north than Venus. Mars rises on the 31st at 5h. 16m. A.M., and sets at 7h. 31m. P. M.; it cannot at that time be seen

#### Jupiter.

On July 1, Jupiter rises at 3h. 45m. P. M., and sets at 1h. 35m. the next morning. On July 31, Jupiter rises at 1h. 47m. A. M., and sets at 11h. 35m. P. M.

Jupiter is so well situated in the first half of the month that observers who have small telescopes(say with two inch object glasses) can very well observe the many changes in the relative positions of its four moons. As the first satellite, or the one nearest to Jupiter, makes a revolution around the p'anet in less than ten days, it goes through all the changes, passing from east to west behind the planet, and in front of the planet from west to east (as seen in a telescope), becoming invisible by transit, by occultation, and by eclipse in that space of time. This satellite will show these changes of position between 7h. 30m. P. M., and midnight on July 7, 8, 9, 14, 15, 16, 22, 23, 24, 30, and 31,

On July 10 the third satellite (which is the largest, but third in the order of distance) will not be seen until near 10 P. M. (Washington time), being in front of the planet; on the 28th it will disappear at 10h. 14m. by going into the shadow of the planet. Young observers may learn much of this system of bodies by watching their movements, and may determine periods for themselves.

#### Saturn.

On July 1, Saturn rises at 10h. 35m. P. M., and sets at 9h. 21m. the next morning. On July 31, Saturn rises at 8h. 34m. P. M., and sets at 7h. 16m. next morning.

Saturn can be recognized on July 10 by its nearness to the moon: and by reference to the American Nautical Almanac it will be found that the moon occults (hides by seeming to pass over it) the planet Saturn on August 6, and again on September 2.

#### Uranus.

Uranus is too nearly in range with the sun to be seen. It sets at 9h. 41m. P. M., on July 1, and at 7h. 48m. P. M. on

#### Sun Spots.

We are evidently passing through a minimum period of sun spots; as from May 26 to the present date, June 19, a period of 23 days, with a telescope whose object glass measures two and a half inches, no spots have been found.

### NEW BOOKS AND PUBLICATIONS.

TROW'S NEW YORK CITY DIRECTORY, VOL. XC., forthe year ending May 1, 1977. H. Wilson, Compiler. Price \$5. New York city The Trow City Directory Company, 11 University Place.

WILSON'S BUSINESS DIRECTORY, 1876-7. Price \$2.50. New York city: The Trow City Directory Company, 11 University Place. The peculiarity which distinguishes directorics from other books is that everybody wants to consult them, yet few wish to buy them. In fact, there seems to be a kind of popular idea that directories are only magnified sign posts, to be used as freely as the signs on the street corners. This is one disadvantage with which directory publishers are obliged to contend, and which prevents the care and elaboration with which their onerous tasks are performed from being recompensed as highly as they merit. The two volumes above named are the oldest and best known works of their class and possess a degree of accuracy which none other in this, or any other city, to our knowledge, possesses. In the city directory, there are 241,167 names, and there are seven items (business, number, etc.) to each name yet we are told there is but one error to every 8,400 items. The number of names above given shows an increase over last year of 7.196, and also prove that the population of New York is steadily growing, notwithstanding the assertion to the contrary by some despondent croakers. Allowing that each name represents five persons—for generally it is only the name of the head of the family that is given—the increase since last year is 35,980 souls. Not only for the counting room and business man is a directory useful, but in the household such a book of reference is very convenient.

THEORY OF SIMULTANEOUS IGNITIONS. By Brevet Brigadier General H. L. Abbot, Major U. S. Engineers. Printed on the Bat-

This is a treatise on the best method of securing the simultaneous ignition of many fuses distributed throughout the charge of one long mine. The theory is mathematically demonstrated at length, and a portable machine, requiring only about four horse power, is described, which will supply an magneto-electric current ample to meet nearly any demand in submarine blasting on the most extensive scale. The paper has already been referred ese columns, in our abstract of essays read at the last session of the American Academy of Sciences.

POCKET BOOK OF USEFUL FORMULÆ AND MEMORANDA FOR CIVIL AND MECHANICAL ENGINEERS. By Guilford L. Molesworth New York city: E. & F. N. Spon, 446 Broome street.

This is the eighteenth edition of the most convenient engineer's pocket book extant. It differs from the works of Haswell and Nystrom in contain ing very much less information; but its contents embody just those useful suggestions and formulæ with which every engineer fills up the leaves of his private note book. It is of the right size, and contains just the facts which will be convenient to the engineer when called to examine machinery, and to make rough calculations; and not knowing exactly what

A TREATISE ON UNITED STATES PATENTS. Edited by H. & C. How son. Philadelphia, Pa.: Porter & Coates.

This is a neatly bound book of 160 pages, and contains more information of value to patentees than any work of its size that has come to our knowledge. It not only defines the nature and scope of patents, but it states what constitutes an invention, and tells the reader to whom patents are granted, how an acquired interest may be lost, etc. But the most important feature of the book is its citations in brief from decisions in the United States Supreme Court on important and peculiar cases, which gives the book a considerable value to the owners and workers of patents, as such information cannot be had except by laborious search through elaborate law

HINTS TO YOUNG ENGINEERS UPON ENTERING THE PROFESSION. By Joseph W. Wilson, A. I. C. E. New York city: E. & F. N. Spon, 446 Broome street.

The author, in this little pamphlet of 22 duodecimo pages, has combined a good many sound practical hints, and plenty of just the advice which an engineering student requires at the threshold of his profession. It is written in a pleasant half amusing style, does not about in moral reflections, and, altogether, is an agreeable and sensible little work. More of the same kind would be welcomed by students in other professions and trades.

OUR ROADWAYS. By "Viator." New York city: E. & F. N. Spon,

Authors was append anonymous names to their productions can hardly

expect much deference paid to their opinions. The present pamphlet has some useful information on pavements in general, but appears to be strongly devoted to the interests of an English wood-paving concern.

THE CLERK OF WORKS' VADE MECUM. By George Gordon Hoskins, F. R. I. B. A. New York city: E. & F. N. Spon, 446 Broome Street.

A useful volume of practical suggestions for the architect charged with the supervision of a building. It is of course mainly in accordance with English practice and customs, which detract from its practical usefulness to our architects; but it possesses hints which maybe found of interest and some benefit.

#### DECISIONS OF THE COURTS.

#### United States Circuit Court-Eastern District of New York.

THE PATENT DRIVE WELL. -WILLIAM D. ANDREWS et al. vs. Theodore A. CARMAN.

| In Equity.—Before Benedict, J.:—Decided April 24, 1876.]

in Equity.—Before Benedict, J.:—Decided April 24, 1876.]

This is a suit in equity brought by the owners of a patent issued to Nelson W. Green, on May 9, 1871, designated as reissue No. 4,372, against Theodore A. Carman for an injunction and damages, because of an infringement of their patent.

The language of the claim may be first considered. It is as follows:

"What I claim as my invention, and desire to secure by letters patent, is: The process of constructing wells by driving or forcing an instrument into the ground until it is projected into the water, without removing the earth unward, as it is in boring, substantially as herein described.

I understand this patent to be a patent for a process, and that the element of novelty in this process consists in the driving of a tube tightly into the earth, without removing the earth upward, to serve as a well pit, and attaching thereto a pump, which process puts to mractical use the new principle of forcing the water in the water-bearing strata of the earthinto a well pit, by the use of artificial power applied to create a vacuum in the manfier described.

A somewhat different reading of the patent may be adopted, and supported by authority high in this court upon such a question.

But the view I have expressed is so firmly impressed upon my mind that I shall rest my decision upon it, and leave the more learned judges before whom the patent must shortly come to detect my error, and to uphold of destroy the patent as being for a method of sinking a well pit by puncturing instead of excavaring.

The interpretation I have thus given to the patent renders it unnecessary to passupon the evidence in the case, given to show that, prior to the time when Green the man entitled to secure the invention, which his patent de-

The interpretation I have thus given to the patent renders it unnecessary to pass upon the evidence in the case, given to show that, prior to the time when Green claims to have made his invention, well pite had been made by puncturing the earth.

Was Green the man entitled to secure the invention which his patent describes? The evidence is convincing that Green first conceived the idea, explained his idea to others, and caused the feasibility of his process to be tested by actual experiment. Comment has been made upon the fact that the particular tools and devices used in constructing the first wells made were not rointed out by Green. But such comment loses its force when it is considered that the tools and devices employed in sinking the shaft form no part of the invention claimed by Green.

The invention consists in the method of nutting toa practical use the new idea or principle of increasing the productive capacity of a well by forcing water directly from the earth into the well pit, artificial power being employed to create, by the operation of a pump attached to a tube driven tightly into the earth, a vacuum inthe tube and the water-bearing stratum into which it is projected, whence follows an increased pressure upon the water in the earth toward the well pit, and an abundant supply of wateris afforded to the pump. This conception was of such a character that when described there was left nothing to be done but to test its correct. Sure an experiment so simple, and involving the means in such common use that it could be tested by any one upon the mere statement of the idea. In the present instance the brocess was at the outset put to the test of an experiment conducted near Green's house, in his presence, and under his directions. His idea, and his process of nutting it into practical use, then became part of the property of the public, available for the purposes intended, unless the secured by the patent in question.

Subsequent experiment might, therefore, and under his directions of the vacuum suffic

or tests applied to the interfor, these points of doubt. A wine range of subsequent experiment ingligh, therefore, well he allowed for such an invention, notwith sanding the directionation between the inventor, or Byron Mudge, the person who, under the direction of Green, conducted the carly experiments; and a batent issued to Mudge, October 24, 1865. Is set up in the answer. The defendant does not, however, claim under Mudge's batent, or under any natent. In fact, there is no natent to Mudge, as his original natent was surrendered; and upon his application for a relissue, a case of interference between him and Green was declared, which, after a severe contest unon a large amount of testimony, and after careful argument, was decided in favor of Green. No patent to Mudge is therefore in this case, nor is Mudge called as a winess.

But the defendant contends, as he may rightfully do, that the evidence shows Mudge to be the Inventor, and not Green. I cannot find upon the evidence that this defense is austained; on the contrary, it appears quite clearly an atent to James Succret is also set un. That, however, is not a patent for a process, but a combination which does not involve the use of Green's process, and to which Green makes no claim.

The whole question of prioruse may at this place be disnosed of. It is, or course, true that, prior to Green's invention, water had been primped from a hole in the ground, and from a small hole. Doubtless, it is also true that, in some such case, where a numn had been inserted in a small hole, for the purpose of raising thereform in water found therein, the principle of Green's invention of its excisence, and no knowledge of a method of its emboryment is fast that patent and a patent would not therefore the first make it was labeled into operation. No such case is here proved; our first such labeled to man.

As hearing upon the question whether the idea claimed to have been conceived by Green's invention of him who first discovers the principle, and is protein on the late of t

HISTORY OF THE DRIVE WELL AND ITSINVENTOR.

The law nertinent to this branch of the inquirvis the law in force prior to January, 1882. By the patent act of 1876, as well as by the Revised Statutes, all rights previously acquired were preserved. The law governing here is to be found, therefore, in the acts of 1835 and of 1839, as those statutes have been interpreted and smalled by the courts. The facts relied unon as showing a dedication of his invention by Green are that he permitted a well made by his process at the fair grounds in Cortiand, where the Seventsixth New York Regiment, of which he was colonel, was then stationed, to be there publicly used, and that he arranged for providing these to be taken with his regiment when it should move, in order to supply the when in hostic localities. That these facts do not amount to a dedication, I think is main. The occasion which called forth this invention was the remore that the rebels were intending to noison the wells in places where the Union army might come, and the report that some nart of the Union army had been compelled to surrender for the want of water. There was amposed to be a necessity for some form of well that would he tight, to prevent the possibility of noison, and that could he constructed unickly, cheanly, and easily, so as to be available for a moving army. Under the pressure of this supposed necessity, for core conceived the idea of his well, and also devised the method by which that idea could he nut to practical use. Once conceived, a very simple experiment would test the soundness of the positionhe had taken and maintained, in discussions had respecting his and the proventing a warm therein by a pump strached.

This experiment, as the evidence shows, was made under the direction of Green, and in pursuance of the directions he had given, at agrees and thought of the content of the content of the content of the content of the order of the content of the HISTORY OF THE DRIVE WELL AND ITS INVENTOR.

warming the driven rightly into the earth for a well pix, and creating a variant therein by a pump attached.

This experiment, as the evidence shows, was made under the direction of Green, and in pursuance of the directions he had given, at armear his house in Courtiand. The first experiment was a success in this, that it proved the possibility of obtaining a supply of water by this process; but of course it could not prove that a tube could be driven down to a water-hearing stratum in all localities with the cheapness and dispatch necessary to render the process one of general utility. It was natural, therefore, to suppose that, before the process could be declared to be satisfactory, other experiments in other and different localities should be made. He could, be last on the should first the heel of the latter over the heelof the lest, by use his 'nvertian for this bir nose and permit it to be used for two years without forfeiting his right to a patent.

Under such circumstances, it would be going far to say that his act of ermitting the use of his process at the camp in Cortland, where his regi-

Under such circumstances, it would be going far to say that his act of permitting the use of his process at the camp in Cortland, where his regiment was then in camp, and of providing materials wherewith the construction will be such a such as a

Fish. Pat. Cas., 301, Chinera, 3, 1 is in other stream was a considered to the benefit of the doubtraised by his own oath, and the testimony of the two Hunters.

Again, it is contended that the acknowledged fact that Green made no application for a patentifil January, 1866, between four and five years after the date of his invention, shows an abandonment of the invention. But, says Woodruff, J., "lapse of time does not, per se, constitute abandonment. It may be a circumstance to be considered. The circumstances of the case, other than mere lapse of time, almost always give complexion to delay and either excuse it or give it conclusive effect. The statute has made contemporaneous public use, with the knowledge and allowance of the inventor, a bar when it exceeds two years, but in the absence of that and of any other colorable circumstances we know of no mere period of time which ought, per se, to deprive an inventor of his patent." (Russell and Erwin vs. Mallory, 5 Fish. Pat. Cas., 641.)

In the present instance the circumstances attending the delay are unusual; and as I consider them sufficient to excuse a delay which certainly must be deemed extraordinary, a statement of these circumstances seems necessary.

In the present instance the circuinsta ces attending the delay are unusual; and as I consider them sufficient to excuse a delay which certainly inust be deemed extraordinary, a statement of these circumstances seems necessary.

I premise the statement by repeating that upon the evidence there is no room to doubt the fact that Green at the time of his invention claimed to have made a valuable discovery, and to have invented a new process. Furthermore, that he then declared an intention to secure his process by patent, and expressed his belief that large profits would accrue to him ficrefrom. At that time, Green, who had been partly educated at West Point, was engaged in organizing a regiment at Cortland, his residence, and was expecting soon to take part in the war of the rebellion. Within a few days after his invention, in the discharge of what seemed to him to be his duty, he felt compelled to shoot one of the captains of his regiment named McNett. The shot was not mortal but inflicted serious in jury. In the then state of the pupilic mind this occasion gave rise to intense public excitement, out of which sprang a controversy of extraordinary bitterness, involving numerous persons and continuing several years. The effect upon Green was disastrous in the extreme. He was suspended from his command, then tried by a court of inquiry at Albany, and reinstated in command. His regiment, after having, it is said, required the protection of a battery to save it from violence at the hands of evil—disposed people of the county, removed to Washington, where Green was relieved from his command, and then dismissed the service, and subjected to military charges.

He was, in addition, harassed by civil suits brought to charge him with personal liability for articles used by his regiment. He was also arrested, and then indicted for the shooting of McNett, and after repeated purposed. During this period he also became involved in hitigation with the pastor of the civil of his positive of his booting, of McNett, and after repeat

his invention by patent, and serve to furnish a proper excuse for such omission.

In regard to aman so circumstanced, it would hardly be safe, in face of his positive oath to the contrary, to infer an intention to shandon an invention which evidently he always considered of great importance. This conclusion is strengthened by the uncontroverted fact that when in November, 1885, Green saw by an advertiseme t in the paper that driven wells were being put down, athough be was advised by counsel defending him on the indictment, not to apply for a patent, as he would therefly increase the number of his enemies, and prejudice him on the trial of the indictment then about to come on, nevertheless he did then, and in opposition to the advice of his counsel, file his application and assert his right to the invention. I co clude, therefore, that, upon the facts of this case, it must be held that the defendant has not produced that full measure of actual proof which is necessary to sustain the defense of abandonment.

As to the question of infringement, 1 do not understand that it is disputed; at any rate, it is clearly proved. There must therefore be a decree for the complainant in accordance with the prayer of the bill.

George Gifford, Milo Goodrich. B. F. Tracy, and J. C. Clayton, for complainants.

omplainants. W. D. Shipman, S. L. Warner, and S. A. Robinson, for defendant.] ---

#### United States Circuit Court--- District of Massachusetts.

Patent sheep-shearing machine.—William Earle, Jr., et al vs. Charles F. HARLOW et al.

[In Equity.—Before Shepley, J.—Decided October term, 1875, to wit:

The question presented in this ease is mainly one of infringement. The complainants are the owners of the patent reissued to them as assignees of adoniram I. Fullam, December 28, 1878, for a new and useful improvement indevices for shearing sheep. \*

In a sheep-sherring device where power is employed to operate the cutters, it is immaterial what kind of power is employed when the two separate devices are operated in the same way to produce substantially the same effect.

ters, it is limitated as the same way to produce substantially the same exfect.

The patent of Fullam, December 28, 1878, is not limited to an engine operated by the expansive force of steam, by any fair construction of the specification or claims. In this patent, as well as in the Hamilton and Harlow patent of September 1, 1864 (employed by defendants), a power is generated at a source of supply at a desired point, and is transmitted through a flexible tube, so as to be available to actuate an engine in the portatile handle, which converts that power at any other point at the will of the operator.

Decree for complainant.

[Georye E. Betton, for complainants.

James E. Maynadier, for defendant.]

## Recent American and Loreign Latents.

# NEW CHEMICAL AND MISCELLANEOUS INVENTIONS.

IMPROVED DOLL HEAD,

Carl Wiegand, New York city.—This consists of a doll head that is molded of sections made of interior layers of paper or pasteboard and outer layers of muslin, that are joined by a paste of suitable consistence.

### IMPROVED PAINTERS' SCAFFOLD CHAIR

John R. Crockett, Flatonia, Tex.—The invention consists of a scaffold made in the shape of a chair, with mechanism to raise and lower by a suspension rope that is carried over suitable friction pulleys of the chair frame.

### IMPROVED BEAM SCALE.

Jacob J. Hopper, New York city.—This is an improved beam cale for weigh masters, ice wagons, and other purposes, by which the weight is not required to be placed upon and detached from the beam for each weighing. It consists of a beam scale, in which the beam is made of U shape, with the suspension fulcrum at the upper shorter leg, the weight being hung below the fulcrum and sliding along the lower extended leg.

Robert Taylor, New York city.—This consists of an oblique joint in the last at the shank and under the instep piece, so contrived that the heel can be detached from the ball portion and taken out readily. The last can thus be removed from the shoe without stretching the heel of the latter over the heel of the leet, by which