to give each trunk an uninjured gall-bladder and duct. The final suturing was done on two planes, the deep peritoneal and the superficial, including the skin and muscular coat.

Fig. 1 shows the point of separation. The severed surface of Rosalina's liver is represented by *a*; *b* is the visible part of Rosalina's gall-bladder; *c* is the pectoral cavity of Rosalina, which communicated largely with that of Maria; *p* is the circular limit of the bridge of the pericardium cut vertically; *pl* is the case of the pleural sac, extending from the side of Rosalina beyond the point of union; the xiphordian appendix is represented by *a p p* and *a p p'*.

The condition of Rosalina after the operation was encouraging; that of Maria, less hopeful. On the second day after the operation, Maria's pulse ran up to 160, her respiration to 56, and temperature to 38·5° (C.) The condition of both children improved on the third day; but it was necessary to give Maria inhalations of oxygen at midnight. On the fourth day Maria was weak and could take no nourishment; but she improved after oxygen had been administered. The fifth day saw Rosalina in good health, and Maria improved. In the early part of the sixth day Maria seemed in so favorable a condition that she was pronounced out of danger; but fits of vomiting, although checked, weakened her so much that she was unable to rally under the supportive treatment given her. She died at 1:30 A. M. of the following day. An autopsy revealed an inflammation of the pleura and pericardium, with more or less exudate from each, but no inflammation of the peritoneum. The liver as well as all the external wounds were completely healed.

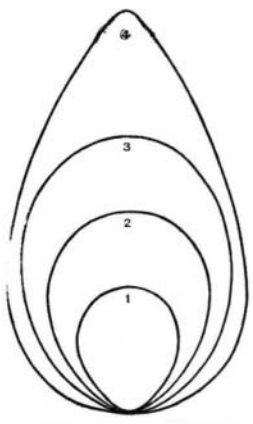


Fig. 1.—COMPARISON OF NOTABLE XIPHOID CASES.

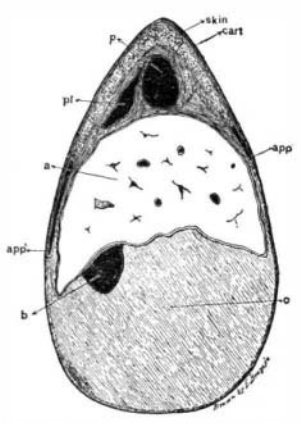


Fig. 2.—DIAGRAM SHOWING THE POINT OF DISSECTION OF ROSALINA AND MARIA.

Drawn especially for the SCIENTIFIC AMERICAN under the supervision of Dr. Chapot-Prevost by Prof. E. Braga.

Rosalina is now in excellent health. On August 16 she sailed with Dr. Prevost for Bordeaux.

Remarkable as the case of these twins may be, it is not the first of its kind known to medical men. As far back as 1834, Cruveilhier studied a double female fœtus brought to his attention by a Dr. Jolly. This curious phenomenon is shown in Fig. 3. The thoracic viscera of this fœtus are shown in Fig. 4. The twins were joined at the anterior portion of the trunk down to the sub-umbilical region of the abdomen. The two sterna were entirely independent of each other. Each fœtus had a thymus and two lungs; but the two hearts were merged into a single organ, horizontally located and imperfectly symmetrical. The right half of the heart was inclosed in the thoracic cavity of the right fœtus; and the left half in the thoracic cavity of the left fœtus. The upper concave portion conformed with the base of the thorax on the line of the xyphoid appendices; the lower concave portion rested on the diaphragm. There were four auricles—two on the right (an upper and a lower), and two on the left. The upper left auricle and the lower right auricle were much larger than the other two. In the illustration the aorta of the right side and the aorta of the left, the vena cava superior and inferior, are clearly shown.

A single diaphragm formed by the union of the two diaphragms was pierced by the two inferior vena cava.

There were two stomachs, two duodena, two pancreas, two ilea, two cœca, two appendices, two large intestines. But there was only one jejunum and one liver, with the anterior and posterior portions located, strange to say, in the epigastric region.

The case of Cruveilhier's twins in certain respects is similar to that of Rosalina and Maria.

In Fig. 1 we have graphically compared the most important xyphoid cases which are recorded in the history of medicine. The diagram indicated by 1 represents the case of Marie and Adele; 2 pictures the case of Chang and Eng; 3, that of Rodica and Doodica; 4, that of Maria and Rosalina.

In conclusion we desire to express our acknowledgment to E. Braga, Jr., formerly professor of mathematics in the College of Braga and professor of history and natural science in the College of Cuanberg at Rio de Janeiro, for information from which the above article was prepared and for the photographs and drawings which he has kindly furnished us. The drawings were made by Prof. Braga especially for publication in the SCIENTIFIC AMERICAN.

III. SIMPLE ELECTRIC MOTOR.

BY GEORGE M. HOPKINS.

Almost every young amateur mechanic is desirous of making something having the ability to move and show action. An electric motor does this; and while the mechanic is making a good piece of machinery, he is also learning the principles of electricity.

The motor we shall describe is intended to turn a fan or light machinery by means of a current derived from a battery. It will drive a light sewing machine or other machinery requiring a similar amount of power, and it is so simple as to admit of being constructed with the tools ordinarily possessed by an amateur.

To begin a motor at the right point is very important. The first thing to be done is to construct the armature—the part which revolves. On account of its simplicity, we have selected the Gramme armature.

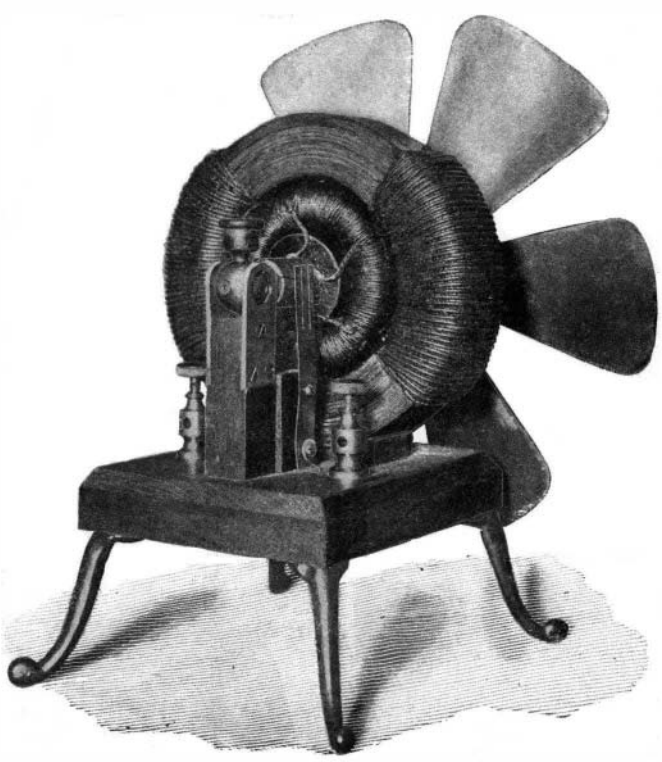
The core of this armature consists of a ring formed of No. 24 sheet iron. A strip ¾ inch wide and 8 feet long (the length of a sheet) is carefully cut from the sheet and wound upon a cylindrical piece of wood in the lathe or by hand. The wood cylinder is 1¾ inches in diameter and 1 inch thick, and in the edge is cut a shallow notch of a depth equal to the thickness of the sheet iron, as shown in Fig. 2. In the iron, ⅛ inch from the end, is drilled a hole countersunk to receive a wood screw which passes through the sheet iron into the wood, and fastens the end in the notch in the wood. The sheet iron thus attached to the wood may be wound closely around the wooden mandrel without a kink being formed by the inner end of the strip, which is in the notch.

Before beginning the winding, a piece of strong annealed wire, stove-pipe wire for example, is placed in a handy position, and when nine layers of the iron have been wound the strip is cut off and the binding wire is wrapped around the coil and twisted together at the ends, to keep the sheet iron from unwinding.

The wood and the coiled sheet iron are together removed from the lathe (or vise if it is being done by hand), and placed in a fire, which will heat the iron to a cherry red and burn out the wood. The ring is then covered with ashes and allowed to cool slowly. This anneals the iron, and improves its magnetic permeability.

After removal from the ashes, and while the binding wire is still in place. the ends are secured by passing rivets through them; the inner end, which was bent, is cut off, and the ends are beveled with a file, and all the sharp corners are reduced by the same means.

The core of the armature is then covered with adhesive tape (either electrical or bicycle tire tape), when it is ready to receive the magnet wire with which it is to be wound. The ring is divided into five equal sections, and marked with a pencil to show how much space each coil of the armature is to occupy. There are five coils on the armature, with five layers in each coil. No. 21 single or double cotton or silk covered wire is used. It requires about 28 feet of wire for each coil. The winding is a slow and rather laborious process. The length of wire for a coil is wound on a sort of shuttle-stick ¾ inch wide, 12 inches long, with a notch in each end. The end of the wire is wrapped twice or three times around the ring over a piece of stout thread, which is tied around the wires to fasten them together, to begin a coil. Of course, the beginning is at one of the marks on the ring.

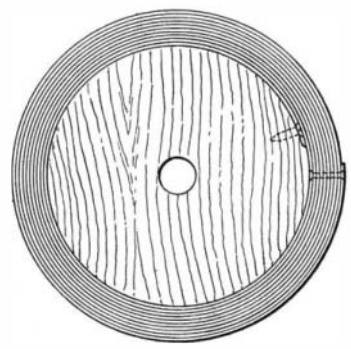


ELECTRIC MOTOR.

Now the shuttle is passed through the ring and brought back over the outside until one layer covers one space; then commencing the winding over the first layer the second is laid on, then the third, fourth, and fifth; all the layers are wound in the same way. The last three or four turns are made over a stout thread, which is tied when the last convolution is made.

The other coils of the armature are made in the same way; and when the winding is all on, the end of one coil is twisted with the beginning of the adjacent coil. A piece of well seasoned hard wood, hard maple, for example, is bored to receive a piece of $\frac{3}{16}$ inch drill rod—Stubs or something equally good—which constitutes the shaft. This rod is 4 inches long. A $\frac{1}{16}$ inch hole is drilled transversely through it at or near the center to receive a short pin which enters a slot in the end of the wooden hub.

This piece of wood is turned to fit the interior of the armature, and it is cut off about the same length as the armature. The coils of the armature and the wooden hub are now varnished with thin shellac varnish, and allowed to dry thoroughly. The armature ring is then slipped into its place on the wooden hub, and the hub and the ring are coated with two coats of shellac varnish, one coat being allowed to dry before applying the other.



THE ARMATURE CORE.

The next thing to claim attention is the commutator. This is a core of wood fitted to the armature shaft and turned to fit a piece of brass or copper tube $\frac{5}{8}$ or ¾ inch in diameter and ¾ inch long. This tube is divided into five divisions, and parallel lines, preferably slightly spiral, are drawn from the divisional points marking the places where the tube is to be sawed to form the commutator bars. But before sawing, each end of each space which is to form a bar is drilled, and the hole is countersunk to receive a small wood screw, which passes into the wood and holds the bar in place when the brass tube is sawed on the lines to separate the bars. After sawing, the commutator is turned smooth and round, or filed in the lathe with a smooth file. The screws used in fastening the commutator bars must not touch each other or the shaft.

The twisted terminals of the coils are now stripped of the winding at the ends and soldered to the commutator bars, having been cut off the proper length to reach to the commutator.

Before soldering, however, the ends of the terminals and a small portion of each commutator bar are tinned to facilitate the work of soldering. To tin the copper wire, a little pulverized rosin is rubbed on the ends of the wires, and the solder is applied with a soldering iron.

The commutator bars are tinned for ⅛ inch at the ends nearest the armature ring in the same manner.

The terminals of the armature coils are bent so as to touch the commutator bars at the tinned surfaces; the beginning of one coil and the end of the adjacent coil being thus brought into contact with a commutator bar. They are then soldered by applying a drop of solder by means of the soldering iron. The wires are thus made to answer the double purpose of conveying the current to the commutator bars and of causing the commutator to revolve with the armature. Acid must not be used in soldering electrical connections.

To run smoothly, the armature must be in balance. To ascertain whether it is in balance, place the armature shaft on the edges of two level straight-edges supported about 4 inches apart. If the armature will stand in any position, it is balanced. If it rolls so that one side after a few oscillations of the armature goes to the bottom, the top must be made heavier to counterbalance the bottom. Probably the best way to add weight to one side of the armature is to apply it in the form of solder to a band of wire about ⅜ inch wide wound around the armature. Before this winding is applied, a strip of mica ⅝ inch wide must be wrapped around the armature and secured in place by shellac varnish applied to both the armature and to the mica and allowed to become nearly dry. It is not necessary to use a

continuous piece of mica; it may be in several pieces. When the armature comes to rest after oscillation, solder should be applied to the upper side of the wire band until the armature will stand in any position. If too much solder is applied, the surplus may be removed by a coarse file. It is important to have the armature as nearly in balance as possible. It will then have very little vibration, or none at all, while running at any reasonable speed.

The description of the field magnet and other parts will be given in an early issue.

Pneumatic Railway Signaling in England.

The London and South-Western Railway, one of the principal railroads in Great Britain, is about to introduce upon its system the pneumatic process of railway signaling, which has been employed with such conspicuous success upon our own railroads for several years. Some time ago Mr. Fay, the superintendent of the line, visited this country, and studied the principles of this system at Buffalo and other large centers, where the congestion of the traffic renders it absolutely imperative that the work of signaling should be rapid, perfect and free from fatigue. In England, at the important termini and busy junctions, the signalman's duty is extremely arduous, the incessant throwing of large, heavy and complicated levers conducing to great fatigue. The simplicity of the pneumatic system was impressed upon Mr. Fay, and when he returned to England he lost no time in recommending its adoption upon his own railway. The first installation will take place at the important junction Basingstoke, and it will be in working order in the course of a few weeks. After the apparatus has proved successful at this station, it will be introduced at the London terminus Waterloo, the largest and busiest station in Great Britain. At the present time several extensions of the railroad are in operation—the road is being doubled throughout the whole route, and Waterloo terminus is to be considerably enlarged—while others are in contemplation. The present is thus an appropriate moment for the introduction of the pneumatic signaling apparatus.

Owing to the stringent regulations of the Board of Trade, by which all arrangements for the safe conveyance of passengers are controlled, such an innovation as this cannot be made without mature consideration. For instance, the distance by which switches and signals may be actuated from a signal cabin is appointed by this department of the state, and should the distance exceed the limit, then an additional signal box has to be constructed.

The introduction of the pneumatic signaling, however, will be far-reaching in its beneficial effects. Under the existing circumstances the signals and points are manipulated by means of wires, rods, and cranks, and where the yards and junctions are busy these constitute veritable death traps.

It is anticipated that the new system will lighten the labors of the signalman, and enable him to concentrate his mind upon his duties. It will be cheaper to maintain, since it cannot get out of order or become damaged like the mechanical apparatus now in use; it is not affected by the weather, and requires no adjustment. Also the numerous brackets for bells and devices for indicating or repeating the signals may be dispensed with. The economical working of the apparatus and its efficacy have been assured upon this side, so that the decision of the English railroad company is by no means to be considered in the light of an experiment. The innovation will be followed closely by the various other railroads in the country, and, if successful, its universal adoption in Great Britain is bound to ensue.

Coal in Japan.

The development of the coal mining industry in Japan is remarkable. A few years ago that country was dependent upon other countries for this article in order to drive industrial machinery, to provide fuel for her merchant marine and her navy. Now this order of things is completely changed. Sufficient coal can be obtained from the native mines to supply the whole country's necessities. The principal coal mining centers are in Hokkaido or northern island and in Kynshu in the south of Japan. Some idea of the present proportions of the industry may be gathered from the fact that the Hokkaido Colliery Company during the first six months of the present year earned a profit equivalent to about $775,000. Of this amount, $160,000 was set aside for the purpose of installing the necessary plant to manufacture coke, since the coal has been found to be excellent for this purpose. But the high price of European coal has caused considerable discontent in mining circles in Japan. At the present time Cardiff coal on the Japanese market is sold at $22 per ton, while the native product fetches only $6 per ton. This state of affairs has been proved to be entirely due to the reckless competition that exists among the small coal merchants; and with a view to surmounting the difficulty, it was decided to form a combination among the colliery owners, and to suspend the sale of coal for two months, so that a consequent rise in price might ensue in the retailing of the coal. It was also decided that the minimum price of the coal be increased to $8 per ton. For a short time, therefore, Japan will suffer from a scarcity of coal, an effect which the colliery owners anticipate will result in a substantial increase in price.

The Current Supplement.

The current SUPPLEMENT, No. 1301, is a particularly interesting number, the first page engravings dealing with the Pavilion of Bosnia-Herzegovina at the Paris Exposition. "High Water Protection Methods on the Lower Mississippi River" is by William Joseph Hardee. "The New Elevators of the Eiffel Tower" are described and illustrated. "Electrical Engineering as a Trade and as a Science" is by Prof. John Perry. "The Population of the United States During the Next Ten Centuries" is by H. S. Pritchett, the new president of the Massachusetts Institute of Technology. "The Late Prof. Max Müller" is the subject of an interesting biography. "Condensed Information Concerning Some of the More Valuable Insecticides" gives many formulas for remedies for insect pests. "Tropical Hurricanes" is by F. J. B. Cordeiro. "The Cradle of the Human Race" is a most fascinating scientific article.

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RECENTLY PATENTED INVENTIONS.

Agricultural Implements.

DISK-CULTIVATOR. — LINDEN KIRLIN, Beattie, Kans. The disk comprises an open rim or ring and a supporting-frame. A body-plate is held detachably in the ring, whereby it may be removed and applied to convert the disk into an open or closed one. By providing this closing mechanism, the disk can be closed in going over the corn the first time, and set to throw the dirt away from the corn. The disk is solid, so that it will move all dirt away from the corn; but the second and third time, the dirt is thrown toward the corn with the disk half-open.

COMBINED HOE AND WEEDER. — GLENN A. MORRELL, Grand Rapids, Mich. This implement comprises sides; a back; a cutter-blade at the front; and spaced wires stretched from the blade to the back to form a perforate bottom. As the scoop, thus constituted, is pushed forward, the weeds are cut by the blade and fall into the scoop, the dirt dropping through the perforated bottom.

Engineering Improvements.

INSTANTANEOUS STEAM-GENERATOR. — CHARLES L. PALMER, Albany, N. Y. Within each generator-tube is located a solid rod of a somewbat smaller diameter than the bore of the tube. In the annular chamber thus formed is located a spirally-disposed wire or rib, continuous or interrupted. The spiral rib lengthens the path of the water and thus secures a more energetic vaporization. The interior core or rod, being solid, has a large heat-retaining capacity.

Mining Apparatus.

CONCENTRATING-TABLE. — IRA F. MONELL. Boulder, Colo. The concentrating-table is mounted to have lateral motion and is provided with a series of diagonally-arranged channels. Pins extend upwardly from the table above each set of channels; and fixed riffles are arranged at one side of the series of chambers. The heavier particles will tend to move toward one side of the table; and the very light material, with the water, will pass over the tailpiece into the fine channels or grooves of the table; and from these fine channels, the material is deposited into larger, deeper grooves. Some of the material and sand, however, will pass to the upper sides of the riffles and form sand cushions through which the excess of water will pass and discharge over the tailpiece.

Mechanical Devices.

WATER-SUPPLY REGULATOR.—FREDERICK S. SEYMOUR, Dubuque, Iowa. The purpose of the invention is to provide means for controlling the supply of water to a tank or other receptacle. The apparatus has cut-off devices in connection with water forcing or supply apparatus. In the construction a pan is included in which the water backs from the trough when full, so that when the pan drops by the weight of the water, the cut-off devices will be operated.

CONTROLLABLE BALLOON.—LEO STEVENS, Manhattan, New York city. From the cigar-shaped gas-bag of the balloon a rigid beam is suspended. The flexible connections between the two sustain a parachute. From the beam a car is supported carrying motors for the purpose of driving propellers. Rudders are provided to steer the balloon. A slidable weight on the beam enables the aeronaut to direct the air-ship up or down.

SNOW-MELTER.—JACOB MANDREY, Bronx, Manhattan, New York city. The snow-melter comprises a frame mounted on wheels, with a furnace arranged to swing in the frame and provided with a downwardly-inclined forward portion through which the products of combustion pass. Sprocket-chains at opposite sides of the furnace are provided with scrapers which serve the purpose of carrying the snow to the furnace as the machine is moved forward. The sprocket-chains are driven from the rear wheels.

COMBINATION-LOCK.—WILLIAM E. H. MORSE and OLIVER H. BEMIS, Algona, Iowa. The invention provides a new and improved combination door-lock and knob arranged to work the door-lock by the use of the outside knob, which latter is adapted to be set to any desired combination to prevent unauthorized persons from opening the door and to allow the owner readily to unlock and open the door without the use of a key.

CLIPPER.—ALLAN QUARRIE, Oak Lake, Manitoba, Canada. The purpose of the invention is to provide a clipper especially adapted for removing or clipping hair from animals. The cutter-plate is operated by the handles, when placed in any one of three positions. One of these positions is that known as "straight" or at right angles to the cutting-face of the machine. The second position is at the right-hand side of the cutting-face. The third position is at the left-hand side of the cutting-face. The machine can therefore be used on all portions of an animal's body and limbs.

REGISTERING-DEVICE FOR POOL GAMES.—WILLIAM TABER, Poughkeepsie, N. Y. Each time the triangle is removed from its rack or support, a game will be registered by suitable mechanism carried by the rack or support. The rack or support is also provided with means for registering a series of games. A mechanism is also furnished, through the medium of which the number of players in a game can be indicated and the record of each made upon a concealed tape. The merits of the invention are obvious.

FABRIC-STRENGTH-TESTING DEVICE. — WILLIAM M. VERMILYE, New Brighton, Richmond, New York city. The machine consists of a frame in which two sets of jaws are mounted for clamping the fabric. The one set of jaws is shifted outward or inward by screw-actuated rods moving in the frame; and the other set of jaws is connected with a coiled spring and with a rack engaging a pinion upon the shaft of which the index finger of a scale is mounted. The fabric is clamped in place; the jaws separated from one another; and the breaking strain is registered on the scale. A magnifying glass is provided for examining the stretched fabric. The device may be made small enough to be carried in a pocket.

Railway Appliances.

SWITCH-CONTROLLING DEVICE FOR SURFACE CARS.—CHARLES G. BAUER, New Rochelle, N. Y. The device is carried by the car and is designed, when operated, to throw a switch from the car. Such arrangements have been already invented; but the present device differs from most of them in so far as it is automatically released after the switch has been set. Other features of interest and merit are the simplicity of construction and ease of operation.

MAIL-CATCHER.—CHARLES C. COLEMAN, Keytesville, Mo. By means of this novel device a mail-sack at a station can be transferred from a holding device to a moving mail-car or from the moving car to the holding device, or for simultaneously transferring from one device to the other. The catchers on both car and station consist of bifurcated arms and rings from which the mail-bags are suspended. The arms catch their respective rings and the mail-bags are transferred.

VENTILATING ATTACHMENT FOR RAILWAY-TUNNELS.—JAMES J. SWAINE, 1918 Mt. Royal Terrace, Baltimore, Md. To remove smoke and cinders from tunnels, a supplemental arch or roof is provided, which is arranged longitudinally and transversely a short distance below the true arch or roof. This supplemental arch has a lengthwise opening in its highest part, through which smoke and cinders are discharged by the locomotive-stack. The gases are condensed, concentrated, and removed.

Vehicles and Their Accessories.

AUTOMATIC TIRE-INFLATING DEVICE.—THOMAS H. MCCAULEY, Port Arthur, Ontario, Canada. The tire is provided with a bulb coacting with an air-inlet having a check-valve. When the rotating tire receives the load strain, it will be somewhat flattened at the point of its contact with the ground. In this position the bulb will be compressed, the check-valve closed, and air will be pumped into the tire.

DRIVING MECHANISM FOR MOTOR-CYCLES OR MOTOR-CARS.—PROSPER A. RENAUX, Rue du Repos 33, Paris, France. The motor is made to operate the driving-axle by means of a special arrangement which takes the place of a differential gear for the motor-axle. This special arrangement consists of two shafts with a fly-wheel loosely mounted on each. A sleeve connects the fly-wheels; and in the sleeve a pinion is contained. On each of the shafts a pinion is rigidly mounted, one of these pinions engaging the pinion in the sleeve directly. A loose pinion engages the pinion on the other shaft and the pinion in the sleeve.

WHIFFLETREE. — ALBERT NELSON, Idaho Falls, Idaho. The invention relates to a class of whiffletrees provided with attachments adapted to release the traces or tugs when traction is applied. The whiffletree has tug-clips at its ends with spring-bolts carried in the clips and provided with pulleys journaled on their inner ends. A cord passes over the pulleys, and is secured at its ends to the whiffletree at points intermediate of the bolts and pulleys. A pull-cord is attached to the cord and is connected to the bolts. The effect of the tractive force applied to the cord is practically double that produced when the ends of the cord are attached directly to the bolts.

Miscellaneous Inventions.

CARBURETER.—HENRY BURTON, Russellville, Ind. This gas-machine comprises a coil through which gasoline or the like flows. Below the coil is a burner for vaporizing the gasoline. The coil is connected with an expansion-chamber. Above the expansion-chamber is a casing provided with an injector-pipe. A valved air-supply pipe extends laterally from the casing. A gasometer receives the gas. Levers operate the valves from the gasometer-bell. As long as there is any gas in the gasometer, it will be necessary merely to light the burner in order to start the machine.

SLUICE-GATE.—AUGUSTUS PRESCOTT, Salem, Ore., and LEWIS I. FURBER, Winlock, Wash. The gate is particularly adapted for small streams where the natural flow of water is not sufficient to make the stream serviceable for logging without first building a separate dam to hold enough water. In this sluice-gate, casings are employed, terminating in forebays at the downstream end. Water-inlet sluices lead through the casings and into the forebays. Valves are provided for the sluices. Outlet-sluices lead from the forebays and are likewise provided with valves. Gates are pivoted at the downstream ends of the casings. Wings extend from the gates and operate in the forebays, the wings having a greater area than the gates. By reason of this greater area, the pressure of water flowing into the forebays will act to move the gates to a closed position against the water resistance.

Designs.

TOWEL-HOLDER. — LOUIS MCCUTCHON, Havana, Cuba. This towel-holder is a clamp made in the shape of a bottle and is designed to be used in barber-shops.

HEADPIECE FOR GRAVES. — EMIL BICK, 521 Seventh Street, Buffalo, N. Y. The head-piece is in the form of a Greek cross. Its foot is pointed, so that it may be forced into the earth, and radial arms are provided to rest on the surface and thus assist in supporting the head-piece upright. Sockets for flower-pots are formed in the top of the central part and also in each of the horizontal arms. A chamber, closed by an ornamental panel, is arranged in the vertical part.

TOBACCO-MOISTENER. — SIGISMUND STRAUSS, Manhattan, New York city. The design provides a moistener comprising a triangularly-shaped receptacle, the front of which is transversely curved and longitudinally tapering. The front is apertured.

BRAID.—LOUIS BRANDT, Manhattan, New York city. From a central loop section body-loops extend at each side, inclining in opposite directions from the side, but in direction of the same end of the central section. The body-loops are so arranged with reference to one another and with reference to the central section that they present in plan view a series of interlocking bow-ties.

HOOK. — FRANK KEMETHER, Glasgow, Del. A straight shank terminates at one end in an open hook and at the other end in a straight arm bent at right angles to the shank.

VERNIER-PLATE FOR SURVEYING INSTRUMENTS.—GEORGE L. BUFF. Boston, Mass. The inventor protects the ends of the level by arms rising from the plate.

SLIPPER ORNAMENT.—JOSEPH A. DALRYMPLE, Haverhill, Mass. The design consists of an ornamental casting simulating beads.

NOTE.—Copies of any of these patents can be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.