

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, APRIL 3, 1886.

Contents.

(Illustrated articles are marked with an asterisk.)

Table listing various articles such as 'Accidents from machinery', 'Inventions, miscellaneous', 'Architectural designs, artistic', etc., with corresponding page numbers.

TABLE OF CONTENTS OF SCIENTIFIC AMERICAN SUPPLEMENT No. 585

For the Week Ending April 3, 1886.

Price 10 cents. For sale by all newsdealers.

Table listing contents of the supplement by section: I. CHEMISTRY, II. ENGINEERING, ETC., III. TECHNOLOGY, IV. MAGNETISM AND ELECTRICITY, V. SPECTROSCOPY, SOUND, ETC., VI. ARCHITECTURE, VII. GEOLOGY, VIII. HORTICULTURE, IX. MISCELLANEOUS.

THE PATENT BILLS BEFORE CONGRESS.

A large number of bills are now before Congress, designed to modify the existing patent laws. Regarded as a whole, the most notable point concerning them is their diversity of purpose, which appears to have been determined, more or less, by local prejudice or the degree of popular enlightenment in the district or State whence the bill originated.

To encourage and benefit the inventors there are bills for extending the designs patent law; for extending the trade-mark law; for extending the benefits of the copyright law to foreigners; for preventing the sale of patent rights for debt; for preventing old foreign inventions from being patented here; for reviving and extending all old expired patents, and existing patents, so that a new term of eight years shall be now enjoyed; for extending the jurisdiction of the Circuit Court and facilitating patentees in recovering compensation for the use by Government of their patents; for the grant of patents for new flowers, fruits, horticultural and agricultural improvements; for the appointment of a commission to find out and report what changes are required in the patent laws—cost thereof, twenty-five thousand dollars; for the establishment of a Patent Court in Washington as an adjunct to the Patent Office, with clerks, deputies, bailiffs, etc., at a cost of many thousand dollars; for extending the jurisdiction of the Court of Claims to patent cases.

We have not space at this time to go into the particulars of all these bills, but shall hereafter refer to several of them, as they contain interesting and novel features.

For the present, let us look at Senate bill 1,511, introduced by the Hon. James Z. George, Senator from Mississippi. Its first section, of twelve lines, provides that any person who in good faith shall buy a patented article without notice that the same was covered by a patent, or without notice that the seller had no right to sell such article, shall thereby become the absolute owner, and no subsequent notice that the seller was not the lawful owner shall in any way impair the right of such purchaser as absolute owner.

If this bill is enacted into law, a man who buys stolen property—a patented wagon, for example—will become the absolute owner, the bona-fide proprietor will be debarred from recovering his property, and the lawful patentee will be done out of his royalty fee. It is not often that three such glaring outrages on justice are packed within so brief a legislative proposition. The bill perhaps represents the Mississippian idea on patents, but it is not very encouraging to honest industry and invention.

The second section of the same bill provides that all patents hereafter granted shall be subject to purchase by Congress, for the use of the people of the United States, at such reasonable valuation and terms as may be provided for by law.

This section seems superfluous in view of the first section; besides, Congress may at any time authorize the purchase of patents, and has frequently done so.

House bill 5,925, introduced by the Hon. Charles B. Lore, of Delaware, is intended to repeal all the present patent laws and establish another system of rewards for inventors. It provides that a patent shall be granted for one year only; the patent shall be submitted by the Commissioner of Patents to a committee of experts, who shall decide, finally, whether the invention is valuable or not. If found of no value, the inventor gets nothing, and goes to grass. If the Expert Committee find the invention of worth, they decide upon the cash value of the invention, which shall in no case exceed two hundred thousand dollars, and from that sum down, to be paid out of the Treasury by warrant of the Commissioner of Patents, the award to be final.

The Expert Committee would have a very delicate duty to perform in fixing the cash valuations, and they would constantly be subjected to risks and probabilities of making egregious errors. For instance, if they were to allow \$10,000 as the value of the patent for the thread placed in the crease of an envelope to facilitate opening of the same, how much ought they to allow for the second patent, that was granted for the little knot that was tied on the end of the thread, so the finger nail could easily hold the thread? Then, again, how much ought the committee allow for

a simple device like the patent umbrella thimble slide, a single bit of brass tubing that costs a cent and a quarter to make? Probably the committee would think that one thousand dollars would be a most generous allowance, while two hundred thousand dollars—the limit of the bill—would, of course, be regarded as a monstrous and dishonest valuation. But the real truth is, the patent for this device is actually worth nearer one million dollars than two hundred thousand. The inventor, Dr. John J. Higgins, of this city, has already received over one hundred thousand dollars cash in royalties for his patents, and probably will receive three times that sum before they expire; while his licensees, the umbrella makers, are supposed to have already realized a million dollars' profits directly or indirectly arising from the control of this little article. Few people have an idea of the extent of the umbrella trade. In this city alone there is scarcely an umbrella manufacturing concern of any account that turns out less than two thousand umbrellas per diem.

We have not space to consider the valuations which other and greater inventions should probably receive, such as the harvester, the sewing machine, the printing press, the telegraph. The limit of compensation fixed by the bill would be far inadequate for such improvements.

As a means of getting rid of the surplus income of the Government, the bill in question is admirable. It beats the pension schemes, river and harbor steals, the land grabs, and Congressional private secretaryships all out. But the bill, as it stands, is full of difficulties, and likely to give rise to endless disputes and tergiversations, to overcome which and satisfy everybody, we advise Mr. Lore to amend his little bill as follows: First, grant patents and copyrights, free of charge, to all applicants; and second, the holder of any patent or copyright, on presenting to the Patent Commissioner a full assignment thereof, shall receive five thousand silver dollars, redeemable in gold.

ROOTS' BLOWING AND PUMPING MACHINERY.

A notable example of the world-wide appreciation of good machinery is seen in the remarkable progress made by P. H. & F. M. Roots, of Connersville, Ind., in the manufacture and development of their blowing and pumping devices. These machines now have an international reputation. They are in operation in every part of the globe, and are generally recognized by engineers as standards of mechanical excellence in the lines to which they belong. Some idea of the high esteem in which these machines are held in England will be gained from the recent illustrated article published in the Engineer, which we give in another column.

How Coal Made the "Bad Lands."

The "Bad Lands" of Dakota are said to owe their origin to the burning of the coal deposits that once existed there. They are situated principally along the Cheyenne and Grand rivers and the Little Missouri. They are from two or three miles to, say, twenty-five miles in width. In the long ago, the valleys of these streams must have been filled with drift wood. Then followed a period of drift, which buried the accumulation of wood under two or three hundred feet of sediment, sand, and gravel. The buried wood in time became coal, the veins being in some instances twenty odd feet in depth. Either from spontaneous combustion or from electricity, fires were started in these veins, and they gradually burned out, restoring in part the old water courses by means of the overflow from the accumulation of water in these newly formed basins. Looking upon them, here you see patches of slag, there great boulders, showing unmistakable evidences of great heat, and on every hand scoria or burned clay, resembling broken brick. Where the fires were checked by the caving earth and the coal did not burn, mounds two or three hundred feet in height stand.

And according to the Black Diamond, a newspaper devoted to the coal interests, published in Chicago, in parts of Wyoming the same process is now going on; vast fields are undermined by subterranean fires, and the blackened, smoking plain is filled with desolation. Trappers say these fires have been in existence for a long time, and the traditions of the Indians point to the same conclusion.

Lack of Heat.

In the Superior Court of Massachusetts, in an action for rent against the tenant of rooms in an apartment house, it appeared that the steam heat which the landlord agreed to supply was inadequate; that additional heat became essential to a proper enjoyment of the premises; that the flues and chimneys were defective, or improperly constructed; that her apartments were often filled with dense smoke; and that the elevator service was inefficient. The court held that these grievances were an obstruction to the beneficial enjoyment of the premises, constituting a constructive eviction, and justified the tenant's abandonment.

French Torpedo Experiments.

The Temps, of Paris, gives an account of a series of torpedo experiments which have been lately carried out under the direction of the French Minister of Marine, and which, according to that paper, proved far more successful than those performed by the British fleet in Bantry Bay. It would appear that the new minister, Admiral Aube, is desirous of investigating the efficiency of the torpedo service; and with that object he dispatched a number of boats from Cherbourg to Toulon via the Straits of Gibraltar, to test their sea-going qualities. The trial was most satisfactory, with one exception; the vessels proved very seaworthy, and passed through the Bay of Biscay successfully. But the crews found their quarters most unpleasant; the continual vibration, the cramped accommodation, the want of fresh air, and the general discomfort were such that after thirty-six hours the men were completely fatigued, and needed to run to port for rest. Hence it seemed proved that such boats were only fitted for operations near their base, and could not besent on long independent cruises. But when the firing experiments were made, the results were altogether successful. On the 2d of March an attack was made on the ironclad Amiral Duperre, off the Hyeres Islands, under several different conditions. Two torpedo boats, Nos. 58 and 59, were moored by three cables, while the vessel steamed past them at the rate of 14 to 14 1/2 knots per hour. They launched six torpedoes at her at different angles, some directed at the mast, and others at various parts of the ship. All these missiles struck the vessel and exploded their fuses. The next experiment consisted in boat No. 58 meeting the ironclad stem on, the former at the rate of nine knots and the latter at 14 1/2. When a distance of 500 yards separated the two, the torpedo was ejected from its tube, and struck the ship, 11 meters behind the spur, exploding its mimic charge. Two first-class boats, Nos. 63 and 64, were then brought into action. The former advanced toward the bows of the Amiral Duperre at the rate of 12 knots, the large vessel steaming at the same time at 14 knots. The missile again struck, and when the second boat executed a similar maneuver, its projectile only missed by a few yards.

As far as they go, these trials are most satisfactory, and confirm the opinion that the torpedo boat will be the prominent feature in the naval battles of the future. But, says Engineering, when our contemporary goes on to suggest that the poorer results obtained in Bantry Bay were owing to the English torpedoes being badly equipped or unskillfully worked, he shows that he fails to appreciate the different conditions of the two cases. He might as well compare the shooting at Wimbledon with the waste of lead in a battle. In the placid waters of the Mediterranean, the torpedo had every advantage; in the first trial, the boats were securely moored, and in the others the speeds were evidently settled beforehand. The whole programme was arranged, and was carried out without hurry or excitement.

But in Bantry Bay there was no indulgence extended to the torpedo. The course of the Polyphemus was not known; she was to make a rush at the boom, but could choose her own direction and speed, so that the officers in charge of the boats had to be on the alert to select the most fitting opportunity, and had at the same time to determine what allowance must be made for speed. No wonder the theory that the wave which preceded the vessel deflected the missiles was advanced, and received great prominence in the newspaper accounts which appeared, a theory which our contemporary declares to be now exploded. If the French Minister of Marine will repeat his experiments under conditions more nearly resembling a battle, he will probably find some new hypothesis advanced to explain the poorer results which will be obtained.

A Magnesium Lamp.

A simple method of producing a powerful magnesium light for experimental purposes is described by a correspondent of the Photographic News. It consists of a methylated spirit lamp, the wick of which projects out from the side, near the top, being inclosed in a short spout. The flame of this lamp is made to play upon the bottom of a brass vessel, about the size of an egg-cup, which is intended to contain a mixture of sand and powdered magnesium. There is a small perforation in the bottom of the cup for the continuous escape of the powder, which must be so placed that while it falls into the flame of the spirit lamp, it does not drop upon the wick. The sand-cup arrangement is, in fact, on the hour glass principle. It is essential that the perforated end of the sand-cup should be kept hot by the flame, in order to prevent condensation upon it of water, to which the powder would adhere. A trial will show the required dimensions of the hole in the cup, the proportion of magnesium, and the management of the little apparatus. It is stated, in order to discourage attempts with a very obvious makeshift, that a funnel will not answer in place of the prescribed brass cup, because the neck would

NIGHT SKY—MARCH AND APRIL.

BY RICHARD A. PROCTOR.

The Great Bear (Ursa Major) is now nearing the point overhead, the Pointers (alpha and beta) aiming almost directly downward toward the Pole Star. The line from this star (alpha of the Little Bear, Ursa Minor) to the Guardians (beta and gamma) is now in the position of the minute hand of a clock about 13 min. after an hour.

Cepheus lies north, low down, Cassiopeia on his left, the Cameleopard above her, Andromeda just setting, almost due northwest, on the left. Perseus is due northwest, rather low, the Charioteer (Auriga) on his left, but higher. Setting between west and northwest we see the Bull (Taurus), with the Pleiades and the ruddy Aldebaran. Orion is almost prone in his descent toward his western grave. The Twins (Gemini) are due west, in the mid-heavens; the Little Dog (Canis Minor) beside them on their left, the Crab (Cancer) above, the Greater Dog (Canis Major) below, chasing the Hare (Lepus) below the horizon. Just behind the Dog the poop of the Great Ship (Argo) is also setting.

The Sea Serpent (Hydra) now shows his full length, rearing his head high in the south. Observe the darkness of the region around his heart, alpha, Alfard, the Solitary One. The Cup (Crater) and Crow (Corvus) stand on his back.

The Sickle in the Lion (Leo) now stands with handle upright, due south. Below the tail stars of the Lion we see the Virgin (Virgo), with the bright Spica Azimech. The set of five third magnitude stars above was called by the Arabs, for reasons not explained, the "Retreat of the Howling She Dogs."

Behind the Lion, due east and high up, we see Coma Berenices, the hair of Queen Berenice, between which and the tail of the Great Bear we see in the chart one star only of the Hunting Dogs (Canes Venatici).

The Herdsman (Bootes), still on his back, pursues in that striking and effective position the Great Bear. Below the shoulder stars of the Herdsman we see the Crown (Corona Borealis), near which, on the right, low down and due east, the head of the Serpent (Serpens) is rising. Hercules is also rising, but in the northeast.

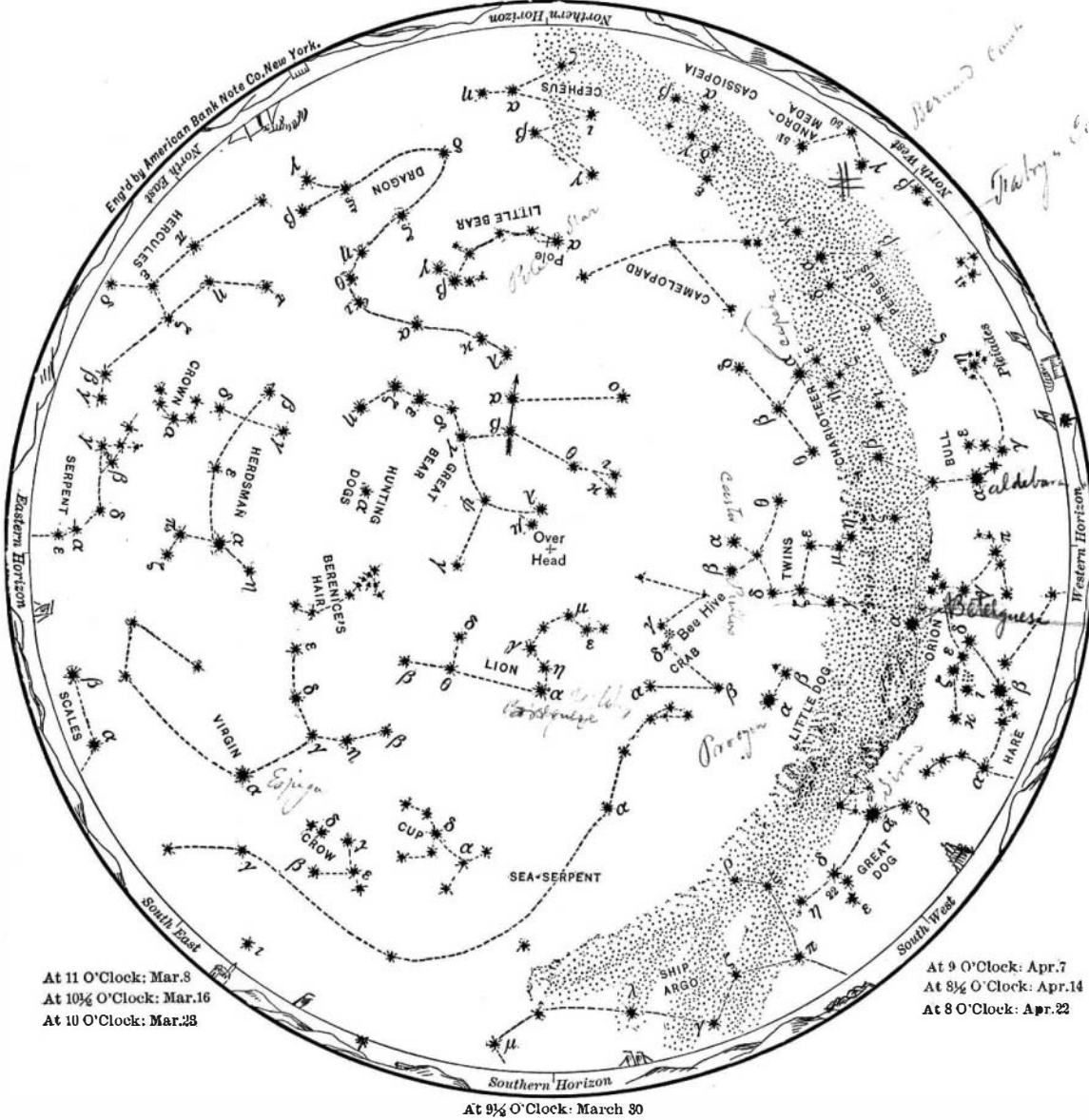
Lastly, the stars of the Dragon (Draco) can be seen curving from between the Pointers and the Pole, round the Little Bear, then back toward Hercules, the head of the Dragon, with alpha, the bright eyes, beta and gamma, being rather low down, and somewhat north of northeast.

Hints to Draughtsmen.

Draughtsmen, as well as others, have their little kinks, and the publishing of these kinks often helps others. A practical draughtsman in Wood and Iron gives the following simple suggestions, which will likely prove useful to some reader. In mixing up inks, the process is very much expedited by heating the dish and water in which it is mixed before commencing. It often happens in the summer that the flies walk over a tracing and eat off the ink in a very provoking manner. The use of vinegar instead of water will prevent this. In making a tracing, the cloth will take the ink much better if it is rubbed over with chalk. Tracing cloth that has been rolled up may be straightened out effectually and expeditiously by drawing it over the edge of a table or drawing board, holding it down meantime with an ordinary three-cornered scale. When there are a large number of drawings made and kept, a great deal of trouble and confusion can be avoided by making all the drawings on extra standard sizes. If a size of 16 x 24 in. be adopted, then the next larger size would be equal to two of these, or 24 x 32 in. This enlarging or reducing process may be carried as far as the circumstances require, but it is always best to do it by the doubling or halving process if possible.

One of the advantages of standard sizes of drawings is that they may be kept in a case of drawers, the size of which is made to accommodate the standard sizes determined upon.

NIGHT SKY: MARCH & APRIL.



At 11 O'Clock: Mar. 8  
At 10 1/2 O'Clock: Mar. 16  
At 10 O'Clock: Mar. 23

At 9 O'Clock: Apr. 7  
At 8 1/2 O'Clock: Apr. 14  
At 8 O'Clock: Apr. 22

In the map, stars of the first magnitude are eight-pointed; second magnitude, six-pointed; third magnitude, five-pointed; fourth magnitude (a few), four-pointed; fifth magnitude (very few), three-pointed; counting the points only as shown in the solid outline, without the intermediate lines signifying star rays.

Railroad Tie Plantations.

Hon. R. W. Phipps, Forestry Commissioner of Ontario, in a letter from Southern Kansas to the Toronto Globe writes:

"One railroad board here, knowing that the growing of wood, when set about in earnest, is neither a slow nor difficult task, has established in Kansas the largest artificial plantation of forest trees in North America. These railway gentlemen themselves gave out the contract for planting over a square mile of land with young saplings of the catalpa and ailantus; and their president, observing the success of their experiment, and impressed with its probable excellent financial results, has had planted at his own expense, as a speculation, as much more. These are situated near the little town of Farlington, Kan."