridge and engages the strings at the top in the rear of the bridge fret. By using a tail piece in connection with the bar, the strain on the resonating top of the instrument is transferred to the side, so that the top is not liable to warp.

CLASP.—Joseph F. Chatellier, New York City. This is a device for conveniently suspending hose and other wearing apparel and other articles. It has a fixed and a hinged swinging member, and the clasp is opened by moving a button out of a slot, to permit of swinging the hinged member away from the fixed member. The device is very simple, and will conveniently engage or disengage articles without tearing or injuring them.

FRUIT PITTER.—James L. Hall, Kingston, Mass., and Frank H. Chase, Grand Rivers, Ky. This is a device for conveniently removing the stones or seeds from small fruits, especially raisins. It has a wooden handle from which extend a series of elastic prongs or fingers having enlarged heads, and preferably made of round or flat steel wires or rods, a thin perforated plate or seed discharger sliding on the fingers. The fingers are forced through the skin and pulp, and are thus designed to engage the seeds, which are removed from the implement by the sliding perforated plate.

COVER FOR POTS, PANS, ETC.—David D. Davies, Wilkesbarre, Pa. This cover has a central steam escape opening, with an adjustable valve or cap to vary the size of the opening or close it altogether, a spring automatically holding the valve in adjusted position. Applied to a frying pan, this cover enables cooking to be done without greasing the stove or stewing the food, and as a ventilating pot cover it diminishes the escape of steam and tends to prevent the boiling over of water.

WIRE STRETCHER AND HOLDER.—Adolf Westmeyer, Pacific, Mo. Upon the handle of this implement are dogs adapted to clamp the wire, while upon its shank is a pivoted, bent fulcrum block on which a hook bar is movably arranged. The device forms a simple tool for stretching fence wire and holding it taut while being made fast to a post.

RIDING SADDLE.—Ferdinand E. Du Moulin, Joliet, Ill. This invention consists of an attachment comprising a fork, a knee horn detachably and adjustably secured to the fork and provided with an arm, and a leaping horn detachably secured to the arm of the knee horn. By means of the improvement the saddle may be quickly converted for use as a lady's riding or side saddle, the knee joint and leaping horn being located either at the right or left of the tree, or it may be readily changed for use by a man. When used as a