

ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

For the computations (which are approximate only) and for the observations collected in the following notes, I am indebted to students.

M. M.

Positions of Planets for November, 1873.

Mercury.

On the 1st, Mercury rises at 8h. 33m. A. M., and sets at 5h. 39m. On the 30th it rises at 7h. 2m. A. M., and sets at 4h. 38m.

Venus.

On the 1st Venus rises at 4h. 17m. A. M., and sets at 3h. 51m. P. M. On the 30th Venus rises at 5h. 27m. A. M., and sets at 3h. 26m. P. M.

Venus can best be seen at early morning at present, but a small telescope will show it in the daytime; it comes to meridian or south a little after 10 A. M. during the first half of the month, and before 10h. 30m. all through the month, its altitude in this latitude being about 45° on the first of the month, and 32° on the last of the month.

Mars.

Mars, which has been so favorably seen through the summer months, is at too low an altitude and sets too early in November to permit one to make good observations.

It rises on the 1st at 11h. 52m. A. M., and sets at 8h. 41m. P. M. On the 30th it rises at 49m. after noon, and sets at 8h. 39m.

Jupiter.

Jupiter is very unfavorably situated for observation at this time.

On the 1st of November it rises at 2h. 44m. in the morning, and sets a little after 3 in the afternoon. On the 30th it rises at 1h. 13m. in the morning, and sets at 1h. 24m. P. M. Its apparent diameter is increasing, and it reaches a greater altitude from day to day, when it comes to meridian. It is moving among the stars of *Leo*; is east of the star π *Leonis* on the 1st, and on nearly the same parallel of declination. On the 30th its diurnal course is very nearly in the celestial equator, its declination being only 1° 37' N.

Saturn.

Saturn, which during the summer months has been so beautiful, is becoming smaller, and is setting earlier.

It rises on the 1st of November at 0h. 32m. A. M., and sets at 9h. 50m. P. M. On the 30th it rises at 10h. 45m. A. M., and sets at 8h. 7m. P. M. It should be looked for early in the evening, in the southwest, among the stars of *Capricornus*. On the 30th it has nearly the same right ascension as the double star of *Capricornus* known as α^2 , which can be seen with the eye; and an imaginary line from this star, running below it some 9°, will reach Saturn.

Uranus.

On the 1st Uranus rises at near 11 P. M., and sets at 1h. 17m. A. M. On the 30th it rises at 9h. 3m. P. M., and sets at 11h. 23m. A. M. It is among the small stars of *Cancer*, and can be seen with a small telescope.

Neptune.

Neptune rises on November 1 at 4h. 25m. P. M., and sets at 5h. 27m. A. M. On the 30th Neptune rises at 2h. 29m. P. M. and sets at 3h. 33m. A. M. It cannot be seen without a good glass.

Spots on the Sun.

The record of sun spots by photography is from the 9th to the 13th inclusive, with the omission of Sunday, the 12th. On October 9th, one pair of small spots was near the western limb of the sun, another pair of larger, circular spots was between the eastern limb and the center, and an elongated spot was at a short distance from the eastern limb. On October 10th, besides a change of position, owing to the revolution of the sun on its axis, a fresh spot appeared, accompanying the elongated spot of the previous day. October 11th showed merely a change of position from the sun's revolution. On the 13th, the western pair had disappeared in consequence of the daily motion, the larger spot of the eastern pair had become circular, and, between it and the eastern limb, two small spots had appeared. Photographs of the 14th, 15th, 16th, and 17th show only daily change of position. On the 16th and 17th, the group nearest the western limb was surrounded by conspicuous faculae.

Amount of Rain.

The rains in October have been very heavy.

The rain which fell between the morning of October 6 and the afternoon of October 7 amounted to 2.3 inches.

The rain which fell between the evening of October 19 and the morning of October 21 amounted to 3 inches.

Death of Donati.

Professor Donati, the director of the Astronomical Observatory in Florence, died recently in Vienna, where he had just arrived to attend to duties connected with the exhibition. His name is connected with a comet discovered by him in June, 1868, which, during the following August, passed around the sun within the orbit of Venus, exhibiting a nucleus as bright as Arcturus, and a tail of great brilliancy and more than twenty degrees in length.

The Hayden Exploring Expedition—Remarkable Natural Curiosities.

The last Congress authorized the geological and topographical survey of Colorado Territory, under the direction of the Secretary of the Interior, by whom the active work was committed to the charge of Professor Hayden. James T. Gardner was the geographer of the expedition, and he gives a variety of interesting particulars concerning the location of the mountains. The district surveyed comprises

the grandest portion of the Rocky Mountains, where the highest peaks are found. The area surveyed was about 160 miles broad, and embraced Middle Park, South Park, and the Southern San Luis Park. The number of mountains surveyed and mapped is astonishing, large numbers of the peaks measuring from 13,000 to 14,500 feet in height. The triangulation extended over 30,000 square miles.

Professor Hayden reports some very interesting particulars in a letter to the *Evening Post*.

The Explorers' experience on the Electric Mountains—a high and much exposed range separating San Luis Park from Wet Mountain valley—was most amusing. They could scarcely handle their instruments, sparks being elicited at every touch; their rifles, too, snapped under the electric influence, and were in continual danger of going off; while, when caught in a thunderstorm, their hair literally stood on end. The whole party experienced shocks more or less severe, but none were injured.

NATURAL SODA WATER SPRINGS.

These are at Colorado Springs, three days from Cañon City. The wide reputation of these springs is not undeserved, and the different ingredients with which the waters are charged, considering their close proximity, is quite remarkable. The waters of the main springs contain respectively iron, soda, and sulphur, together with other substances in minor quantities. The soda spring is particularly interesting, being heavily charged with carbonic acid gas, which bubbles up in a lively manner. Inverting your glass and plunging it quickly into the spring, you obtain a delicious draft far superior to any ordinary soda water. The water is led into bath houses, and is considered very efficacious in the relief of rheumatism. It is certainly most refreshing. The hotel accommodations are excellent and their situation very beautiful, built as they are in one of the main cañons leading up to the Rocky Mountains and entirely shut in by the foot hills. Pike's Peak rises grandly above all, forming the main feature in the scenery.

CURIOUS SAND HILLS.

One of the most wonderful sights of the exploration was encountered at the entrance of the pass. The wind sweeping down the valley is drawn towards the narrow gorge which furnishes the passage through the mountains, and has piled up a range of sand dunes seven hundred feet above the plain. They are several miles in extent, and, upon approach, glistening under the southern sun, resemble in their brilliancy mountains of pure snow; and the crossing was effected with even more difficulty than it would have been over a snowy range.

PLACES OF INTEREST.

The neighboring country contains many places of curious interest, such as "Monument Park" and the "Garden of the Gods." The former consists of a valley filled with pillars of hardened limestone, which have been left standing, the softer material having been eroded by the action of water and the atmosphere. As one looks upon these great monuments of Nature, he feels as if they might mark the resting place of the dread giants of the story books. The "Garden of the Gods" is of similar construction, only the remaining rocks are higher and more conical in shape, the material being a red sandstone; the pointed spires, upon approach, resemble a gothic cathedral.

PIKE'S PEAK.

A favorite expedition is the ascent of Pike's Peak, a feat that is now practicable even for ladies. A new trail has been constructed to the top, and a halfway house built to accommodate those who stay overnight, thus enabling them to reach the summit early in the day, when the atmosphere is clear and the view most extended. A signal station has been established on the summit by the War Department for the benefit of "Old Probabilities," forming an object of interest to those who reach the top.

RAILWAY RELIGION.—During the homeward journey of the western delegates to the recent Evangelical Alliance gathering in this city, a religious meeting was held on board of one of the trains, in a Pullman parlor car especially granted for the occasion. The returning delegates crowded the car, which was provided with an excellent organ, and had a splendid time of it; stringing out their prayers, hymns and exhortations for a distance of over sixty miles. Thus it is that science lends her aid to assist religionists. But it is ten to one that these divines will get up in their pulpits next Sunday and denounce scientific men as servants of the evil one, infidels and scoffers, because, having found out that the world was not formed in a week, they are bold enough to say so.

THERE is to be daily steamer service between New York and Liverpool, on the Cunard line. The company, we understand, are to withdraw their vessels from the West India trade and assign them to this duty. Eight new ships for this line are now in progress of construction at the yards of Messrs. J. & G. Thomson, on the Clyde.

Inventions Patented in England by Americans.

(Compiled from the Commissioners of Patents' Journal.)

From September 30 to October 9, 1873, inclusive.

CARBURETING AIR.—F. Cutting, Woburn, Mass.
CONNECTING HOSE.—N. Thompson (of Brooklyn, N. Y.), London, England.
CONNECTING HOSE.—N. Thompson (of Brooklyn, N. Y.), London, England.
FIRE ARM.—Providence Tool Company, R. I.
GUNPOWDER.—L. DuPont et al., Newcastle, Del.
KNIVES AND FORKS.—H. Bramhall (of New Britain, Conn.), Sheffield, Eng.
LAMP BURNER.—T. Silver (of New York city), London, England.
LAMP.—R. Hitchcock et al., Watertown, N. Y.
LIFE PRESERVER MATTRESS.—H. B. Mountain, New York city.
POWER PRESS.—N. C. Stiles, Middletown, Conn.
PRESSURE GAGE.—G. A. Everett (of New York city), London, England.
PUNCH.—I. P. Richards, Whitesville, Mass.
STEAM LUBRICATOR.—W. Hamilton, Pa.
TREATING CAST IRON, ETC.—W. M. Arnold, New York city.

Recent American and Foreign Patents.

Improved Mode of Connecting Pitmen with Shafts.

Rudolph Cleaveland, Covington, Pa.—This invention consists in the mode of relatively constructing a bar and hand crank shaft, so that power other than that of the hand may be employed to operate. To the upper end of a vertical churn shaft is detachably attached bevel gearing communicating with a horizontal shaft. One end of the shaft projects, is flattened, and has a longitudinal slot formed in it. A crank is arranged so that the churn may be operated by hand power when desired, or a bar, in one end of which is formed a slot to receive the flattened end of the shaft, when it is secured in place by a spring catch pin. The other end of the bars slotted to receive the end of the shaft of the driving power, where it is secured in place by a bolt and nut.

Improved Lamp.

Louis Berns, Middletown, N. Y.—This invention consists in the combination, with a loose drip cup, of the sections of a lamp column connected by intermediate rods, wide enough apart to allow the insertion and removal of drip cup.

Improved Harvester Rake.

James Irvine, Parkersburg, Iowa.—This invention furnishes an improved elevating rake for attachment to reapers and mowers to convert them into harvesters. As the shaft rotated by the driving wheel revolves, the rake will sweep across the lower part of the platform parallel, or nearly so, with the cutter bar, so as to collect the cut grain, and gather it into a gavel against the side board attached to the inner edge of the said platform. As the shaft continues to revolve, the rake slides the gavel back along the side board, a spring allowing the rake to accommodate itself to the size of the gavel. As the gavel approaches the rear inner corner of the platform, it is pushed into a trough attached to said corner. As the rake passes the end of the trough a guide pin enters a sharp angle in a guide groove, which swings the rake around, so that it may move forward along the outer part of the platform into proper position to collect another gavel. A small spring gate placed in the guide groove just in front of the sharp angle in said groove, which spring is pushed back by a pin and serves the double purpose of guiding said pin fully into the said sharp angle, and preventing it from leaving said angle by the route by which it entered it. The gavels are removed from the trough by binders standing upon the platform, and are laid to be bound upon the tables at the front and rear ends of the said platform.

Apparatus for Arranging Type for Type Setting Machine.

D. Brainerd Ray, New York city.—This invention consists of a new and improved apparatus for arranging type in rows for a type setting machine, and is designed to facilitate type setting by machinery. The construction and operation are as follows: A series of hoppers or troughs is arranged, one for each letter and character used in printing, upon a frame, at a convenient angle. Into these hoppers the type are distributed by hand, just as they are now, into the boxes of a type case. The type slide down to the channels or tubes, some having their notches turned one way, and some the opposite way; but the bottom and sides of said hoppers are so shaped that the type are all turned up edgewise as they enter the channels, and these are shaped so that they must pass through them on the edge or narrow side.

Improved Pruning Hook.

A. P. Bettersworth, Carlinville, Ill.—This invention relates to the class of pruning hooks in which a hook and sliding knife are so arranged that their cutting edges are made to approach each other by means of toggle or jointed levers, said effect being produced by a direct pulling or tractive force applied to the handle of the implement. The invention consists in the arrangement of double levers and a spiral spring in connection with a cutting hook and chisel adapted to slide on each other, said levers serving, by their extension, to operate the cutting devices, and the spring to retract and hold the same close together for renewing the operation.

Improved Steam Engine Governor.

Stephen P. Ruggles, Boston, Mass.—This invention consists of a pair of rotating registering disks side by side in the steam pipe, one of which is turned by clock work, or any power independent of the engine to be regulated, and the other is turned by the engine. The two are so connected that neither can advance or retrograde relatively to the other more than sufficient to close or open the register. The one turned by the clock geared to run as fast as the other should be driven by the engine, and they are so set relatively to each other that if an additional labor is imposed on the engine the retrograde motion of its disk will open the register and admit steam; or, if the labor is lessened the advance of the disk will close the register and shut off steam, and thus maintain the required uniform speed.

Improved Car Coupling.

Peter Kendrick, Trenton, N. J.—The object of this invention is improvement on the car coupling of Depeu and Hall, patented July 2, 1867, and Smith and Utton, patented September 13, 1871; and the invention consists in employing a headed bolt sliding in opposite slots of the drawhead and a link with a cross stud for strengthening it.

Improved Rice Cleaner.

David L. Geer, Lake City, Fla.—This invention consists, first, in the rotating shaft of the machine, with blades so arranged spirally, and turned in opposite directions, as to throw the grain upward and backward and forward; and, secondly, in providing the cylinder into which the grain is delivered with a bulge, which form a cavity wherein the grain is forced by the spiral blades, thereby effecting the hulling.

Improved Traveling Thrashing Power.

Richard W. Faris, Murfreesborough, Tenn.—This invention is intended to furnish an improved power for driving a thrasher, so that each shock of wheat or other grain may be thrashed while passing to the next shock thus saving much of the labor required in harvesting grain. The invention consists in the combination of the gear wheels connecting with the rear wheels of the wagon and communicating with a transverse shaft. Upon the shaft is placed a gear wheel about eighteen inches in diameter, and which is provided with a clutch upon each side, so that the shaft may be kept in motion when the wagon is turning, or even when one wheel is standing still. The upper part of the wheel projects through an opening in the bottom of the wagon box, and connects by a gear wheel to a short shaft which is attached to a band wheel, about twelve inches in diameter, and which is connected with the pulley of the thrasher engine. By this arrangement the thrasher cylinder will make about seventy-two revolutions to each revolution of the wheels. A still greater speed may be obtained by varying the size of the wheels, or by employing more wheels.

Improved Coffee Pot.

Margaret J. Stubbings, Youngstown, Ohio.—This invention consists in a cylindrical steam cover, connected, by pipes, with a perforated drum, and a muslin bag attached to it. The steam generated in the bottom part of the pot forces the boiling water continually over the coffee in the bag till the full strength of the same is extracted.

Improved Oil Can.

Orris H. Warren, Baldwinsville, N. Y.—This invention consists mainly of a tubular rod, of suitable length, in which is an oil receiving chamber, and to which is secured a hollow handle, in which the air chamber is arranged. From the oil and air chambers the oil is forced out through the discharge pipe at the end of the rod by means of a pump arrangement operated by the thumb. Projecting lugs or ears, at the end of the discharge pipe, raise the covers of boxes or cups over bearings.

Improvement in Indexing Books.

John S. Hicks, Roslyn, N. Y.—This invention relates to the indexing of books, and consists of a volume provided with index tags bound into the back with its leaves, and projecting beyond the side edges thereof.

Improved Springs for Vehicles.

George W. Lewis, Portsmouth, Va., assignor to himself and C. W. Walker of same place.—This invention consists in two lever springs, the long sections of the upper division being held by the backwardly curved ends of sections of the lower portion. The two divisions are separated by a considerable space by the metal or wood block confined between them in a yoke, which also tends to utilize the power of the springs. The ribs are raised in the upper surface of each leaf, at the center, by indenting the under surface, which ribs are nested with the indentations.