

State Geological Survey, to make his famous exploration of the great cañons of the Colorado.

When the war broke out he was elected a member of the U. S. Sanitary Commission, and was instrumental in extending the work of the commission throughout the Western States. After the war was over, he was called to fill a chair of geology and paleontology in the then recently established School of Mines of Columbia College, on the duties of which he entered in the autumn of 1866. In this capacity he continued until December, 1890, when a sudden stroke of paralysis compelled him to relinquish work. A year's leave of absence was promptly granted him, but at the expiration of this term he was unable to return, and he was made professor emeritus.

He was appointed paleontologist to the United States geological survey in 1884, and assigned to the charge of certain portions of fossil botany and fishes, concerning which he reported on the "Fossil Fishes and Fossil Plants of the Triassic Rocks of New Jersey and Connecticut Valley" (Washington, 1888), and on "The Paleozoic Fishes of North America" (Washington, 1889). Material on the fossil plants of the cretaceous and tertiary rocks of the far West was for some time in his possession, but had not been sufficiently completed for publication up to the time of his death.

Of honors he had many. In 1867 the degree of LL.D. was bestowed on him by the Western Reserve College, and in 1888 the Geological Society of London conferred upon him its Murchison medal, which was the first time this honor had been bestowed upon an American geologist. It was then well said of him that "He is a geologist after Murchison's own heart—keen of eye, stout of limb, with a due sense of the value of detail, but with a breadth of vision that keeps detail in due subordination."

In his death science loses one of its masters, for he was rich in those accumulated experiences which we call wisdom. Humanity loses a friend, for seldom has a life been spent in more active philanthropy; but his influence cannot die, and will live to

"Reach thro' nature, moulding men."  
—M. B.

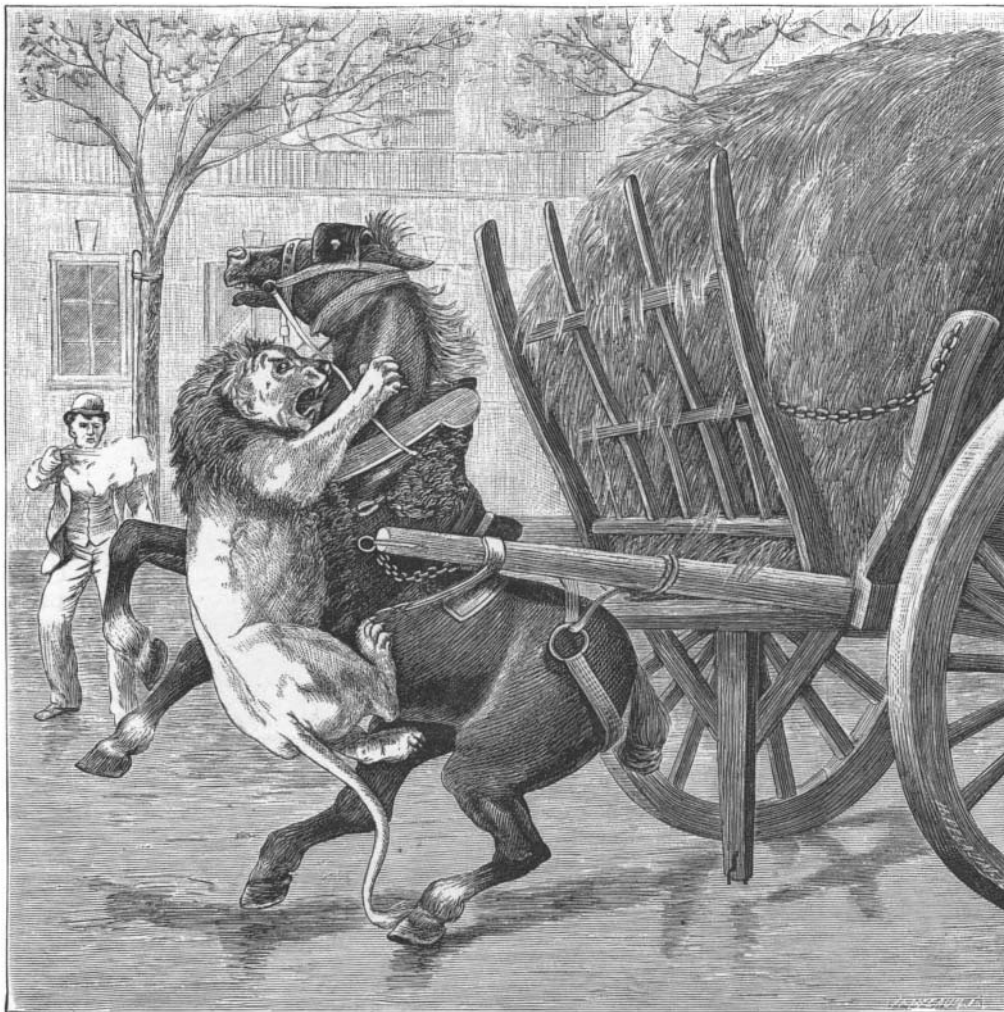
#### Draining of Lake Angeline.

Lake Angeline, in the Marquette Range, was a little lake near Ishpeming, Mich. The Cleveland Iron Mining Company and the Lake Superior Iron Company owned together about four-fifths of the area of the lake. The rest was owned by the Pittsburg and Lake Angeline Company. The lake was a beautiful sheet of water nearly a mile long, one-third of a mile wide, and about forty-five feet deep in a number of places. Its average depth was 20 feet. The operations of the mining companies have for some time extended beneath its bed, and it was determined by the mining companies to

drain it. Operations were begun last spring, the contract being awarded to C. B. Howell, of this city. The work began with sinking a crib and putting in operation a centrifugal pump, with 20 inch suction and 22 inch discharge, and a capacity of 15,000 to 20,000 gallons per minute. The water was discharged into the Carp River. A few days ago the work was brought to a successful culmination. The lake, of 800,000,000 gallons estimated capacity, was emptied, and a handsome profit is expected as the result of the operation.

#### A LION AT LARGE.

The accompanying illustration represents an incident which lately occurred in the streets of Bordeaux. A traveling menagerie had taken up its quarters on the Boulevard de Cauderon, on the outskirts of the city near the Parc et Jardin d'Acclimatation, and, during feeding time, one of the lions managed to evade the keepers and escape from his cage. The wild beast tore down the spacious boulevard to the consternation of the passers by, and suddenly turned into a by street. Here he observed, outside a tavern, a sleepy cart horse



AN ESCAPED LION ATTACKS A DRAY HORSE.

The firing does not seem to have injured the lion, for as soon as he had had his fill of horse flesh he turned to continue his promenade. At this moment a young man proposed to attempt to lasso the beast, and covered by the revolvers of the *gens d'armes*, he made the attempt. After many futile efforts, the noose eventually fell about the neck of the lion, and, being pulled tight by the excited crowd of pursuers, the animal was dragged, half-strangled, back to his den. It was fortunate that the cart horse was the only victim of this unusual excursion.—*Daily Graphic*.

#### Antiquity of the Saw.

The saw is an instrument of high antiquity, its invention being attributed either to Dædalus or to his nephew Perdix, also called Talos, who, having found the jaw of a serpent and divided a piece of wood with it, was led to imitate the teeth in iron. In a bass-relief published by Winckelmann, Dædalus is represented holding a saw approaching very closely in form to the Egyptian saw. St. Jerome seems clearly to allude to the circular saw, which was probably used, as at present, in cutting veneers. There are also imitations of the use of the center bit, and even in the time of Cicero it was employed by thieves. Pliny mentions the use of the saw in ancient Belgium for cutting white building stone; some of the oolitic and cretaceous rocks are still treated in the same manner, both in that part of the Continent and in the south of England. In this case Pliny must be understood to speak of a proper or toothed saw. The saw without teeth was then used just as it is now by the workers in marble, and the place of teeth was supplied, according to the hardness of the stone, either by emery or by various kinds of sand of inferior hardness. In this manner the ancient artificers were able to cut slabs of the hardest rocks, which consequently were adapted to receive the highest polish, such as granite, porphyry, lapis-lazuli, and amethyst.

#### Carrying Capacity of Wires.

The safe carrying capacity of a wire is that current which it will convey without becoming painfully warm when grasped in the closed hand. In reference to this it must be remembered, says the *Electrical Age*, that this test cannot safely be made with the wires carrying currents for arc lights, and it is intended to be applied only with reference to the conductors of incandescent lights. These may be handled

without risk; but with the conductors of the arc lights, where, as is usually the case, there are a number in series, a severe shock may be experienced on touching the wire, and if a ground connection existed by chance elsewhere, and some other conditions were present by which the full force of the current passed through the body, this shock might be fatal.

#### RECENTLY PATENTED INVENTIONS.

##### Railway Appliances.

**METALLIC TIE.**—Andreas Mattijetz, Giddings, Texas. This tie is made of U-shaped channel iron, with inverted U-shaped cross plates secured by their sides to the sides of the channel iron, flanged lugs secured to the cross plates being adapted to engage the bases of the rails to lock them in position on the cross plate, while flanged vertically extending plates are passed through slots in the ends of the channel iron. The tie is designed to be cheaply manufactured and very durable, preventing the spreading of the rails and displacement of the ties, especially on curves.

**RAILROAD FROG.**—John S. McAdams, Ashland, Pa. A pivoted point is by this invention formed of two rails with an intervening throat piece bolted together and pivoted at the juncture of the switch rails and the rails of the main track, and connected with a pivoted letter, the arrangement being such that a train passing over the frog has a continuous bearing, and jar and noise are avoided. As the wheels have a full bearing, with trains moving in either direction, on the main track or turn-out, the wear and tear are reduced to a minimum.

**ROD STRAIGHTENER.**—Patrick McCann, St. Ignace, Mich. This is an improved clamp for straightening metal rods, bars or braces, and more particularly for straightening sliding switch rail rods or braces on railroads. The improvement consists of a screw clamp with attached turning or pressure foot, which can be readily employed by one man, and without removing the rods or braces from the rails, or necessitating any stoppage of trains.

##### Electrical.

**ELECTRIC GAS LIGHTER.**—Lucien M. Kilburn, Council Bluffs, Ia., and Scott Van Etten, Omaha, Neb. This invention relates to automatic lighting and extinguishing burners in which an oscillating gas valve in the gas tube is opened and closed by armatures and levers operated by magnets, a sparking device igniting the gas when it is turned on. The improved burner is designed to have greater efficiency, capacity, and certainty than has heretofore been afforded by such burners, while obviating all danger of leakage of gas through the valve and burner.

**LIGHTNING ARRESTER.**—William R. Garton, Keokuk, Ia. An armature is arranged to slide in a solenoid having at one end a guide rod which receives a flexible conductor, and at the opposite end a carbon rod, while a pair of serrated plates are arranged with their faces near each other, one of the plates being connected with the ground and the other normally in contact with the carbon carried by the armature. A closed chamber, nearly airtight, incloses the upper surface of the lightning arrester plate and the carbon carried by the armature. This improvement is designed to protect all electrical apparatus connected with the lines, and the dynamos and lamps upon the lines.

##### Mechanical.

**WRENCH.**—Daniel C. Wiest, Mohrsville, Pa. This is a simple, strong, and durable ratchet wrench, readily adjustable to nuts of various sizes, and which can be conveniently operated. It is provided with improved means for changing the ratchet, so that the wrench may be used either as a right or left hand

wrench. It has a revoluble jaw-holding nipple, held to turn in an interior aperture of the wrench head, assisting the action of the jaws.

**BOX MACHINE.**—Charles W. Roberts, Lawrence, Kan. Box blanks may, by the machine provided by this invention, be rapidly and accurately shaped and held in place until they are fastened by nails or otherwise. Upon a suitable support is a stationary form, below which are vertically movable and pivoted jaws and a pivoted bottom plate, in combination with means for simultaneously operating the bottom plate and jaws. The machine is especially adapted to make berry and other light boxes, such as are usually formed of wood veneers, paper board, etc.

**BELT HOLDER.**—William F. Cleveland, Rounthwaite, Canada. This is a simple and readily applied device, more especially designed for use on thrashing machines, etc., where driving belts are exposed to the wind, the device holding the belt in proper place and preventing displacement by the wind. The device rises and falls with the ordinary vibration of the belt, thus lessening the friction, and it also serves as a belt tightener.

**DIFFERENTIAL HOISTING MACHINE.**—Charles F. Cliff, Durham, Canada. In this construction a fixed and a revoluble internal gear wheel are employed, a wheel receiving motion from the fixed wheel and imparting motion to the other wheel, there being two sets of intermediate gearing, with which also the driving shaft is connected. The differential gearing is very simple and compact in construction, and prevents any accidental backward motion of the drum shaft when the drum is heavily loaded.

##### Agricultural.

**CULTIVATOR.**—James Birch, North Ontario, Cal. This is a light and durable cultivator for orchard use, provided with a suitable riding frame for the driver. The cultivator frame can be readily raised or lowered while the machine is moving in a straight line or rounding curves, and the various shovels and scrapers employed can be quickly and easily attached to and detached from the cultivator frame. The riding frame may be detached, if desired, and the machine used as an ordinary cultivator.

**STUMP PULLER.**—Adams C. French, Rapid City, South Dakota. The frame of this device carries an upright shaft, formed with conical large and small cylindrical portions, to which the bore of the main drum is conformed, having at its upper end a tenon-like portion on which is journaled a second drum, above which, on the upright shaft, is journaled a sweep, pins on the sweep being movable into and out of engagement with the main drum or the second drum. In addition to its use in stump pullers, this drum may be used with advantage in derricks and other hoisting machines.

##### Miscellaneous.

**LUMBER DRIER.**—John W. Piver, Americus, Ga. A lumber support is arranged in a drying room of a house warmed by a heater, and is composed of an inclined side support and a base support formed of a series of step-like blocks having their upper surfaces approximately at a right angle to the side support, whereby lumber may be piled in an edgewise inclined position, without the use of racks having