

and John C. Watkins, of Harrisburg, Oregon, embodies a number of ingenious mechanical contrivances whereby it is more easily controlled and readily adjusted to work at any desired depth in the ground.

Mr. P. McCollum, of Fayette, Mo., has devised a new and ingenious Corn Planter, which is of simple construction and is so contrived as not to clog in wet ground, and to scatter the seeds as it plants them.

W. H. Carpenter, of St. Joseph, Mo., has patented a Gate Hinge, which consists in a rectangular reversible latch pivoted to the gate and constructed so that it is self-latching, and will not be affected by the sagging of the gate. It is valuable to farmers.

Samuel Myers, of Adamsborough, Sharpsville, Ind., has invented an improvement on his Fruit Drier which he patented in April 24, 1877. The supply of heat to the fruit trays is regulated at will, and each tray is independent of each other in the drying process. The improvement consists of the connection with the trays of diagonal partitions and pivoted valves, that open or close the space between the shelves and partitions, for admitting or excluding the heat from the rays.

A Platform Gear for Wagons, invented by B. F. Rix, of Mason, Mich., is made of a solid centerpiece, or of two pieces bolted together, and bent forward and back to the spring block. It is very light, and there is no possibility of its breaking or sagging down and causing the fifth wheel to bind.

In a Combination Hoe patented by D. A. Nelson, of Tyler, Texas, the blade fits into a nib in the hoe head and is secured by a staple and key. A ring binds the parts securely together. Hoe blades of every description may be adapted to this head.

William M. Leaman, of Bullitt's Bayou, La., has invented a Bale Tie which consists of a U-shaped buckle, corrugated lengthwise on the inside, and a metallic strap, the ends of which are corrugated crosswise, for the purpose of being held from slipping when placed to overlap each other.

A Self-Acting Wagon Brake has been patented by Alfred Hart, of San Marcos, Texas. The wagon body is hung so that it is free to receive endwise movement on its front bolster. By rods and cranks this works a brake, which, by the forward movement of the body, is brought against the wheels. The steeper the grade, the more forcible will the brake be applied. A suitable device controls the brake, if so desired.

A Grubber and Stump Extractor, invented by John Moth- ical, of North McGregor, Iowa, consists of a standard so mounted as to be moved about its vertical axis. A chain and pulley are attached to the stirrup, and is wound up by a large spur wheel, which is itself moved by a hand crank on a pinion shaft. It is a ready means of applying power.

Mr. Julius Hartmann, of Louisville, Ky., has patented a new Plow. Its point is curved to give a centre draft, and the mouldboard and point together constitute a wearing surface having a gradually increasing convexity and width back of the center, and a gradually increasing concavity and width forward of the center, up to the beveled portion of the point. This shape is calculated to produce the best results in practice, as respects friction and draft, and turning the furrow. The landside is formed of a bar which is beveled on each side from the bottom upward. The standard is provided with lugs or shoulders, which engage or lock with the upper edge of the mouldboard, and thus relieve its pivots of part of the strain incident to plowing.

Gigantic American Reptiles.

Professor O. C. Marsh in the last number of the *American Journal of Science* states that the museum of Yale College has recently received the greater portion of the skeleton of a huge reptile, which proves to be one of the most remarkable animals yet discovered. It was found on the eastern flank of the Rocky Mountains, in beds which are regarded as corresponding nearly to the Wealden of Europe, and which may be classed as upper Jurassic. The remains are well preserved, but are embedded in so hard a matrix that considerable time and labor will be required to prepare them for a full description. The characters already determined point to affinities with the Dinosaurs, Plesiosaurs, and more remotely with the Chelonians, and indicate a new order, which may be termed *Stegosauria*, from the typical genus here described.

In this specimen, some of the teeth preserved have compressed crowns, and are inserted in sockets. Others are cylindrical, and were placed in rows, either in thin plates of imperfect bone or in cartilage. The latter are especially numerous, and may possibly prove to be dermal spines, having all the essential characters of teeth, as in some fishes. The vertebrae are biconcave, their neural arches being cooified with the centra, and the chevrons articulated. The limb bones indicate an aquatic life. The body was long, and protected by large bony dermal plates, somewhat like those of *Atlantochelys* (*Protostega*). These plates appear to have been in part supported by the elongated neural spines of the vertebrae. One of the large dermal plates was over three feet (one meter) in length.

The present species was probably thirty feet long, and moved mainly by swimming. For its discovery science is indebted to Professor A. Lakes and Engineer H. C. Beckwith of the United States Navy, who found the first remains in Colorado near the locality of the gigantic *Atlantosaurus montanus*, and in essentially the same horizon.

NEW DINOSAURIAN REPTILES.

The gigantic Dinosaur, *Atlantosaurus montanus*, proves

to belong to a lower horizon than at first supposed, and is really from the upper Jurassic. Additional remains on the type specimen, moreover, throw considerable light on the structure of this largest of land animals, and indicate that it is the representative of a distinct family, which may be called *Atlantosauridae*. The size of the original specimen of *A. montanus* may be estimated from the femur, which was about seven feet in length. If the animal had the proportions of a crocodile, it was at least eighty feet long.

Another gigantic Dinosaur, allied to the above, and of scarcely less interest, is represented in the Yale Museum by a nearly complete skeleton in excellent preservation. It is from the Jurassic beds in the Eastern foot hills of the Rocky Mountains, but from a somewhat lower horizon than the type of *Atlantosaurus*.

The cervical vertebrae are strongly opisthocelous, and are rendered comparatively light by large pneumatic cavities in the centra. The anterior dorsals have similar characters. The posterior lumbar have the articular faces very nearly flat, and transverse. The sacral vertebrae are more solid, and have their transverse processes nearer the middle of the centra than in *Atlantosaurus*. The anterior caudals are biconcave, and their interior structure is cancellous. The chevron bones differ from those of most known Dinosaurs in having the superior articular ends of the rami not united, but separated from each other, as in the Mosasauria with free hæmapophyses.

This animal must have been between fifty and sixty feet in length, and more than thirty in height when erect.

Another huge Dinosaur, apparently of the same genus, but of smaller size, is represented in the Yale Museum by the more important parts of a skeleton, in remarkable preservation. In this specimen the cervical vertebrae have the walls of the centra very thin. The caudals preserved are elongated and slender, indicating a long tail. The femur is comparatively short, and without a third trochanter. The great trochanter is much lower than the head of the femur, and continuous with it. The metapodial bones indicate a foot of medium length.

The known remains of this species are from the same geological horizon as those above described. They indicate an animal at least thirty feet in length.

New Mechanical Inventions.

In a Universal Joint patented by Phineas Burgess, of Brooklyn, New York, the flattened ends of the shaft have the inner lugs formed upon them, at such a distance from the outer or ordinary lugs as to rest against the inner side of the coupling ring, interposed between them and the outer lugs, and receive and support the inner ends of the coupling bolts.

A Brick Machine has been patented by W. J. Blair, of Oil City, Pa. The prepared clay is introduced from the mill through an orifice in the box, whence it is pressed down through orifices into a mould by a follower worked by a lever. A V-rod fitted with wire passes along the top of the mould and separates the clay in the mould from the clay in the guide spouts, so that when the loose bottom of the box is lowered the filled mould may be easily drawn out and replaced with an empty mould.

James White, of North Adams, Mass., has invented an improvement in spindles and their bearings. The spindle is provided below the upper shoulder with a second shoulder, between which and the collar of the upper bearing a small annular air chamber is formed, which surrounds the upper chamber. The oil is introduced through holes in the upper bearing, and any waste oil is caught by a cap-shaped support at the bottom.

Hermann Springborn and C. H. Bauch, of Holyoke, Mass., have invented an improvement on their cloth-finishing machines patented July 17, 1877. It consists in constructing the concave bed with a detachable unoxidizable jacket, and in a locking device for the weight-adjusting levers. The bed with brass jacket is much cheaper than one made wholly of brass.

A Blind-Slat Planer, patented by R. S. Griffin, of Worcester, Mass., consists in combining with a suitable bed and laterally adjustable guides, suitably mounted, a rectilinear reciprocating plane, the cutters of which are so arranged that they will dress one side and one edge of a slat. A novel device keeps the slat down firmly on the bed, and discharges the dressed slat from the machine.

In a rag-washing machine for paper making, patented by F. A. Cloudman, of Cumberland Mills, Me., a cylinder is arranged at the inside with a number of curved buckets extending from the circumference to a central outlet and flanged at the edges. The volume of water is lifted to a lesser height, by reason of the peculiar form of the buckets and their inclination toward the outlet. The buckets are best made of a continuous piece of wood and are surrounded with wire cloth to retain the rags.

R. S. B. Thornton, of Pawtucket, has patented an improvement to be applied to the Noble Wool Combing Machine. A shaft drives a flanged pulley keyed on it, which communicates motion by an endless belt to two other flanged pulleys. They are fitted on longitudinally slotted pieces and brackets secured by thumb screws.

An improved Traction Wheel has been patented by W. H. Trenwith, P.O. Box 4,068, New York city. It consists of a movable web or center section, supported on rollers or wheels arranged within a revolving traction wheel of larger diameter, the web supporting an axle made of two symmetrical sections, to one section of which suitable operating

mechanism is applied. It furnishes a simple means for starting the vehicle and stopping the same, without the use of brakes.

Photo-Printing Plates.

There are two methods of producing the type plate from the negative, namely: the swelled gelatin and the dissolved gelatin processes. In the latter process, a thick film of bichromatized gelatin is spread on a sheet of glass, and upon this a sun picture of the negative is made, as in ordinary photographic printing. Wherever the light strikes, which in this case is upon the writing, the gelatin becomes insoluble. The gelatin film is then moistened with cold water, which causes the soluble portions between the lines to swell up and leave the writing sunken. A plaster cast is taken from this, when the writing will appear in a raised line upon the plaster. This cast is then pressed into wax; the wax impression is dusted over with plumbago to give it a metallic conducting surface, and is then placed in a galvanic bath, remaining there from one to three hours, producing an electrotype plate from which the printing is done. It is found, however, that the lines on the plaster cast are not high enough to make a good type, and before pressing the cast into the wax, the spaces between the lines are routed out, or dug out, with a tool, to any required depth. Another method of accomplishing the same result is first to take the wax impression, the workman afterward building up the spaces on the wax, before putting it into the galvanic bath. Still another way is to take a plaster cast from the one already made, which will reverse it, the lines appearing sunken, and from this last cast to make a stereotype plate in type metal, and rout out the spaces in the plate itself from which the printing is done.

The dissolved gelatin or photo-electrotype process is somewhat more simple, and is the reverse of the one just described. The film of gelatin is made very much thicker than before. A light sun picture is taken, leaving sharp outlines. The surface is moistened and the gelatin washed out, slightly deepening the spaces between the lines. The film or plate of gelatin is then dried, and these depressions are filled with an opaque paste, and the plate is again exposed to the full glare of the sun, by which the chemical effect of the light upon the lines is intensified and deepened, so that the gelatin is hardened to a considerable depth and a gradually increasing breadth, making a firm foundation for the type. The plate is again washed and the spaces deepened to any extent desired. It is then dried, and can be printed from directly, as a type plate, or electrotyped as before described.

The negative can also be used in connection with the zinc etching process, by which the writing is transferred to a zinc plate, and the spaces between the lines eaten out by acids.—*Franklin Journal*.

NEW BOOKS AND PUBLICATIONS.

A MANUAL OF THE MECHANICS OF ENGINEERING AND OF THE CONSTRUCTION OF MACHINES. By Dr. Julius Weisbach. Vol. II. Translated from the Fourth German edition, by Professor A. Jay DuBois, Ph.D., Published by John Wiley & Sons, 15 Astor Place, N. Y. Price \$6.00.

Dr. Weisbach's great work has for years been known as the best standard authority on its subject. The progress of discovery and invention has, however, necessitated its revision and adaptation to modern ideas, so that in the portions relating to practical applications of mechanics the changes have been extensive and far-reaching. The complete work consists of three volumes. The last American translation of the first volume was made by Mr. Sekley B. Cox in 1870, and it was the intention of the translator to complete the whole work. Being unable to carry out this plan, Mr. Cox withdrew in favor of Professor DuBois who has carried on the labor through the present volume of 1,150 pages in a manner which cannot be too highly commended. Although this volume is one of a trio, it is nevertheless rendered complete in itself by the insertion of an introduction covering those portions of volume I, which are most commonly referred to in the text. It treats more especially of the application of the general principles of mechanics, and is divided into two sections. The first treating of the application of the principles to structures of stability has been judiciously omitted as its matter is obtainable in many other English works. This book forms portion of the second section, namely: I, which discusses the various motive powers and their recipient machines, hydraulic and air motors. Part II, relating to heat, steam, and the steam engine will constitute another volume. The work is one which inventors and engineers should study carefully and closely. As here produced it is in admirable form. The illustrations are new, copious, and fine, and the typography admirable. Professor DuBois has hitherto done some capital work in the way of translating foreign technical treatises, but none better than this. The edition, we may add, has been specially authorized by Dr. Weisbach, son of the late author.

THE SILVER COUNTRY OR THE GREAT SOUTHWEST. By Alexander B. Anderson. Published by G. P. Putnam's Sons, 182 Fifth avenue, New York city. Price \$1.75.

This is a book on the mineral wealth of the former kingdom of New Spain, comprising Mexico and the Mexican cessions to the United States in 1848 and 1853. It describes the resources of the country and shows that the Southwest is producing each year two thirds of the silver of the whole world. The work is well illustrated by maps, and in view of the present agitation of the silver question will be read with timely interest.

FORMULÆ FOR THE CALCULATION OF RAILROAD EXCAVATION AND EMBANKMENT. By John Woodbridge Davis, C.E. Illustrated.

This is a second edition of a work that has already met with much favor. It has been adopted as a text book in the School of Mines of Columbia College and many other institutions of the kind. It has been revised and improved so as to be still more valuable to engineers.

BEAUTIFUL HOMES, OR HINTS IN HOUSE FURNISHING. By Henry T. Williams and Mrs. C. S. Jones. Henry T. Williams, Publisher, New York. Illustrated. Price \$1.50.

Household taste is but a synonym for household culture. This work is designed to cultivate this taste by narrating and illustrating everything relating to the picturesque furnishing of bedrooms, halls, parlors, and sitting rooms, so that any lady may by following its directions make a winning and beautiful home. The contents relate specially to house furnishing and furniture, and are profusely illustrated.

"Fret Sawing," "Household Hints," and "Needlework and Embroidery," are other works issued by the same publisher in the same style, at fifty cents each. The ladies will find them of much value in the household.