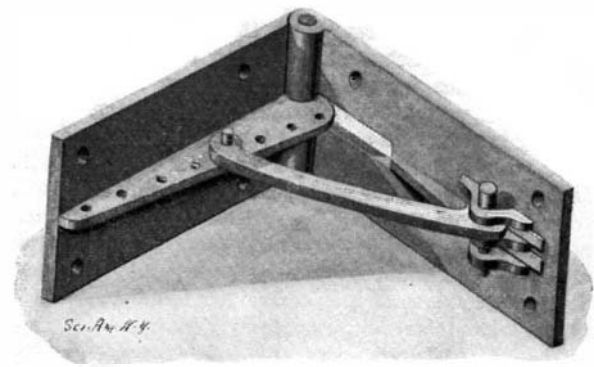


found them too tough. Notwithstanding their pacific name these insects are fierce fighters, and it is in battle chiefly that the female uses her wings. Then she raises them and springs upon her foe. The loss of a head, or a leg or two, or even a portion of the body does not quench the fiery nature of a fighting Mantid, but they may go on battling in this condition for hours. The females are the larger and hence have an advantage over the males, often devouring her mate as he advances to court her.

The Mantidæ are a venerable family, the name Mantis meaning prophet. According to Anacreon they foretold the coming of the spring, and holding up their forefeet in prayer, were ever supplicating the gods.

Almost all Oriental nations have legends about this singular insect, and in South Africa they are known as the Hottentot's God. The Hindoos venerate its



A LOCKING-HINGE.

supposed powers of sanctity and soothsaying, and indeed wherever this insect is found are also found superstitions which make the killing of one a crime. If one is found in a position of danger it is always carefully removed out of harm's way. Even the "unspeakable Turk" recognizes what greatly resembles an attitude of prayer, and accordingly treats it with respect and attention, believing it a fellow-worshiper with himself.

The only sound we have observed it to make is a sort of scraping. This is caused by rubbing the wing with the hind leg, and seems to be somewhat of the nature of a call to battle.

It is not likely that it will ever be absolutely determined how this valuable addition to our insect inhabitants was brought to Rochester. This city is one of the greatest nursery centers in our country, and young trees and plants are imported in great quantities. Whether the insect came in its adult state, or whether some egg-cases were the means of its introduction, will probably never be known.

It must have been here several years before it was first noticed, for it is found in considerable numbers, and is slowly increasing its area. It has crossed the Genesee, and we found this fall a number of cases in one of our parks, placed as high as four feet from the ground. The egg-cases are made in August, survive the winter and are hatched out the following May, so the greater part of the insect's life is spent in the egg. While it is in the adult state, however, its industry is untiring.

It is interesting to note that in a large nursery near Philadelphia another Mantid has become established. This is an Oriental variety, and a native of China and Japan. Its value is known, and it is carefully protected so that it may increase.

There is no reason why the *Mantis religiosa* should not gain a firm foothold in this country. Geographically it is five or six degrees south of what is its northern limit in Europe. Every creature which helps even in a small degree to keep down the many insect pests like grasshoppers, mosquitoes, and flies, should be encouraged, and we are prepared to welcome this stranger within our gates and make him feel at home.

Telephoning Without Wires.

M. Gautier announces that the first step has been made in the discovery of wireless telephony. He ascribes the discovery to M. Maiche, the French inventor, and the experiments were carried out in the forest of St. Germain. The transmitter was placed in a house on the outskirts of the forest, and it was connected with the earth in the same manner in which lightning rods are connected. Two iron posts, ninety feet apart, connected by wire, were planted in the ground about a thousand yards distant. Voices and other sounds at the transmitter were clearly heard at an ordinary telephone receiver attached to one of the posts. M. Maiche claims that the communication is in a straight line and not by wave current, but by a circuit current, thus enabling a given spot to be aimed at. If the receiver is not placed exactly in the direction given at the current, there will be no transmission, and receivers on either side of the line of transmission will not be at all affected.

A NOVEL HINGE.

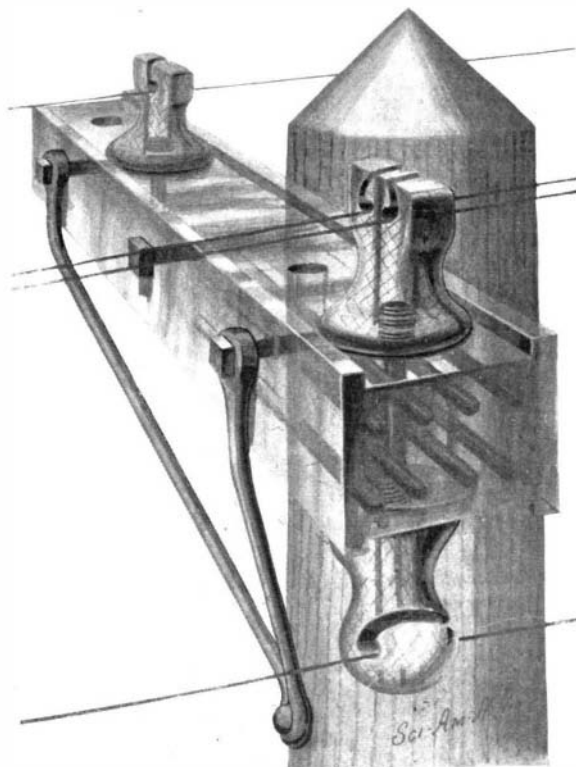
In order that a door may be locked at any point desired, Thomas Wright, of Rome, Ga., has invented the hinge shown in our illustration. One half of the hinge is provided with three superposed lugs, between the upper two of which one end of a lever is pivoted. The other end of the lever carries a pin which can be inserted in one of a series of holes formed in a strip on the other leaf. By inserting the pin in the proper opening of the strip, the door is held open at the proper angle.

Electrical Resistance Metal.

Among the work recently carried on at the Government Physico-technical Institute of Charlottenburg (Berlin) is the study of a new alloy composed of copper, zinc and aluminium, which appears to possess specially good properties for standard electrical resistances. The alloy has somewhat the appearance of brass, and is made by a manufacturer at Achenraiu, in the Tyrol. A metal, to be of value in electrical resistance work, should have a high specific resistance and the coefficient of change of resistance with temperature should be as small as possible; the metal should not form a thermo-electric couple with copper or brass sufficient to interfere with the measurements. The tests made with the new alloy show that its specific resistance is high, lying between 51.70 and 54.08 microhm-centimeters, according to different samples. The temperature coefficient between 18 and 25 deg. centigrade is very small and negative (the metal decreasing in resistance with a rise of temperature); the coefficient lies between the limits -0.00001 and -0.000002 . Measurements of the electrical resistance made between -4 deg. and $+60$ deg. show that the alloy has a maximum of resistance in the neighborhood of 20 deg. centigrade; at low temperatures the coefficient has a small positive value, and at high temperatures a small negative value. The thermo-electric action with copper is very small, this having been found to equal 0.56 microvolt between 20 deg. and 45 deg. centigrade and 0.60 between 20 deg. and 65 deg., for a difference of one degree between the temperature at the joint; this value is exceptionally small, and is less than that of manganin, which is one of the best resistance alloys, the latter giving 1.3 microvolt under the same circumstances, while constantin gives as high as 40 microvolts. As to the change of resistance with time, which is another factor of a resistance metal to be considered, this can only be determined after a sufficient period has elapsed. On the whole, the experiments show that the new alloy possesses valuable properties for the construction of electrical resistance standards, especially for laboratory measurements requiring great accuracy.

A NEW FORM OF INSULATOR.

Insulators made of glass or other fragile material often fall apart when broken and drop the wire. To



THE WOOLBERT INSULATOR.

remedy this evil, Henry W. Woolbert, Box 690, Pittsburg, Pa., has patented a glass insulator comprising two blocks or heads, the upper of which is formed with two incut openings for two wires, and the lower of which is formed with a single incut opening for receiving a single wire. Embedded in each block is a woven wire frame and wires or metal strips. The blocks are secured to a glass arm in which sustaining-wires or metal strips are placed. The device employed

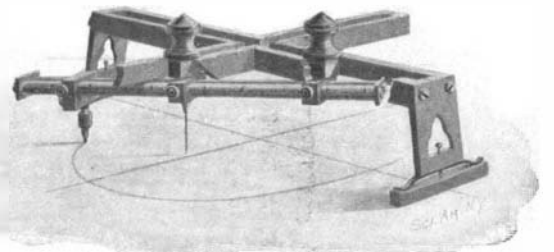
for securing the blocks is a screw-threaded glass bolt, through which wires or metal strips are passed.

By this construction the metal supporting devices are completely insulated from the electric wire. Should any of the glass parts be broken or cracked, the supporting devices will still hold them together.

AN INSTRUMENT FOR DRAWING ELLIPSES.

An ingenious instrument has been devised by Gertrude M. King, of Nantucket, Mass., for describing ellipses with a pen, pencil or cutter.

The instrument consists of a slotted frame, in the shape of a Maltese cross, supported by springs on two standards, so that it can be pressed toward the drawing surface and can return automatically. Beneath the Maltese cross a scribing beam is attached, consisting of two parallel arms, serving as runners for three blocks. The center block, held in place by a screw, covers a needle. The left block can be adjusted along the scribing-beam and clamped by a thumb screw. The right block, carrying the drawing tool, is also adjust-



AN ELLIPSOGRAPH.

able, and can be clamped in any position. The left and center blocks are provided with slide-blocks arranged to move longitudinally in the slots of the Maltese cross.

In using the instrument, two lines are drawn at right angles upon the paper. The right block is then adjusted so that its distance from the left block is equal to one-half the minor axis of the desired ellipse; and the center block is then adjusted until its distance from the right block is equal to half the major axis of the ellipse. The instrument is then arranged with the center point over the intersection of the major and minor axes of the ellipse. The scribing beam is moved with the right hand, while the instrument is pressed with the left. By varying the pressure a light or heavy mark is made. When the pressure has been released, the Maltese cross is carried up by the springs of the standard, so that the drawing tool is removed from the paper.

Count von Zeppelin Honored.

Count von Zeppelin recently delivered a lecture before the Colonial Society in Berlin. He was authorized to announce that the Order of the Red Eagle had been conferred on him, and read a letter in which the Kaiser, after describing Count Zeppelin's achievements as constituting an epoch-making advance in aerial navigation, stated his intention to support the inventor in further experiments by placing the advice and experience of the Balloon Division of the army at his disposal whenever he might desire. Count Zeppelin has certainly earned his decoration, and it is gratifying to see an inventor of a machine for aerial flight so honored, as he necessarily had to brave ridicule for years. Count Zeppelin was very candid in his lecture. He did not disguise the drawbacks of the system—the enormous size of the airship, carrying such a quantity of gas, and the delicate nature of the material of which the ship was constructed—but the fact remains that his airship has successfully attained a great height, carrying with it, in addition to the crew and ballast, provisions sufficient to last over ten days.

Count Zeppelin also has the distinction of having taken part in the famous cavalry raid, in 1870, which was the first blow in the Franco-Prussian war.

The Scientific American an Educator.

For more than half a century the SCIENTIFIC AMERICAN has been recognized as an educator for the old as well as the young. It is particularly gratifying to feel that the youth of the land are being reached and benefited. The following letter was received recently from Mr. G. B. Royer, of Elgin, Ill.:

"A long story short is this: My son, eleven years, over one year ago could not be interested in his school work. We had tried every means. Just why, I cannot say, but one year ago I ordered the SCIENTIFIC AMERICAN in his name. He was interested, became studious, and did so well that his teacher called to ascertain what had been our remedy. I thought I could not afford the paper for the coming year, and my son has earned the money, and wishes to have his SCIENTIFIC AMERICAN continued another year. Please send January numbers."

Judgment in Technical Matters.

In the course of a paper recently read before the Technical Society of the Pacific Coast, by Mr. George W. Dickie, of the Union Iron Works, San Francisco, the author put in an eloquent plea for the exercise of more judgment by technical experts who are appointed to supervise, for the firms or the government that they represent, the construction of work in manufacturing establishments. Mr. Dickie says that he does not know a single university that has a chair of common sense, and that, in trying to account for this omission, he can think of but one reason, and that is the impossibility of finding a man to fill such a chair. The author of the paper protests against the hard-and-fast interpretation which inspectors almost invariably put upon their "book of instructions," and complains that, too often, suggestions offered by the manager of the contracting works, looking to improved methods of executing the details of the contract, are received in an attitude of suspicion, and that these suggestions, in spite of obvious mutual benefit to both parties concerned, are often rejected merely because they do not conform to a literal interpretation of the contract. Mr. Dickie quotes the instance of a small marine boiler, which his firm was building for the Treasury Department, under a very strict specification. Finding that it would be better to weld the plate forming the sides of the combustion chamber—because the riveted seam, as shown in the drawing, came in the way of the stays—he recommended a change, and the inspector agreeing with him, the plate was welded instead of riveted. A slight waste in heating resulted in the plate being 1-32 of an inch thinner at the weld than in the body of the plate. At the completion of the job, the inspector, finding that the plate was slightly thinner at this point, rejected it under instructions from Washington, although, as a matter of fact, the welding had raised the strength from 67 per cent of the plate, if riveted, to 92 per cent, as welded. This is quoted as an instance, not of the desire of the inspector to cause a loss to the contractor, but simply of a failure on his part, or on the part of his superiors, to apply sound judgment to the question before them.

We agree with Mr. Dickie that, in such cases as the above, considered by themselves and apart from the

general principle of inspectorship over contracted work, there is a lack of good judgment; and, no doubt, there are cases when, if the inspectors were allowed a freer hand and the exercise of individual judgment, there would be a saving of cost and vexation to both parties to the contract. On the other hand, it would be a very easy matter to run to extremes, and entirely neutralize the value of inspectorship by giving to the inspector a license for the exercise of his judgment which would enable him practically to supersede a written contract. Such extreme cases as the one quoted above must be regarded as the accidental defects in the working of a system which, broadly considered, is admirable. As between an inspectorship which is rigidly bound to a literal interpretation of a contract and an inspectorship which is entitled to interpret the contract according to its own individual judgment, we think that the former is certainly the preferable extreme. Mr. Dickie's article, which is published in full in the current issue of the SUPPLEMENT, makes out a strong argument in favor of a middle course, in which the inspector, while guiding himself broadly by the contract, is ready to depart from its literal text where one or both parties to the contract would be benefited and the interests of neither assailed.

A Locking Device for Automobiles Wanted.

Quite a number of accidents have occurred with automobiles by reason of unauthorized persons attempting to operate them while they are left at the curb. Some makers of horseless carriages have provided various forms of locking devices, which seem to work admirably, but in most cases there is no reason why a person who is familiar with the particular type of automobile could not operate the carriage. Of course, in certain types of electrical carriages, special locking devices have been provided, which are controlled by a key similar to a door key, but for many other types of horseless vehicles there is really no guarantee that the carriage will not be tampered with. Some carriages are provided with means by which the switches or valves cannot be operated until the driver resumes his seat; but, of course, a device of this kind is only valuable to prevent the carriage

starting accidentally, as, for example, when it was run into by another vehicle. The subject is an interesting one, and affords a considerable field for invention. All carriages should be required by law to have some safety device by which the public will be protected from the dangers of a carriage set into motion by unauthorized or mischievous persons.

The Current Supplement.

The current SUPPLEMENT, No. 1311, has a number of articles of unusual interest. "Primitive Huts of Ostia" and "The Farnese Theater at Parma" are very attractive illustrated articles. "The American Patent System" is a subject of a most important paper by Commissioner of Patents Duell, and it contains very valuable information and statistics. From it we find that Mr. T. A. Edison has received, between the years 1872 and 1900, 742 patents; Francis A. Richards, 619, and Elihu Thomson, 444 patents. "The Prepared Mustards of Commerce" gives a number of formulas. "The Bureau for Testing Paper at the Paris Chamber of Commerce" is accompanied by a number of engravings. "Compulsory Rotation or Positive Driving" is by Prof. C. W. MacCord. "On the Need of Education of the Judgment in Dealing with Technical Matters" is by George W. Dickie. "The Panhard-Levassor Automobile" is accompanied by a most elaborate series of engravings showing the details of mechanism of a racing machine. "The Engineering Works of the Suez Canal" is a valuable treatise. "The Burning of a Baku Oil Depot" is of particularly timely interest, owing to the recent conflagrations.

Contents.

(Illustrated articles are marked with an asterisk.)

Automobile news.....	102	Inventions recently patented....	107
Automobiles, locking device for.....	102	Man, truncated.....	105
Boiler construction.....	98	Mantis.....	105
Boiler, locomotive.....	100	Notes and queries.....	108
Books, new.....	108	Patents, report of Commissioner.....	99
Cask, height of liquid in.....	102	Science notes.....	38
Chinese play, unscientific character of.....	98	Supplement, current.....	107
Cruisers, armored.....	103	Technical matters, judgment in.....	107
Cyclopedia of receipts, notes and queries.....	103	Telephoning without wires.....	106
Educator, Scientific American.....	106	Toads in rocks, survival of.....	101
Ellipsograph.....	106	Torpedoes, steering.....	104
Engineering notes.....	103	Trains underground, vibration from.....	98
England's decadence.....	98	Transmission line, aluminum.....	98
Gas-water, manufacture of.....	99-102	Turrets, superposed.....	98
Hinge, locking.....	106	Vise, pipe and bench.....	101
Inventions, index of.....	109	Water wheels.....	104
		Zeppelin, Count von, honored.....	106

RECENTLY PATENTED INVENTIONS.

Mechanical Devices.

FRUIT-PICKER.—GERHARD L. THUNEN, Oroville, Cal. This fruit-picker consists of two pivoted members, one of which is spring-controlled and constitutes a cutter. The device is to be secured to the first two fingers of the hand in a convenient position over the palm. The cutter-blade is operated by the thumb, so that the stem of the fruit can be readily cut.

APPARATUS FOR FORMING PLATE OR SHEET GLASS.—LAWRENCE H. DOLAN, Pendleton, Ind. By means of this apparatus it is possible to form curved, corrugated or flat sheet and plate glass without the use of a blowing-tube, or without the necessity of pouring the molten glass upon a bed-plate or into a mold. The principle of the invention consists in drawing a wide or narrow sheet or plate of glass from a reservoir containing molten glass; controlling the temperature of the glass as it is in process of formation into a plate or sheet, upon an appropriate forming plate supported upon a frame; and providing means for truing the side edges of the glass sheet or plate and also means for detaching the cooling plate or sheet from the mass of glass in the reservoir.

BOX-MAKING MACHINE.—CARL ENGBERG, St. Joseph, Mich. The machine forms boxes from an endless sheet of paper, metal or other material, and is so constructed that the box blanks are successively cut, their sides and flaps folded into position to form the box body and united by staples, and the finished box discharged from the machine. The box-blank is formed by dies between which the stock is passed by the action of an intermittent feed. A folder receives the box-blank from the device, which folder comprises a form and a reciprocating cross-head. Stapling devices on opposite sides of the folder drive staples through the box sides and flaps.

HOISTING-MACHINE.—EDWARD C. REITER, Rockville, Conn. The purpose of the invention is so to arrange a hoisting-machine that, when the drum is not rotating, the load on the hoisting-cable can be supported and held at any desired point without danger of lowering the load. The mechanism by which this result is attained consists essentially of a crown-wheel carried by a frame mounted to rotate on the hoisting-drum shaft, and a gear-wheel mounted to deflect and to engage two rows of teeth on the crown-wheel. The movement of the drum causes the deflection of the wheel.

CARVING AND ENGRAVING MACHINE.—ATTILIO STERIA, Manhattan, New York city. The object of the invention is to provide a reproducing machine for carving wood, according to a given pattern, but of different proportions. A triangular frame is hung at one apex by a universal joint. One of the sides of this frame is provided with two rectilinearly-moving slides, carrying respectively the

tracer and reproducer-tool. A graduated arm is pivoted to another apex of the triangular frame and is adjustably connected with the tracer slide. An extensible link is adjustably connected at one end with a graduated arm at a point between its pivot and the tracer-slide, and is connected at its other end with a reproducer-slide. The tracer can be readily moved over the pattern by reason of the universal joint. As the slide carrying the reproducer-tool moves in accordance with the movement given to the tracer-slide, an exact reproduction of the pattern is made on the face of the wooden block.

RAISIN-SEEDER.—FRANK H. PETERMAN, Manhattan, New York city. The raisin-seeder has an impaling-pin cylinder, an endless woven fabric, and guides to direct the fabric to and from a portion of the cylinder to engage the impaling-pins and to travel with them during part of the revolution of the cylinder. A deflector between the impaling-pins and the guides disengages the fabric from the impaling-pins. The deflector serves to direct the removed pulp to a receiving-box. Thus the seeds are forced out, without unduly tearing the raisins.

BREAK-LEVER LOCK FOR GUNS.—JASPER L. ACKERMAN, Monon, Ind. In a previous patent granted to Mr. Ackerman, a means for locking the lever of a breech-loading gun was described by which the break-lever was prevented from being opened unless the owner of the gun so desired. In that device a bolt entering the lever was actuated by a rotary barrel turned by a detachable key. In the present invention the same result is accomplished by causing an external slide to lock the lever either through a bolt or by direct engagement, or both, and by so organizing the slide that the safety of the hammerless gun is secured.

CLOTHES-WASHING MACHINE.—WILLIAM M. THOMAS, East Chicago, Ind. This machine for washing clothes is characterized by its simple and inexpensive construction and by its rapid and efficient operation. The machine is so made that all parts can be duplicated or readily repaired, and that the clothes cannot be torn during the operation. The water can be drawn from the tub while the clothes are in the machine, and fresh water supplied. All parts can be readily removed when the machine is to be cleaned.

Miscellaneous Inventions.

APPARATUS FOR FUME-DUST CONDENSATION.—RODOLFO RUCCHI, Argentine, Kan. The invention relates to appliances for mechanically precipitating and collecting the solid matter contained in the fumes arising from metallurgical plants. The fumes pass through a cooling device having narrow chambers, spaced to form a circulating air-space. With the cooling device, a mixing device is connected into which the fumes from the cooling

device pass to equalize their temperature. A suction-fan is connected with the mixing device; and cooling and precipitating cylinders are each connected with a discharge-pipe leading from the fan. Each cooling and precipitating device has a circular water-jacketed channel into which opens the discharge-pipe from the fan. The channel itself leads into a water-jacketed discharge-pipe which carries off the exhaust-gases. Valved-discharge hoppers receive the solid matter from the channel and discharge-pipe.

TEMPORARY BINDER.—CHARLES V. HENKEL, Manhattan, New York city. This invention is a temporary binder designed especially for holding the leaves of a perpetual ledger, that is to say, of an account-book, the leaves of which are removable, so that the same book serves indefinitely for a number of prolonged accounts. The binder has a body on which two clamping sections slide toward and from each other. Guide members are fastened by one end to the corresponding clamping sections, these guide members having a permanent sliding engagement with each other so that they form an unbroken holder for the leaves regardless of the positions of the clamping sections. Each clamping section has an opening, such openings serving to receive the free ends of the guide members to permit these free ends to pass the inner faces of the clamping sections, when the clamping sections are moved together.

DIAL FOR SPRING-SCALES.—FLORENTINE L. KELLOGG, Santa Barbara, Cal. The weighing-scale comprises a casing, a platform, a spindle, projecting from the casing, a pointer on the end of the spindle, and a fixed bearing on the spindle, having a screw-fitted outer end. A dial is mounted to turn upon the bearing and the pointer plays over the dial. A washer on the bearing engages the dial. By means of a nut screwing on the bearing the washer can be forced with more or less pressure against the dial.

HAT-STRETCHER.—JOHN F. KENNEDY, Cripple Creek, Colo. The hat stretcher comprises sections having outwardly projecting top and bottom walls and vertical rollers mounted to rotate between the walls. By reason of this construction strain is exerted in all directions.

TOE-CLIP.—ARNOLD M. BALDWIN, Santa Cruz, Cal. This bicycle toe-clip is so arranged in relation to the pedal that it will fit over the instep of the rider, thus providing a good purchase for an upward pull on the up-stroke of the pedal. A wear-plate is furnished with the clip, which wear-plate is designed to relieve the pedal from undue wear by rubbing of the rider's foot.

DEVICE FOR TEACHING ARITHMETIC.—THOMAS E. BORDEN AND ALFRED A. WALLACE, Minturn, Cal. By means of this device a large number of examples can be readily formed. In a support or frame, rollers are

journalled with a series of tapes bearing numbers. These numbers varies progressively toward one end. Different tapes will afford arithmetical problems of increasing fractions. The device can be used for problems in fractions.

SEE-SAW, MERRY-GO-ROUND, AND LAWN-SEAT.—FRANK L. WRIGHT, Nyack, N. Y. The inventor has devised a see-saw so constructed that the teeter-board has not only a vertical pivotal motion, but also a horizontal motion, a ball and socket connection being provided between the teeter-board and its support to secure both motions. By hinging or pivoting legs to the under side of the board a lawn-seat is formed.

PORTABLE PHOTOGRAPHIC DARK-ROOM.—ALBERT WERNER, Arena, N. Y. Mr. Werner has devised a very convenient dark-room which will probably be extensively used by traveling photographers. The dark-room comprises a main box, having a flexible hood secured around an opening in the top of the box. Sleeves of flexible material are secured around openings in opposite sides of the box. The box is provided with openings in its sides, normally closed by slides. Auxiliary boxes, open only at one side, can be inserted in these openings when the slides are removed, so as to extend outwardly from the main box. These auxiliary boxes are used only for developing large plates.

METHOD OF MAKING SILICO-FLUORIDES.—WILLIAM C. SELLAR, 119A Mount Street, Berkeley Square, London, England. Calcium fluoride or fluor spar is fused together with dry calcium chloride, the resulting cooled mass being then ground in a dry state and mixed with silica or a suitable silicate. The inventor has found by experiment that the yield of silico-fluorides is much greater when calcium chloride is added and that within certain limits an increase of the calcium chloride relatively to the calcium fluoride increases the production of silico fluoride.

BUTTON.—FRANCISCO CLARK, Durango, Mexico. The invention is an improved button of the type in which a hinged head is employed so as to secure a simple and efficient construction in which the head is capable of assuming two different positions—an inserting position, in which it is readily movable, and a securing position in which it is practically locked. The improved button comprises a main head having a shank, a hinged head connected with the shank, and a locking-plunger mounted to slide lengthwise on the shank.

FASTENING DEVICE FOR BUTTONS.—JOSEPH NEVINS AND JOHN E. WHITE, Manhattan, New York city. The inventors have provided a fastening device applicable to any shank-button, which device can be covered with the same material as that from which the garment is made. For example, upon military uni-