from the upper deck, are then brought into position, and the vessel is thus secured. Pumping is then continued until the vessel is raised clear of the water. These adjustable bilge blocks are very broad, and form an unusually firm cradle, which cannot be displaced even when struck by a heavy sea. The lifting power of the dock is obtained from the pontoons only, the buoyancy of the vertical side sustaining merely its own weight.

The special feature of this dock, from which it has been named, is seen in the next operation, viz., that of depositing the vessel on the staging. Fig. 3 shows an end elevation or section of the staging, which is formed of parallel rows of vertical piles of iron or timber, capped by horizontal timbers. These rows of piers, which are erected at right angles to the shore line, are 4 or 5 feet broad, and from 12 to 15 feet apart. To deposit the vessel, the dock is brought up to the staging, and its pontoons passed between the piers. The keel of the vessel passes clear above the middle line blocks on the staging, the outer blocks being temporarily turned down. As soon as the vessel has been brought over the keel blocks on the staging the dock is lowered, the vessel takes her bearing, the bilge blocks are immediately drawn in in the dry, and the dock is withdrawn, ready to raise or lower another vessel. A few feet variation in the level of the water can always be accommodated by the use of more or less blocking, and vessels of any breadth, however great, can be raised and deposited with the utmost facility. The operation of lowering a vessel from the staging into the water is necessarily the exact reverse of that of raising, which has been fully described.

It will be seen that the depositing dock is specially suitable for large commercial ports where many vessels have to be docked, as one dock can serve any number of vessels; the number of vessels that can be accommodated is, in fact, limited only by the length of staging provided. The dock is very economical in its working, and requires much less pumping to be done than an ordinary stone dock. When a vessel is on the staging, it is fully exposed to light and air, and is in an exceptionally favorable position for being painted or repaired. The depositing dock is constructed in two equal portions, each furnished with engines, pumps, etc., complete, so that each portion can be used as an independent dock for smaller vessels; each portion can also at any time be docked on the other portion without any heeling over, so that all parts are readily accessible for cleaning and painting, thus enabling the dock to be kept in the most thorough preservation. The staging can be erected in comparatively shallow water, as it is not necessary to have a much greater depth than the draught of the dock with the vessel on it, say from 10 to 15 feet; but where the vessels are raised or lowered, which can always be done at the same spot, there must be a depth equal to the depth of the pontoons added to the draught of the vessel. Vessels can, with advantage, be built on the staging, and lowered into the water at a very small cost, without any rolling or sliding motion, and without running the risk of straining incurred by launching. The time occupied in docking a vessel of any size need not exceed one hour, and in lowering half an hour; a vessel can, of course, be raised, sighted, and refloated in less than two hours. The following are among the chief advantages of the depositing system: 1. One dock can accommodate any number of vessels by means of staging, which can be erected along the waste shores of a river or wet dock. 2. The dock can take a vessel of any size, and of a breadth too great to enter any other fixed or floating dock. 3. Each half of the dock is complete in itself, and can be used as an independent dock for smaller vessels, and for docking the other half. 4. Each additional length of staging provides the accommodation of an additional graving dock at a very small cost. 5. Vessels can be built on an even keel on the staging, and can be lowered into the water without any strain, avoiding the risk and cost of launching, and saving the space required for a slip. 6. The dock, either with or without a vessel, can be towed from place to place, for the purpose of docking and depositing vessels at different points. 7. The dock cannot sink, even if all its valves be left open by accident or intention. 8. The dock can at any time be enlarged as occasion may require at the same rate per ton as its original cost. 9. With sufficient staging, one of these docks can accommodate a very great number of vessels daily, and can, therefore, earn a very much larger dividend than any other form of dry dock.

We may add that in 1876 Messrs. Clark & Standfield constructed for the Russian government a large depositing dock. The firm have also constructed a depositing dock at Barrow, to dock vessels up to about 3,200 tons displacement, and also another dock for the Russian government, to dock vessels up to about 8,000 tons displacement.—*Iron.*

THE following is a good remedy for burns: Mix 4 ounces of the yolk of eggs with 5 ounces of pure glycerine. This forms a kind of varnish.

Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN. A. E. BEACH.

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NEW YORK, SATURDAY, OCTOBER 3, 1885.

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A NEW PHASE IN THE TELEPHONE LITIGATIONS.

It will be seen from an interesting article, with details, given in our this week's SUPPLEMENT, that a new and peculiar form of attack has been commenced against the Bell Telephone Company, being a suit brought in the name and at the cost of the Government of the United States to break and annul the original Bell patent. One peculiarity of the case is that the Attorney-General, by whose authority the suit is brought, is, or was lately, deeply interested in the stock of a rival telephone company that will shortly be enjoined and probably ruined, unless saved by this new legal dodge. Another curious feature is that, in this new suit, the Attorney-General has appointed as the lawyers to represent the Government the same lot of lawyers who have heretofore defended and been paid by the Attorney-General's telephone company. Thus, by favor of the Department of Justice, the lawyers of the Attorney-General's telephone company will continue to battle for his interests, but will in future draw pay from the Treasury of the United States.

We are among those who regard the Bell patent as an illegal monopoly. We believe the lower court, through some misintrepretation of evidence or failure in its presentation, awarded to Bell a discovery that, in truth and justice, belonged to another man. Phillip Reis, in 1860, was the original and first inventor of the electric telephone; he gave the invention to the public in several forms many years before Bell's device was made; his inventions were known to Bell; and now, at this late day, to have the inventions of Reis wrenched from the people and converted into a vast monopoly for the enrichment of private individuals seems like a mockery of justice.

The manner of its accomplishment is about as follows: In the first suit judge number one, on the meager evidence then presented, concluded Reis' telephone to be good for nothing, and held Bell's patent to be valid. In the second case, judge number two would not hear additional evidence concerning Reis, as the subject had been already decided. In the third case, judge number three declined to hear the evidence for similar reasons. In the fourth case, judge number four reaches the same result; he agrees it would not be polite to the other judges to rule differently. Thus the several judges, although only one investigation of evidence has been made, have ranged themselves like so many fences, one behind the other; and the Bell people, in addition to their patents, practically control the art of transmitting speech to the ears of the judges of the lower courts.

Unsatisfactory as this state of things appears, it is, nevertheless, strictly in accordance with legal forms and precedents, and affords no shadow of justification for the scandalous spectacle which the Department of Justice is now making of itself.

Patentees are interested in this matter without regard to what they may think of this particular patent of Graham Bell. If the United States will lend its wealth and influence to carry on litigation and encourage infringement of a patent sustained by all the circuit courts, and do this upon alleged defenses which have been passed upon, and in favor of those who can avail of them in actually pending suits, but who happen to have special personal relations with the Attorney-General, and do this on *ex parte* presentation of the case, invention and a patent will no longer confer rights, and decisions of the courts can no longer, sustain nor protect them.

STILETTO AND ATALANTA.

It will be remembered that early in July it was announced that the Stiletto had won the race over the ninety mile course from Larchmont to New London. The race was very close, but it was supposed that she had beaten the Atalanta by several minutes. Mr. Gould promptly protested against the decision, on the ground that the Stiletto, probably by mistake, had left the prescribed course, and near the finish had gone inside instead of outside of a certain buoy. A committee was appointed by the American Steam Yacht Club to investigate the charge, and after hearing rather a voluminous testimony on the subject, decided in Mr. Gould's favor, and awarded the challenge cup to the Atalanta.

This decision has called forth a challenge from Mr. Herreshoff for another race between the two steam yachts, over a hundred mile course on the Hudson, from New York fifty miles up river and back again. The proposed stake is a new championship cup, to be held by the winning boat until her record is surpassed. Mr. Gould has intimated his willingness to accept the challenge, if an open water course, such as that on the Sound, over which the disputed race took place in July, be selected instead of the Hudson, as the Atalanta, it is stated, is only allowed to run at three-fourths speed on the river, on account of the numerous craft encountered, and in passing a flotilla of tow boats is obliged to slow down or even to come to a full stop, while the smaller yacht circles around them at full speed. Moreover, the Atalanta, on account of her size, requires fifteen minutes to turn about, while the Stiletto can turn in two. These conditions

would manifestly make a river race in two directions unfair to the Atalanta; and since the disputed race came off on the Sound, the second trial would seem more conclusive if made over the same course.

PNEUMONIA AND OZONE.

Dr. Draper, of the Meteorological Observatory at Central Park, New York city, has called attention to the fact that during the past eight years there has been an apparent connection between the death-rate from pneumonia in New York and the presence of ozone in the atmosphere. The epidemic has been particularly fatal during the present year, and it is stated on good authority that the death-rate from this cause has exceeded that from cholera in 1854. It has not been determined whether the connection between the disease and the ozone in the air is simply a coincidence, or whether there are scientific reasons for their joint appearance.

We know as yet but little about either the cause of the disease or of the modified form of oxygen which we denominate as ozone. In pursuing an investigation to discover their true relation, should any be found, two cases are possible: either that the ozone, which in large quantities we know to be injurious to health, is the direct cause of the disease, or that the same atmospheric conditions which produce ozone are also favorable to the spread of pneumonia. We are inclined to believe that the connection is purely accidental, but of the two hypotheses, the latter seems the more tenable, though Dr. Draper has apparently given it no consideration.

ASPECTS OF THE PLANETS FOR OCTOBER.

SATURN

is morning star. He takes the leading part among his brethren, for a noteworthy epoch occurs in his long journey round the sun. He reaches perihelion, or his nearest point to the sun, on the 21st, at 7 o'clock in the morning. As this event occurs only once in nearly thirty years, it must rank as a high festival in the solar family.

The sun and the member of his family who is second in size, and first in the surpassing beauty of his system, make their nearest approach to each other. It is 29½ years since their last meeting under similar conditions. During that time, Saturn has traveled more than five thousand million miles in making his vast circuit around the sun, and now looks the great luminary in the face from a standpoint 100,000,000 miles nearer than when, fifteen years ago, he passed aphelion or his most distant point from the sun.

Figures give little idea of distances to finite minds when trying to form an idea of the space that intervenes between our planet and one that revolves in an orbit of vast circumference like that of Saturn. The difference even between his least and greatest distance from the sun is greater than the whole distance that separates us from the mighty orb on whom all the planets depend for life and light.

The reason for the varying distance of the planets is easily understood. Each planet moves in an elliptical orbit, the sun being in one of the foci of the ellipse. There must be a point in each orbit where the planet is nearest to the sun, or in perihelion, and also a point where the planet is farthest from the sun, or in aphelion. Saturn illustrates the former condition and Venus the latter during the present month. The ellipticity of the orbit, or the eccentricity, as it is called, varies greatly in the different planets. Mercury has the greatest eccentricity, Mars comes next, and Saturn takes the third place, while Venus has the least, her orbit being nearly circular.

The perihelion of Saturn is an important astronomical event, and has been anticipated for years with eager interest. But why should the nearest approach of this planet to the sun be of so much consequence to terrestrial observers? is a question that naturally arises to thoughtful minds. It is because when Saturn is nearest to the sun, he is, under certain conditions, nearest to the earth, and the approach is easily perceptible in his increased size and greater brilliancy. There are three conditions that, when united, give the best possible views of Saturn. He must be in perihelion, his rings must be open to their widest extent, and he must be in opposition, or Saturn, the earth, and the sun must be in a straight line, with the earth in the middle. These three conditions are nearly united in the present position of our magnificent brother in regard to the earth. He is in perihelion, his rings are open to their widest extent, and he is within two months of opposition, as well as in high northern declination.

Nearly a whole generation will pass away before Saturn will again be seen under conditions as favorable as those he now presents. Instead of a dull, murky, and ill-omened star, he shines with a soft and serene light, that gives him a pre-eminence among the surrounding stars, and brings out the best aspect of the planet that ranks as second in the solar scheme. His proximity increases his size, and his wide open rings give him an elliptical form to eyes blessed with exceptional visual power. It is field day with astronomers, who will eagerly improve the rare occasion in searching for new satellites, in seeking to find out what the rings are made of, and in tracing the shadowy belts on the planet's disk.

No guide will be needed to point out Saturn's position in the heavens. He rises on the 1st, in the northeast, about 10 o'clock, and cannot fail to be recognized by any observer who commands a view of the eastern horizon. He will rise about four minutes earlier every evening until the end of the month, when his beaming face will be visible soon after 8 o'clock. He is still classed among the morning stars, although he rises early in the evening. For according to astronomical law, planets on the western side of the sun rank as morning stars, those on his eastern side rank as evening stars. Saturn will be on the western side until opposition in December.

He is in quadrature with the sun on the 1st, at 1 o'clock in the morning, being 90° west of the sun, and half way between conjunction and opposition. He has been traveling eastward or in direct motion for several months, but is stationary about the time of perihelion.

The right ascension of Saturn on the 1st is 6 h. 15 m.; his declination is 22° 18′ north; his diameter is 17·4″; and he is in the constellation Gemini.

Saturn rises on the 1st about a quarter after 10 o'clock in the evening; on the 31st he rises a quarter after 8 o'clock.

VENUS

is evening star. As we classify the planets in the monthly presentation according to the interesting incidents they supply for observation, Venus easily wins the second place on the October list. She grows more beautiful all the time as she recedes from the sun, while her increasing distance being now plainly perceptible in the longer time she remains above the horizon after his departure. When the month closes, she will set two hours and a quarter after sunset. She will be the gem of the early evening sky in October, wending her shining way in the southwest, and leaving but one regret, that her path is not further north while she takes on her present lovely aspect. She has passed near several first magnitude stars since she became evening star, paying her respects to Regulus in July, Spica in September, and she will be near Antares in October, on the 16th, being 3° north at the time.

Venus is in aphelion on the 16th at 10 o'clock in the evening. Her eccentricity, however, is so small that her orbit is considered circular for all ordinary purposes.

The right ascension of Venus on the 1st is 14 h. 57 m.; her declination is 18° south; her diameter is 15·2″; and she is in the constellation Libra.

Venus sets on the 1st about 7 o'clock in the evening; on the 31st she sets at nearly the same time.

MARS

is morning star. He rises about a half hour after midnight, and varies little in his time of rising during the month. He may be found at the close of the month a little way northeast of Regulus, and is visible as a small red star.

The right ascension of Mars on the 1st is 8 h. 48 m.; his declination is 19° 3′ north; his diameter is 5·4″; and he is in the constellation Cancer.

Mars rises on the 1st about a half hour after midnight; on the 31st he rises a few minutes after midnight.

JUPITER

is morning star. He is too near the sun to be of much consequence at present. But he is making his way rapidly to visibility, and when the month closes, he rises more than three hours before the sun.

He is in conjunction with Beta Virginis on the 21st, at 2 o'clock in the afternoon. Observers will not be much the wiser for this meeting of planet and star, but it takes place just as surely as if it were as plainly visible as the rising of the moon.

The right ascension of Jupiter on the 1st is 11 h. 29 m.; his declination is 4° 26′ north; his diameter is 29·6″; and he is in the constellation Virgo.

Jupiter rises on the 1st a quarter after 4 o'clock in the morning; on the 31st he rises a quarter before 3 o'clock.

MERCURY

is morning star until the 16th, and then evening star. On the 16th, at 5 o'clock in the morning, he is in superior conjunction with the sun, having completed one of his swift circuits from superior conjunction to superior conjunction again in 115 days, his synodic period.

On the 4th, at 8 o'clock in the evening, he is in conjunction with Uranus, being 1° 13′ north.

The right ascension of Mercury on the 1st is 12 h.; his declination is 2° 3′ north; his diameter is 5·2″; and he is in the constellation Virgo.

Mercury rises on the 1st about a quarter before 5 o'clock in the morning; on the 31st he sets at 5 o'clock in the evening.

URANUS

is morning star. He is too near the sun to be of any interest to students of the stars. His monotonous course is, however, enlivened by a meeting with Mercury on the 15th.

The right ascension of Uranus on the 1st is 12 h. 14 m.; his declination is 0° 49′ south; his diameter is 3·4″; and may be found in the constellation Virgo.

Uranus rises on the 1st a quarter after 5 o'clock in the morning; on the 31st he rises at half past 3 o'clock.

NEPTUNE

is morning star.

The right ascension of Neptune is 3 h. 33 m.; his declination is 16° 22′ north; his diameter is 2·6″; and he is in the constellation Taurus.

Neptune rises on the 1st about half past 7 o'clock in the evening; on the 31st he rises about half past 5 o'clock.

THE MOON.

The October moon fulls on the 23d at 4 h. 22 m. P. M. The moon is in conjunction with Saturn on the 1st at 6 h. 9 m. A. M., shortly before the last quarter, being at the time 4° 15′ south. She is in conjunction with Mars on the 3d, at 2 h. 5 m. P. M., being 5° 4′ south. She encounters Jupiter on the 6th, at 11 h. 49 m. A. M., being 1° 25′ south.

There is a very close conjunction or an appulse between the moon and Uranus on the 7th, at 6 h. 56 m. A. M., the moon being only 6′ north of the planet. She is in conjunction with Venus on the 11th, three days after new moon, at 6 h. 39 m. A. M., being 6° 23′ north. On the 25th, at 8 h. 58 m. A. M., she is at her nearest point to Neptune, being 2° 44′ south. She is in conjunction with Saturn a second time on the 28th, at 0 h. 4 m. P. M., being 4° 7′ south, and with Mars on the 31st at 11 h. 7 m. P. M., being 4° 15′ south.

OCTOBER'S

starlit sky presents one prominent subject for observation and study. It is the perihelion of Saturn. The sun and the most richly gifted of his sons are at their closest point of approach, 100,000,000 miles spanning the distance that intervenes between Saturn's perihelion and aphelion. Fortunately the earth approaches that point of her orbit where her path lies almost between the sun and Saturn, and she profits largely by the proximity, for the increased size and clear radiance bear testimony to the nearer neighborhood of the ring-girdled planet. It seems absurd, however, to speak of the nearness of an object whose mean distance from the sun is 881,000,000 miles. We are at sea, without a pilot, in seeking to comprehend dimensions where a million miles is the measuring unit. But we can see results in the beauty and brightness of a planet that fifteen years hence will shine with a dull, murky light in striking contrast with his present serene aspect.

Astronomers who make Saturnian investigation a specialty will improve the present favorable conditions. It will not be unexpected if they find out whether the dark spaces between the rings are merely shadings in or between the myriad satellites that make them up, or even if a ninth moon should be detected faintly gleaming among its brethren.

If twenty-five years exhausts an astronomer's highest power of observation, before Saturn's return to perihelion in 1915 observers who are now in their golden prime will have lost their power to see clearly, observers who are just entering the astronomical field will rejoice in the maturity of visual strength, and observers who are but children now will become aspirants for the laurels the heavens bestow on those who devote their life work to the study of celestial mysteries.

Nearly a generation of those who now tread the earth will sleep peacefully in its bosom, while this wonder of the skies traverses the vast path that forms his circuit round the sun. A generation of men lives and dies in one Saturnian year!

Well may it be said that the study of astronomy promotes humility, teaching, as no other science can, the insignificance of humanity!

What is our earth with her one moon in the material scale by the side of the magnificent Saturn with his rings, moons, and belts? We may, however, find consolation for our littleness in the thought that the earth is in her perfection of development, while the primeval fires of Saturn still burn. When animate life reigns on this peerless planet, the earth, according to the law of inevitable decay, will be a dead world, cooled down to the condition of our satellite, where life and moisture are unknown. Mars and Mercury will perhaps succumb to the same law before the earth, on account of their smaller dimensions, while Venus will keep pace more nearly with her twin sister. The four great planets will then rejoice in physical perfection, and take the place now occupied by their more insignificant brethren. But millions of years will be required to effect these changes, and the inhabitants of this little planet can meanwhile behold the process of world making on the larger planets, and the process of decay on the smaller ones, while they wait patiently for what is to come.

Vulcan Hammers for Sweden.

Wm. P. Duncan & Co., of Bellefonte, Pa., have just shipped an 80 lb. Vulcan power hammer to Sweden, and are constantly receiving orders in this country. This hammer is growing in favor every day.