song is the time when they composed a song in praise of a missionary lady working among them, on her departure for England on furlough.

When a Toda dies, several buffaloes are slain to accompany him to the other world, and his arm is placed around the horns of one of the slain buffaloes.

They have green funerals and dry ones. The green funeral consists of the burning of the body with its attendant sacrifice of buffaloes and other ceremonies. The ashes are left to the winds.

The dry funeral is one that takes place at the beginning of each year in memory of all who have died the previous year. They gather together in great numbers and slaughter a number of buffaloes and perform many ceremonies. The flesh of the slain buffaloes is given to the Kotas, who furnish the music. The names of the dead are never mentioned again. They think that a string bridge leads to heaven and that hell is a swamp full of leeches. They have no idols, except as they may have borrowed one or two from the Hindoos. Their worship is that of the elements and ancestors and has a pastoral coloring that indicates a Vedic origin. They have no written language, but their lady missionary has introduced the Tamil character to provide books for them.

They number 750. No one has ever been baptized as a Christian. One became a candidate and had prepared himself to arrange his matrimonial affairs in accordance with Christian requirements, but when it came to the loss of his share in the buffaloes of his family, he could not endure that and went back to his heathen life.

The Todas receive tributes of grain from the Kotas and Badagas. If a Badaga refuses tribute, all they do is to prepare to occupy a "mund" near the Badagas' fields. The Badaga would pay much rather than have a herd of buffaloes overrunning his crops, so the tribute is soon forthcoming.

The buffaloes are in a semi-wild state, and have been known to chase cyclists on the roads.

Three of the illustrations show respectively a Toda hut, a Toda man, and a group of Toda women with their embroidery over their knees.

They do not seem to be decreasing, but rather are on the increase. But their constant cry for "elam" (alms) indicates a degeneration of character resulting from the curiosity they excite among all foreigners.

Madura, South India. J. S. CHANDLER.

Home-made Koumiss.

Koumiss is usually prepared by causing cow's milk to ferment by addition of yeast. A far better result is obtained, however, if mare's milk is employed, for this is used by the nomadic tribes of South Russia, who consume koumiss almost exclusively during the summer. The better product is caused by the fact that mare's milk is poorer in caseine and fat than cow's milk and hence much more digestible than the latter. To use cow's milk with advantage for the production of this refreshing beverage, it is well to lessen the percentage of caseine by dilution with water and then to produce a mixture resembling mare's milk by adding sugar. For the preparation of koumiss, it is best to dissolve milk sugar in water and to add the solution in the proportion stated below. Next, rub up pressed yeast with brown sugar with a little of this liquid to a pasty consistency and add this paste to the milk mixture. The liquid obtained is now left to ferment in well closed champagne bottles, the pressing in of the cork being conducted with care, since the quality of the resulting drink is particularly dependent upon the closure. The filled bottles are kept at a moderate temperature for several days for fermentation purposes, shaking them daily for about ten minutes to prevent the caseine from settling. Great care must be exercised in agitating the bottles, since a high pressure is occasioned by the gas generated in the fermentation, and the bottles, not carefully selected for this purpose, are apt to crack, thus causing injuries. Therefore, it is advisable to wrap up the bottles in a cloth while shaking. After a few days the bottle contains a beverage which is valuable as a readily digestible food, especially in the case of stomach troubles, but also as an excellent refreshment for healthy people. For one champagne bottle with one-third water-diluted milk use two teaspoonfuls of white sugar dissolved in a little water, and a little yeast; let the fermentation proceed at about 20° R. (77° F.)—Technische Berichte.

Turkey Orders Warships.

The Turkish government has just placed an order for six cruisers at the German shipbuilding yards at Kiel, and a contract for two torpedo boats, which are nearly completed, has been given to the Ansaldo shipbuilding yard at Genoa.

The Current Supplement.

The current SUPPLEMENT, No. 1291, is of remarkable interest. The first page engraving is devoted to the "Fish River Caves near Sydney, Australia," and is elaborately illustrated. "Inaugural Address," of Sir William Turner, President of the British Association for the Advancement of Science, is commenced in this issue. The third installment of "Mechanical Stoking" is also printed in this number. "The Chinese Army" is a timely article, as is also one on the "Exhibits in the Metallurgical Section of the Paris Exposition." "American Engineering Competition—XI." deals with machine tools. "A New Railway Test Car" is fully illustrated. "Chemical and Technical Education in the United States" is a most interesting and valuable paper, and the first installment is given in this issue.

Contents.

(Illustrated articles are marked with an asterisk.)

RECENTLY PATENTED INVENTIONS.

Electrical Apparatus.

CONDUCTOR AND COLLECTOR FOR ELECTRIC RAILWAYS.—ARTHUR PETZENBÜRGER, Berlin, Germany. A high electromotive force is not allowed by city authorities in the case of overhead or rail conductors because of the danger incurred. It is the object of this new construction to overcome the obstacles presented by this rule. A conductor-casing is used having an elastic strip on each side of its slot, one strip being secured to the casing by springs and the other to the casing by a hinge. The elastic strip undergoes only a slight lateral movement on the collector-arm passing, whereas the second hinged strip is turned back when the collector-arm passes through, being closed afterward by its own weight.

Engineering Improvements.

VALVE GEAR FOR LOCOMOTIVE-ENGINES.—GEORGE B. EDDY, Camden, N. J. The admission and exhaust valves have independent motion, the stroke of the exhaust-valve being fixed and that of the admission-valve variable. A link-motion is actuated by an eccentric mechanism to control the admission-valve. The exhaust-valve is operated from the eccentric mechanism to impart a full stroke to the exhaust-valve irrespective of the position of the eccentric mechanism. As the exhaust-valve has a full throw at all times no back pressure is liable to occur in the cylinder; while the steam is free to expand in the cylinder, as the exhaust does not take place until the piston nears the end of its stroke.

GAS-ENGINE.—WILLIAM E. CARY, Springfield, Vt. This engine is provided with a valve-chamber and a supply-pipe. The admission of the explosive mixture from the supply-pipe to the valve-chamber is controlled by a rotary valve. In the supply-pipe is a throttle-valve on the stem of which a spring-pressed arm is held by one end, the other end being free. This arm can be adjusted along the throttle-valve stem. The governor used comprises two disks on the rotary valve-stem, one of the disks being fixed on the stem and the other mounted to slide on and turn with the stem. Weight-carrying springs connect the disks. On the slidable disk is a cam which is normally out of engagement with the arm on the throttle-valve stem, but which swings the arm when the slidable disk moves toward the other disk. The engine can be started without any adjustment of the valves and stopped simply by switching off the current to the electrodes.

Mechanical Devices.

CHURN.—CHARLES E. YATES, Near Mill Grove, Mo. This operating mechanism for churns consists of a stationary guide on which a cross-head moves, provided with projections adapted to be connected with the dasher-rod and with a loop extending transversely to the guide. A pitman is connected with the cross-head and extends through the loop. Crank mechanism is connected with the pitman. The device enables the dasher to be operated uniformly with small expenditure of power—and therein lies its chief merit.

PITMAN CONNECTION. — DAVID C. LINGENFELTER, Plainview, Neb. The bearings of pitmen of mowing-machines are subjected to much friction and soon become worn so much that the parts must be readjusted to prevent lost motion. The present invention is designed to overcome the difficulty. Keys of graduated widths are used which are successively inserted as the wear increases. In every case the key not only prevents the adjacent edges of the bushing from being brought too near together, so that the bushing cannot be clamped too tightly upon the wrist-pin, but also forms a continuation of the smooth friction-surface required for the interior of the bushing, thereby performing two functions simultaneously.

SAW-SHARPENING MACHINE. — GRANVILLE BARTLETT, Station C, Detroit, Mich. The machine is of that form in which the saw is held in a clamp, and the filing-bar, with file, is reciprocated in guides across the edge of the saw. In the present case a clamp is employed, composed of three separate parts having two spaces for receiving and clamping the saw in different planes. Bolts pass through the three parts of the clamp, and a movable file-carriage with guides receives a reciprocating file-bar. Not only is a full movement secured for the file, but there is no obstruction to a full view of the saw-teeth.

Vehicles and Their Accessories.

VEHICLE AIR-BRAKE.—WILLIAM J. DONALDSON, JR., Avenue Hotel, Galveston, Tex. The inventor has devised an air-brake which is especially adapted to bicycles, tricycles, and similar vehicles. The merits are a great ease of application; a powerful application of the brake; a quick release; and an accurate regulation of the force of the brake. The device can be applied to any ordinary bicycle, without marring the appearance of the wheel.

AUTOMOBILE. — WILLIAM O. BARNES, Stamford, Conn. Mr. Barnes has devised an automobile in which the propelling power is distributed from the motor to the four wheels, or to the rear wheels, or to the two front wheels, a gear being provided by means of which the vehicle can be readily and easily steered, when the front wheels are used as driving-wheels. The running-gear is so constructed that the driving-wheels, front and rear, are spread apart from the ground upward. One of the novel features of the invention is the use of a tubular stub-axle carrying a drive-shaft, and provided with an inclined hinge, the axis of which intersects the ground in the plane of the wheel. The inclination of the hinge is such that the weight of the wagon will create a tendency to straight running.

Optical Instruments.

PHOTOGRAPHIC CAMERA. — JACOB SCHAUB, Logan, Utah. The invention relates to improvements especially applicable to cameras of the multiplying type, whereby the size of the field covered by the camera in changing from one exposure to the next is equal only to the size of the sensitive plate. The camera has simple and efficient means for projecting the sensitive-plate support or frame away from the carriage in which it is mounted and for reciprocating the carriage laterally on the base of the camera. An improved device is provided for confining the light-rays to the size of the "cut-out" or mask. A glass frame is so arranged that the operation of inserting and removing the plate-holders or ground glass will not jar the camera.

LENS.—ROBERT D. GRAY, Manhattan, New York city. Each element of a photographic objective consists usually of a convex lens of crown glass and a concave lens of flint glass of higher refractive index. In order to overcome the spherical and oblique aberration which increases in this combination with an increase of effective aperture, Mr. Gray constructs each element with a convex lens of higher refractive index than that of the concave lens. Besides reducing the spherical aberration, the combination relatively lengthens the focus of those rays which pass through the latitudinal section of the lenses, thereby reducing astigmatism to a minimum.

Miscellaneous Inventions.

FISHING-FLOAT.—LORENZO P. GIBSON, Little Rock, Ark. This float effectively maintains an upright position in the water without dependence upon the tug of the line at the lower end of the float, by which arrangement the lower portion of the line can be left entirely free, without a sinker of any sort, if such arrangement be desired, and yet maintain the float in vertical position.

INHALER.—PETER T. DONOVAN, Manhattan, New York city. The inhaler consists of a wire-body having spring-clamps at its upper portion adapted for engagement with opposite sides of the cartilage of the nostrils. Receptacles supported at each side of the body below the clamps are designed to contain an absorbent material for healing agents. The inhaler is to be used for the treatment of catarrh, asthma, bronchitis, and like ailments, and is to be worn particularly at night.

BED-COUCH. — JOHN THOMPSON, Brooklyn, New York city. The subject of this patent is a combined couch and bed which can be quickly and easily changed from a couch to a bed of a desired width and is readily changed from bed to couch form. The couch comprises end frames on which side extensions are mounted to swing. When it is desired to convert the couch into a bed, one or both of the side extensions are raised, depending upon the width desired for the bed.

PROCESS OF CURING AND SMOKING FISH.—HORACE E. KIRBY, Rock Bay, British Columbia, Canada. The fish after being carefully cleaned and sliced into cutlets, cured with sugar (without the addition of water), and thoroughly washed and allowed to drain, are hung on nails driven into long sticks; and these sticks are hung up in the smoke-house, which is an ordinary building made of rough timber and tightly battened up. The process is said to be cheaper than any which has been heretofore used.

SHOE-STRETCHER.—CHARLES W. CROZIER, Manhattan, New York city. By means of this stretcher a shoe can be simultaneously stretched at the sides, toe, and instep, or the toe and instep can be stretched without stretching the sides.

DRAFT-DEVICE. — JOHN COMMISKY, Manhattan, New York city. A series of hoods of special form are arranged to form a complete circle around the stack, partitions dividing each hood longitudinally into two compartments communicating at the top. Draft-pipes in the stack communicate with the interior of the hoods. The top and bottom plates of the hoods are curved to reduce the frictional resistance to the wind passage. By means of the partitions, the wind is caught in each hood in whatever direction the wind may blow.

DRAWER-EQUALIZER. — WILLIAM BEEBE. The purpose of this invention is to provide means for equalizing the movement of drawers in furniture for the sake of securing uniform movement and preventing binding. The under surface of each drawer is provided with racks which mesh with pinions connected by a common shaft. The racks can be formed in any desired length and subsequently cut off to suit the size of the drawer.

PRINTING-PRESS ATTACHMENT.—MAX SNYDER, Beatty, Penn. The inventor has devised a frame for placing the forms in position on upright or job-printing presses. Heretofore the task has been one of considerable difficulty. The present invention enables the form first to be placed on the platen and held there by hand. Then by driving the press sufficiently the form can be engaged directly with the form-holder to be held thereby.

CEMENT-CURB MOLD.—CHRISTOPHER H. WATSON, Riverside, Cal. In forming cement or concrete-curbs, it is customary to form a mold of the exact size of the curb desired and then to tamp this with the concrete or cement mixture and leave the mold in place until the mixture has hardened sufficiently to retain its shape. The mold is then removed and taken to another point in the curb, where it is again used. These cement-curbs are usually formed in place, for which reason it is desirable to have a device which can be readily moved and adjusted to different curves. For this purpose the inventor employs an arrangement comprising a framework or yokes, with retaining-plates mounted thereon to slide toward and from each other. The plates are operated by cams journaled upon the yokes.

PRINTING-STAMP.—JOHN W. ADAMS, Pinebluff, N. C. The invention provides a printing-stamp with rubber type, having a great number of printing data assembled in compact form and so arranged that any line of printing matter can be quickly brought into position to make an impression, thus obviating the employment of a number of stamps on independent holders and in racks. The device is particularly useful in banks, offices, and the like, where the saving of time is to be taken into consideration.

SKATE.—HUGO HANDWERK, Brooklyn, New York city. This skate has four independent runners arranged in connected pairs—two at the heel and two at the toe. Each pair of runners has more or less elastic connection with the body portion of the skate; and each runner may be conveniently removed at any time and replaced. The construction gives the skater better purchase on the ice, particularly in long-distance skating.

BED-PAN.—HARRIET D. GOODRICH, Augusta, Ga. The purpose of the invention is to do away with the unpleasantness and discomfort of the patient's lying on the back in contact with so much cold surface. The device is constructed with due regard to sanitary principles.

Designs.

BADGE.—CARL F. KABISCH Manhattan, New York city. The leading feature of the design consists of a shell within which is a pebble. A beach scene is painted on the shell.

HEEL FOR BOOTS OR SHOES.—JOSEPH PETRONE, Manhattan, New York city. The heel is vertically fluted or channeled to add to the appearance of the shoe.

BINDER-TAB.—FRANK TAFT, Brooklyn, New York city. The binder-tab is a simple, ingenious device for securely binding together all kinds of sheets.

LINK CUFF-HOLDER. — GEORGE KALKBRENNER, Manhattan, New York city. The holder is designed securely to connect the cuff with the cuff-button, a hook being provided to engage a button-hole of the cuff and a loop to engage the button.

NOZZLE.—WILLIAM H. DEWAR, Manhattan, New York city. The designer has provided a simple device for use on public drinking-fountains, to prevent infection from contagious diseases, by doing away with the uncleanly cups generally used. A stream of water is caused to flow into the mouth from a nozzle, a guard being provided to prevent the mouth from coming in contact with the nozzle.

GAME-BOARD.—EDMUND F. HAWKINS, Yaphank, N. Y. The game is played by shooting a ball through one of a number of arches so that, if possible, it shall strike one of a number of posts or a bell suspended in the line of the longitudinal axis of the board.

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.