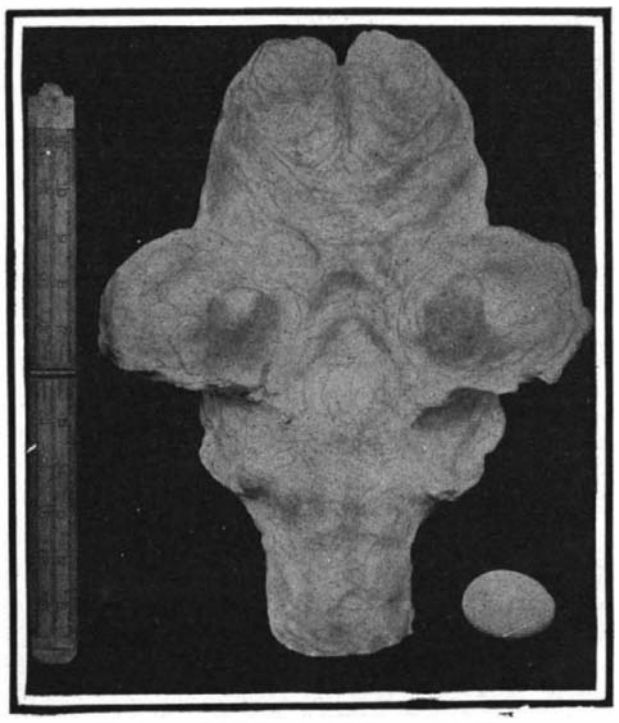
completely taken apart and all the bones given an alcoholic immersion, to remove the dark coating that had covered them, so that now they have the original bright red color, just as fresh and perfectly preserved as when first dug up.

The placing in position for experimental purposes to determine the proper poise, etc., of some of the enormous bones, such as the massive six-foot pelvis, fore and hind limbs, weighing from 100 to 500 pounds, was a delicate mechanical task, requiring a high, derrick-like structure, equipped with strong iron chains and pulleys for lifting and sustaining the weighty masses. A view of the mastodon encircled in this network of scaffolding is shown in one of the accompanying photographs. The mounting of the frame in a life-like, walking attitude was a difficult engineering task, which has been most skillfully accomplished by Mr. Adam Herman, chief preparator, and his assistants, Messrs. Lang and Schlosser, under the direction of Prof. Osborn.

Here is a summary of the discovery near Newburg, N. Y.: Ulster and Orange Counties in this State, and the valley west of the Catskills and parallel with the Hudson, for some reason seem to have been a favorite haunt and habitation center of the mastodon. The physical conditions of this section of the country at this Post-Glacial Period, owing to the receding ice sheet, which had left numerous small pools affording a convenient source of water supply, and, moreover, an abundant feeding ground, were thought to have been especially favorable to their existence. This lucky and historic find was come upon by mere chance, in August, 1845, as follows: A Mr. Brewster, a farmer near Newburg, was desirous of obtaining some fertilizing material for his fields. In one of his bottom tracts there had been a small pool of water, about 40 feet in diameter, in the midst of wet, swampy surroundings. This spot, owing to an unusual summer drought, had been left dry, so the farmer determined to use its contents for his desired purpose. Consequently, he set a number of laborers to work with spade and shovel. After digging three or four feet the workmen came to a bed of shell-marl, and the spade struck a hard substance, which was thought at first to be a stone or log. On further excavating, however, it was discovered that it was a portion of a fossil remains, and the spade had first struck the top of the head. On the second day the buried object was excavated, and revealed the remains of a gigantic mastodon. The whole of the skeleton was intact, with all the bones extraordinarily preserved and in place, just as the animal had sunk helplessly in the mire several thousand years before. The position of the limbs indicated that the great beast was making a brave struggle and attempt to extricate his weighty body from the pitfall in which he had been mired. Inside of the ribs was found what was the last meal of the mastodon, a mass of from four to six bushels of twigs and branches, one and one-half inches long, leaves, some sort of vegetable substance, half masticated. The skeleton was temporarily stored in the farmer's barn, and shortly afterward the news of the discovery was spread over the country, and attracted the attention of Dr. John C. Warren, a distinguished professor of anatomy in Harvard University at that time, who, recognizing the immense value and

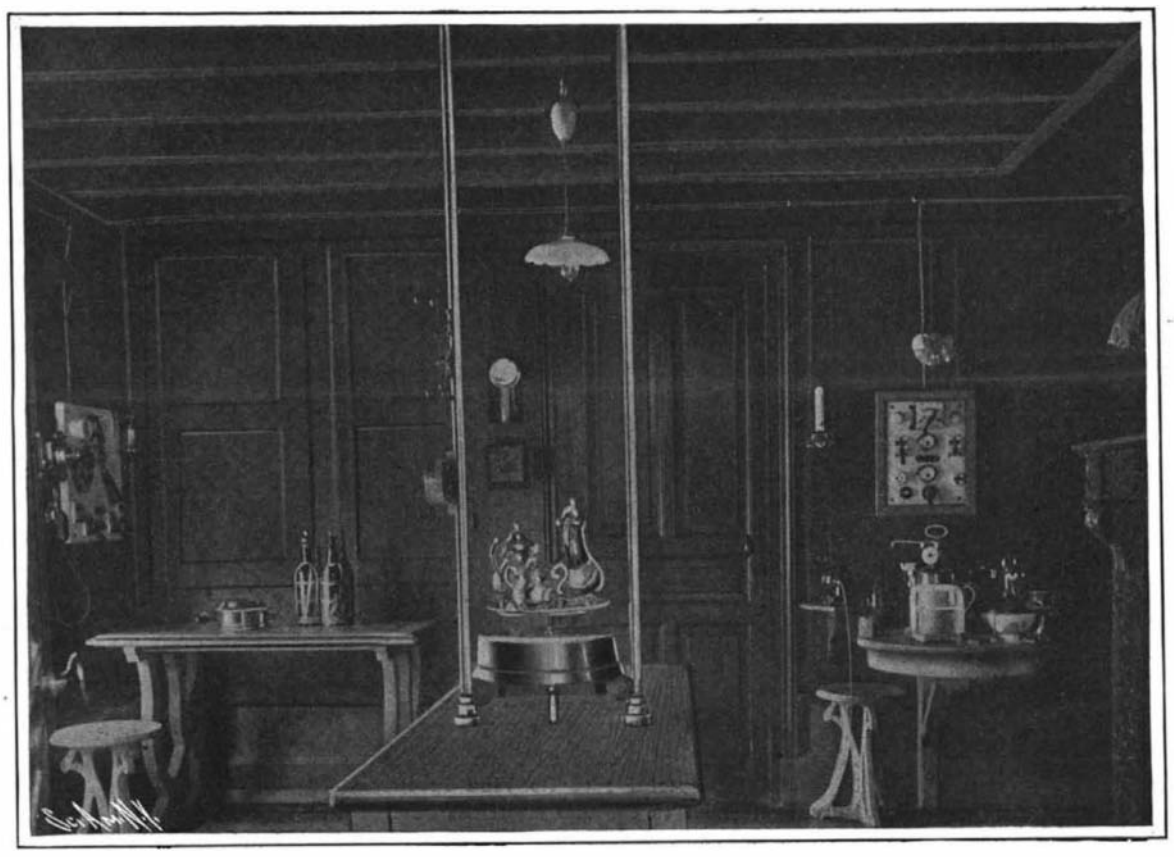


THE HUGE BRAIN OF THE MASTODON.
For comparison of size a 1 foot rule and a hen's egg are also shown.

importance of the mighty frame as being one of the rare extinct marvels of the past, bought the skeleton. A year afterward he had it mounted, and Sir Charles Lyell and Prof. Louis Agassiz were among some of the first noted scientists to inspect the skeleton by invitation of Dr. Warren. In 1849 it was placed in a little fireproof structure or museum in Boston. Under this exclusive roof it remained practically hidden and buried from the outside world, as only one day or so in the year were visitors allowed access to this private museum. Here it remained until 1906, when for $30,000 this and several other specimens composing the "Warren Collection" were acquired by Mr. Morgan. One of the noteworthy features of unusual scientific interest which Prof. Osborn has brought to light is the size and shape of the animal's brain. By cutting into a section of the skull and opening the brain cavity, it was found possible to obtain a plaster cast of the mastodon's enormous brain. The cast was made by Mr. Otto Falkenbach of the laboratory staff. The giant undoubtedly possessed considerable cunning, keen instinct, and a high order of brute intelligence. The huge 60-foot and 70-foot Dinosaurs like Diplodocus and Brotosaurus, in comparison had incredibly small brains, even less than the size of a tea-cup. The surprising size of the brain which guided this mighty beast is strikingly set forth in comparison with the hen's egg and the one-foot rule, seen in the accompanying photograph. The brain cast is 13½ inches long, 12 inches wide, and 7 inches thick. In life it probably weighed 12 or 15 pounds, and would likely have filled the greater part of a water bucket.

The mastodon is regarded as a species of fossil elephant, but it differs from the true elephant in the structure of the teeth, which resemble those of a more typical mammal, such as the pig, for instance, and also in having a longer head. A striking view of the elongated lower jaws, showing the number and shape of the teeth mechanism of the mastodon, is clearly brought out in one of the illustrations.

The mastodons flourished in the latter stage of the world's geological history, and their remains in this country are found in the uppermost layers and deposits of the Pleistocene Age. They lived almost in historic times, only a few thousand years ago. The extinction of the race of mastodons, which were of such enormous size and great strength, and able to endure extremes of heat and cold, is thought not to have been due to climatic conditions alone, but to some mysterious and unknown cause. Prof. Osborn suggests that an insect pest may have caused their disappearance from the face of the earth, as such pests to-day are deadly exterminators of mammals in certain parts of Africa. The probable life appearance of the mastodon is realistically portrayed in the accompanying drawing by Mr. Charles R. Knight. The tusks, however, have been determined to have curved inward instead of outward, since the composition was made.



KITCHEN, SHOWING ELECTRIC ELEVATOR BY WHICH THE DISHES ARE CARRIED TO THE DINING ROOM ABOVE.

ELECTRIC DINING TABLE, SHOWING WINE COOLER MAKING ITS ROUND.

AN ELECTRIC DINING TABLE.

A gentleman named Knapp has constructed, and occupies, in Troyes, France, a house which he calls the Villa Feria Electrica, or electric fairy palace, for the reason that servants are almost entirely superseded by electrical machinery. Table service, for example, is accomplished by the following devices:

An electric elevator transports the dishes from the kitchen to the dining room directly above. The dining table is in two parts: a small central table for flowers, fruits, and ornamental pieces and an elliptical annular coun-

ter around which the guests are seated. The interval between the two parts is occupied by a moving band of metal. As each dish arrives from the kitchen it is deposited on a carrier attached to this band. Then the carrier, controlled by keys manipulated by the host, travels around the table, stopping before each guest, turning, if necessary, to present the handle of the soup ladle or the most advantageous point of attack, going back to serve a belated or hesitating guest, making another round, and mutely pleading for the acceptance of a second portion, returning the dish to the elevator, collecting plates and other utensils with some slight assistance by the guests, and proceeding to the service of the next course—all with nearly human and more than butlerian intelligence. The current is furnished by 28-volt accumulators, so that the specter of electrocution is banished from the feast.

Paper Textiles: The New German Material for Yarns and Cloth.

Such extensive interest has been taken in the results of the investigations made at the instance of the Bureau of Manufactures about paper yarn for use in textile industries, that the following particulars, gathered by Consul Carl Bailey Hurst, of Plauen, subsequent to forwarding his report on "Cloth from Paper,"* will prove of further value:

While the term "paper yarn" popularly expresses the new material, the name "wood yarn" is preferable. The yarn proper is cellulose fiber converted into flat strips of the thickness and width required for the making of a particular weight of thread. These narrow strips are spun on especially constructed machines, sometimes alone, or when extra strength is required, round a minute cotton thread, which comprises from two to five per cent, in the strongest yarn, of the material used in xylolin, the variety of paper yarn made in Saxony.

It is not sought to obtain elasticity in the paper yarn; strength and flexibility are the objects in view. Yarn by this new process can be produced from wood fiber far cheaper than from shoddy or the waste of cotton mills; which materials, limited in quantity and irregular in supply, unadapted to the finer shades in dyeing, are more expensive and also inferior to cellulose for the purposes to which xylolin is put. A fabric of good paper yarn may be laundered again and again. An instance may be cited of a piece of white drugget, intentionally placed before a door of a busy office, tramped on incessantly for two years, that has been washed some fifty times, and comes out white and strong, so that its life of usefulness is by no means at an end.

Efforts have been made heretofore to weave common paper twine, but every endeavor has been futile, as it is unsuited for the purpose.

Several patents have been taken out in the United States to turn paper into yarn, and one mill makes its paper yarn under an American improvement, the patent rights to which have long since expired. Paper yarns have been experimented with for over a generation. The German products, from the specimens that have come under my observation, possess perfect uniformity as to thickness and they have no relation whatever to parcel twine.

The question of cost is of first consideration. So far as ascertainable from the Saxon mills, the labor in producing 1 kilogramme (2.2 pounds) of wood yarn is 3 pfennigs (four pfennigs about equal one cent); while in Bohemia it is slightly less. The paper yarn itself is sold wholesale at 80 pfennigs or 19 cents a kilogramme, whereas the cheapest cotton yarn available for the textile industries in the same neighborhood is 2.4 marks or 57 cents a kilogramme—just three times the price. A spinning machine for producing medium numbers of xylolin has from 72 to 100 spindles; 2,000 spindles can produce 6,000 kilogrammes (6 long tons) of the wood yarn in one day. For about 2,000 marks ($476) a machine up to 120 spindles can be built for the spinning of xylolin.

As this yarn can be woven into almost any fabric, such as dress materials, tents, bathing suits, imitation Panama hats, carpets, and grain bags, one manufacturing plant can not well produce all the articles for which paper yarn may be employed. While the industry has well passed the experimental stage, it is nevertheless of such recent development that the paper or wood cloths are not generally found in the retail stores, or at least advertised as such. There are now two mills in Germany producing together 10,000 kilogrammes (10 long tons) of xylolin daily. One large manufacturer, it is stated on credible authority, after obtaining unequivocal results from the new yarn, placed an order for 300,000 kilogrammes (300 long tons) for his carpet mills.

One of the most important jute spinning and weaving firms in Europe has contracted for the privilege of making combination bagging of paper yarn and jute, an article that has proved to be a great success, not only on account of the cheapness compared with bagging of jute, but incidentally having the quality of being odorless; bagging of paper yarn alone can be more advantageously used for sugar, coffee, salt, and other products susceptible to pungent odors. Tapestries, not printed, but woven in colors, as well as toweling of xylolin are alike turned out in great quantities. Not only can the yarn be used in coarser fabrics, but it has also been tried successfully in hand-made cushion laces. There is a desire to take it up in a measure in the machine-made lace center. The yarn can be readily used in knitting and plaiting. Woven xylolin treated with a waterproof dressing does not seem to crack by wrinkling or friction to the injury of the water-resisting coat. One would imagine that a fabric of paper yarn would readily ignite and that a lighted match falling on a paper rug could be exceptionally dangerous. The fact is, however, that a burning match stem will do more damage to a woolen or jute rug and be more likely to lead to disastrous consequences. While not uninflammable, an ordinary rug of paper yarn will burn scarcely easier than a wooden floor. Some criticism, apt to be misguiding, has been offered about paper cloth, with an inclination to compare it to sheet paper or rubber, whereas even underclothing made of paper yarn has been found by experience to be satisfactory. Modern authorities on hygienic clothing decry the wearing o garments that are so woven as to permit only a very slow exchange of the toxic emanations of the body with the outer air. Accordingly, there is everything to hope for in a wide use of woven or knit paper cloth garments, not only among people who can not afford to buy more expensive clothing, but also among well-to-do classes, because the paper material is cleanly and readily laundered; even caustic soap, instead of injuring it, makes the fabric softer.

As stated in a previous report, the purposes to which paper yarn can be put are really so diversified that it is difficult to circumscribe its field of usefulness. It can not be expected that it will appreciably decrease the output of other textiles, but on account of its relative cheapness it has claims that neither manufacturer nor humanitarian can well disregard. Literally it is a new yarn. The commercial success already attained by its discovery demonstrates its practical utilization. Conservative German manufacturers consider it a highly welcome and now well-nigh indispensable material for many textile purposes.

* Published in SUPPLEMENT No. 1626, p. 26206.

RECENTLY PATENTED INVENTIONS.

Pertaining to Apparel.

BUCKLE.—J. W. GONCE, Kinderhook, Ala. The invention relates to buckles and more particularly to those applicable to back bands, suspenders and the like. The play of bearing projections in the flange opening allows the engagement or disengagement of a tongue with the locking recesses, and permits the former to adjust itself readily to various thicknesses of straps or webbing which may be used in connection with the buckle.

COMBINED BUST-FORM AND ARM-PAD.—DORA HARRISON, Lansing, Mich. The object of this improvement is the provision of a new and improved combined bust form and arm pad, made essentially of rubber and arranged to permit convenient inflation to any desired degree and without danger of leakage of air and collapsing, to securely hold the article in proper place on the wearer's body, and to insure all the desired comfort to the wearer.

Of Interest to Farmers.

STALK-CUTTER.—R. B. HUMAN, Chickasha, Ind. Ter. This revolving cutter is for use in cutting stalks of any kind upon any character of ground. It is absolutely complete in itself but so constructed that it can be conveniently attached to different wheeled machines, for example, disk cultivators or disk harrows. The cutter may be applied without disturbing operating parts or interfering with their functions, it being also capable of almost instant removal, leaving both it and the machine intact.

Of General Interest.

FOUNTAIN-PEN.—W. K. HOLMES, New York, N. Y. The purpose in this case is to so construct the pen that conveniently-operated means are employed for pressing or collapsing the sack simultaneously approximately its entire length, the pressure being brought to bear parallel with the sack and in a uniform manner. Thus the greatest amount of air is forced from the sack, and when it is permitted to expand a maximum quantity of ink is drawn therein.

SCALE FOR DIVIDING CIRCLES INTO EQUAL PARTS.—O. GAZEL, Havana, Cuba. Mr. Gazel's object is to provide an improved scale for dividing circles into equal parts simply and quickly. With his scale and a proportional divider any circle can be divided in equal parts without computing, drawing, figuring, etc. No time is lost, since there is no trouble in setting the divider points. The proportional divider's long points are set to the standard radius and the other points to the division wanted in the scale. Again open the proportional divider and with the long legs take the given radius of the circle to be divided and at the other point the required space for the division wanted, is found.

BOILER.—C. E. CHAPMAN, Fort Edward, N. Y. One purpose of the inventor is to provide a construction of boiler which will be a rapid producer of steam and one wherein the steam will be heated until when it leaves the boiler it will be in an exceedingly dry state and at a maximum degree of heat. Another, is to construct the boiler with a series of independent coils one above the other, each independently connected with a common water header and a common steam header connected with a steam dome, in the form of a coil, acting as a superheater, being located above the boiler proper.

CLIP-FASTENER.—C. R. SMEAD, St. Paul, Minn. This fastener is for use in connection with files for letters, papers, and the like. An object of the invention is to provide a clip fastener, by means of which the closing flaps of a file may be securely attached one to the other, and which permits the file to be closed or opened by simple manipulation.

LETTER AND NUMERAL RULE.—A. M. WING, Spokane, Wash. The invention pertains to drawing instruments, and its object is to provide an improved letter and numeral rule, which is very simple in construction, easily manipulated and more especially designed for forming numerals and letters of the alphabet, both capital and small letters, without requiring a skilled operator.

PIPE-CLAMP.—G. S. BENEDICT, Kingsland, Texas. The invention is an improvement in pipe-clamps such as are used for withdrawing well casings from wells and other like purposes. Among the objects are the provision of a strong and simple device which is adjustable to take pipes of varying sizes, and which will operate to grip the pipe with increasing force as its resistance to being withdrawn is augmented.

SMOKING-PIPE.—G. W. CLAPP, New York, N. Y. The purpose of the inventor is to provide a construction wherein dual, or a multiple of smoke-conducting channels lead from the mouthpiece to the bowl, and wherein a cleaning finger is used, or multiple thereof, carried by the mouthpiece and adapted to normally temporarily close all the channels, except one through which smoke is drawn, and to so locate and construct finger or fingers, that even when dark one may be shifted to the channel previously in use for the purpose of cleaning and temporarily closing it, at same time opening up a new and clean channel.

LEAD-PENCIL.—C. PINTZ, Budweis, Austria-Hungary. The slider in this invention, and the lead attached to it, may be clamped in position relatively to the holder, so that on the one hand when the pencil is in use the lead is prevented from yielding to the pressure upon its point in writing, and on the other hand the lead when retracted into the holder may be so retained, the design being to obviate the defect which these pencils as at present made are apt to exhibit in consequence of the fit of the slider on the holder becoming impaired by constant use.

HORSESHOE.—A. KWIKKEL, Boyden, Iowa. The invention is an improvement in horse shoes which are provided with detachable calks. The inventor has devised a construction whereby the calks are held securely while in use, but may be easily and quickly detached when required. The shanks are dove-tail shape in cross-section and tapered from end to end, and adapted to slide into the sockets.

SUSPENSORY.—H. A. FRYE, New York, N. Y. The object of the invention is to so support the device that it fits more perfectly and is held more securely in place, permitting the wearer to move about as freely as he may desire without displacing the device or causing any binding or tightening effect. The invention relates more particularly to the supporting means employed.

PICTURE-HANGING DEVICE.—L. RYNEK, New York, N. Y. The improvement refers to a device for hanging pictures and similar articles in a convenient manner, and the principal objects thereof are to provide for adjusting the angle at which the picture is inclined to the wall; to provide for conveniently adjusting the length of the cord or wire by which the picture is hung.

REFRACTORY LINING FOR RETORTS.—F. B. SMITH and G. C. GLYNN, Iola, Kan. The invention is in the nature of a new and improved retort lining and method of applying the same, said lining being intended primarily to be used for protecting retorts or ore muffles used in the distillation of zinc, from the action of corrosive slags at high temperature, thereby prolonging the life of the retorts and saving in zinc.

MOLD FOR SEWERS.—G. GEORGENSON, Wilmington, N. C. The improvement is in expansible molds for use in forming sewers or conduits of various kinds. Adjustment for different forms and sizes may be easily and quickly effected, and the overlapped portions may be quickly adjusted and locked. The mold is also light and easily transported from place to place according to the requirements of work to be done.

GATE.—J. SUTHERLAND, Springer, Ter. New Mexico. The improvements relate to a class of gates which are supported for longitudinal sliding movement by manual effort, and the purpose of the inventor is to provide details of construction for a gate that afford means for opening and closing it with ease. The rotation of a shaft by manual effort through the medium of crank handles or either of them will roll a spur gear along a rack and correspondingly actuate the gate for opening or closing it.

FOLDING CHAIR.—G. H. STRAND, Merrill, Wis. The invention has for its object the provision of a folding chair capable of being adjusted so as to serve as a camp chair, a reclining chair, or a couch. A further object is to provide means adapted to enable the chair to be folded flat so as to be conveniently transported or stored.

Hardware.

HASP.—S. B. PHELPS, Green Hill, Chester Co., Pa. The object of the invention is to produce a hasp which is simple in form and so constructed that it will lie upon the interior; the general purpose being to prevent its being tampered with by a dishonest person. It relates to hasps such as used on chest doors, boxes, or in similar constructions. The fact that the entire hasp is within the interior of the chest and not in position to be reached by an intruder, is not only an advantage from the point of utility, but tends to give the chest a neat appearance.

Heating and Lighting.

DAMPER-REGULATOR.—J. SCALES, New York, N. Y. This regulator is such as is used in connection with boilers or furnaces. The object of the invention is to produce a mechanism for automatically controlling the position of the damper in the flue leading from the fire-box, the object being to reduce the amount of draft when the boiler or furnace becomes too hot or is supplying too great a quantity of steam.

WATER-BACK SHIELD.—S. M. STEVENS, Asheville, N. C. Heat radiated by a hot water boiler connected with a water back attached to a range frequently renders a kitchen uncom-