NOTES OF PATENT OFFICE DECISIONS.

A motion was made by Hardy to renew a forfeited application more than two years after the date of allowance of the original application. Such a case falls under the requirements of section 4897 of the revised statutes, which provides that where an applicant fails to make payment of his final fee within six months from the date upon which the application was passed and allowed, and notice thereof was sent to the applicant, or his agent, he shall have the right to make an application for a patent within two years after the allowance of the original application.

The origin of this section dates as far back as 1863. In the Annual Report of the Commissioner of Patents for 1861, it was represented that the Patent Office was suffering disadvantageously by the postponement of the payment of a great many final fees, and Congress, presumably acting on such representation, passed an act (March 3, 1863) containing a provision that if the final fee for a patent was not paid within six months thereafter, the patent should be withheld, "and the invention therein described should become public property as against the applicant therefor." This act was amended by the act of June 25, 1864, which extended the privilege of renewing the patent within six months to any person having an interest in the invention, whether as an inventor or assignee. The act of 1863 was again specially amended by the act of March, 1865, which for the first time extended the privilege of renewing the application to two years after the date of the allowance of the original application, and the language of the section of that act relating to this matter was incorporated without change into the act of 1870. But in the act of 1870, that provision of the act of 1863, in force until 1870, enacting that the invention, as against the applicant, should become public property, was omitted.

The cases under this section 4897 must be distinguished from the abandoned applications covered by section 4894. This latter section requires that the applications shall be completed and prepared for examination within two years after the filing of the application, or, in default or failure of the applicant to prosecute the same, the application is to be regarded as abandoned, unless it be shown to the satisfaction of the Commissioner that such delay was unavoidable. This requirement compelling applicants to prosecute their applications within two years, or else to show to the satisfaction of the Commissioner that such delay was unavoidable, was enacted in March 2, 1861, two years prior to the act of 1863, and was in force cotemporaneously therewith until 1870.

There is an injustice apparently resulting from this discrimination which the law makes between the applications which have not been prosecuted within two years after an action by the Patent Office and applications which have been prosecuted with diligence and passed to issue. In the former case, the applicant may keep his case alive for a number of years; or, after the application has become abandoned by operation of law, he may renew it by showing that his delay was unavoidable; or he may discard the old application altogether and file a new one in its place; whereas the applicant or owner of the forfeited application —an application which has passed the ordeal of examination and been deemed worthy of a patent—is debarred from renewing the same at all, or from showing unavoidable delay, after the expiration of two years subsequent to the allowance of the original application. This apparently unjust discrimination, however, has existed in the law for fourteen years. If it had been the design of the legislature to have put them all on the same footing, it certainly would not have passed a special act making the distinction. But it is a maxim of interpretation that it is not to be presumed that the legislature intended any part of a statute to be without meaning. To regard forfeited applications on the same footing as incomplete and abandoned applications, and allow a new application to be filed, or the delay explained by affidavits, however equitable the construction, would remove the distinction between the two classes of cases, and leave the imperative language of section 4897 without any meaning whatever. The Commissioner therefore denies the motion to renew Hardy's application.

The Tolles Amplifier.

Several correspondents have called our attention to a statement made by an exchange and reprinted in the SCIENTIFIC AMERICAN of March 9, 1878, regarding the merit and novelty of a microscopical instrument known as Tolles' "amplifier," an accessory apparatus for increasing the power of the object glass by placing a lens between it and the eye piece. In the article referred to, the idea was conveyed, by implication, that this system was of recent introduction, and its value was questioned. In response to our call for further information regarding the matter we have a number of communications in which the writers describe their personal experience with the amplifier, and offer strong evidence in its favor.

Mr. Charles Stodder, of Boston, forwards an interesting series of microscopic photographs taken with the assistance of the Tolles amplifier, the subjects being human blood and that of snakes and fishes, with other mountings, and the appearance of these photographs confirms his favorable opinion. Mr. Stodder states that the amplifier has been in use for over twenty years, and remarks that he has a periodical of 1859 which contains an advertisement of it.

Dr. J. B. Treadwell writes that he has used the instrument for several years, and sums up the general result of his experience as follows: "It doubles the power without impairing the definition. The advantage of obtaining increased power by this means over that of securing the same end by the use of shorter eye pieces lies in the fact that with the former method there is vastly better light than with the latter. For instance, the light obtained by the use of the amplifier and a one inch eye piece is as good as that obtained by the use of a three fourths inch eye piece without the amplifier, the amplification in the former case being much greater and the definition fully as good. With some objectives the amplifier gives a flatness of field not obtainable without it."

Brick Machines and their Capacities.

Gen. Q. A. Gillmore, in his report as a judge upon the brick machinery at the Centennial Exposition, prefaces his descriptions of the various machines with a classification, the essential points of which, as we give them below, will perhaps serve as a guide to the many correspondents who ask us as to the particular kind of apparatus suitable to such and such material. He distinguishes four classes, reference being had to the humidity and condition of the clay, as follows, namely: 1. Dry clay machines; 2. Crude or moist clay machines; 3. Tempered clay machines; and 4. Slush or mud machines.

In the first, clay is first dried, then crushed or granulated by rollers, and filled into brick moulds by hand, or by some device of filler boxes or graduated measures operated automatically. It is finally rendered compact by tamping, or by one or more applications of steady pressure. The moulds are usually filled to excess, and the bricks on emerging are shaved down to proper thickness by sizing knives. The objections to bricks thus made are that the difficulty of filling the moulds alike so as to produce bricks of uniform density, and the absence of moisture, are likely to cause imperfect cohesion during the moulding process or incomplete fusion in the kiln. General Gillmore also states that dry clay bricks possess, in an inferior degree, the power to withstand the disintegrating effects of the weather, especially in high latitudes.

In crude or moist clay machines, the clay is worked in its natural state as it comes from the bed. Disintegration, as before, is followed by pressure into moulds, and finish is given by the knife or smoothing plate. These bricks are more plastic than those of dry clay, and can generally be hand pressed if desired, immediately after they are delivered from the machine.

Tempered clay machines are usually the cheapest, though there are exceptions to this rule. The usual device is a pug mill, in which spiral arms mix the material while cutting it, and at the same time push it forward to the end of the cylinder, where it receives compression either by being forced through a contracted opening or die, issuing therefrom in the form of a continuous bar, which is afterwards cut up into bricks, or by being fed and pressed into moulds. As the expressed bar has a uniform cross section, a full set of dies of different forms will enable a single machine to produce in turn solid, perforated, or cornice bricks, floor and drain tiles, and other forms.

The slush or mud machines work only to advantage upon very soft and highly tempered clay, and no opinion is expressed upon them in the report under review.

The various machines exhibited at the Centennial are described in turn, and of these the principal features and capacities are stated as follows: Garretson's machine compresses dry clay by wooden iron shod rammers. Small power is required to run it, and the quoted capacity is 18,000 bricks per 10 hours. Morand's machine tempers the clay in two pug mills, and forms and presses the clay in a horizontal revolving mould table. Hand pressing and drying immediately follows. The bricks possess a high degree of homogeneity and plasticity, and are produced at the rate of from 22,000 to 24,000 per 10 hours' average work. Chambers' machine pugs the clay and forces it into and through a die, in which the round bar is reduced to one of rectangular section. The cutting device is a thin blade of steel secured radially to the periphery of a wheel. After the bricks are cut they are conveyed by an endless belt to a sanding machine. The two sizes of the machine respectively produce from 25,000 to 35,000 and 15,000 to 25,000 bricks per 10 hours. Tiffany's machine has the novel feature of two two-bladed screws behind the die, revolving in opposite directions. The issuing bar is cut by wires. The maximum production is 14,000 to 15,000 bricks in 10 hours. The Durand & Marais machine (French) has a horizontal plunger operated by a revolving cam, which compresses the material into a die, making one brick at each revolution. It works at its best in partially dry material, such as clay directly from the bank, which has been disintegrated between rollers. It does not produce a plastic brick. The capacity is from 9,000 to 10,000 bricks in 10 hours. The Ichlickeysen (German) machine consists of a horizontal pugging mill with double driving gear, surmounted by a water box for moistening the clay, a die, and a cutting table. The cutting rack moves to and from the die on wheels instead of on rockers, as in the Tiffany machine. The largest size machine driven by a 20 horse engine is capable of producing about 50,000 bricks per 10 hours.

The Imperial brick machine we illustrated quite recently. It has a horizontal pug mill, and the moulds are placed in a concentric circle on the vertical wheel, whence they pass to an endless belt. The average speed is quoted as five revolutions of the mould wheel per minute, producing 24,000 stiff plastic well moulded bricks in 10 hours. The principal feature of the Gregg impact machine is a horizontal rotating mould wheel, containing near its perimeter 32 brick moulds, divided into eight groups. The moulds have movable bottoms, and the tempered clay is compacted on them by heavy stampers delivering blows. At 1¼ revolution of the mould wheel per minute, and with a 15 horse power engine, 25,000 bricks are made per 10 hours. The Carnell machine has an upright pug mill, from which the clay is forced to a segmental false bottom, in which a cam forces the clay out into a mould, the bar being cut by thin steel blades. The rate of production is from 18,000 to 20,000 bricks per 10 hours. The Gregg combination machine consists of a horizontal revolving mould table made of cast iron, containing a number of moulds near the perimeter, into which the clay is fed in succession. Pressure is applied by plungers from below, and each brick receives three compressions. With an engine of 1 horse power, and 8 moulds in the table, 10,000 bricks can be produced in 10 hours. The Excelsior machine has two sets of moulds fixed in an alternating carriage that passes under a feeder, which fills the moulds with clay; and these pass and repass under a wheel, which imparts to the brick two downward pressures. Pistons attached to the mould bottom give the bricks an upward pressure, and afterward lift them from the moulds. The productive capacity is quoted at 30,000 bricks per 10 hours. Gregg's triple pressure machine has an intermittently revolving mould table, with which are combined devices for filling the moulds with clay, for compacting the clay by pressure from above and below, for compensating for unequal filling of the moulds by yielding plungers, which impress upon the sides of the brick recesses with depths varying with the quantity of clay in the mould, and finally, for expelling the bricks upward. Two revolutions of the mould table per minute yield 38,400 bricks per 10 hours. Aiken's machine expresses a bar, which is cut up by wires. The average productive capacity is 20,000 bricks per 10 hours.

Astronomy and the Calendar.

Professor D. G. Eaton, of the Packer Institute, Brooklyn, N. Y., lately delivered a lecture in that city on the above subject:

There are three great natural units necessary to the measurement of time. These units are found in the movement of the celestial bodies. The first is the revolution of the earth upon its axis, which measures day and night. This is the foundation of all measurement of time. The rising and setting of the sun is not uniform, but the time of the rising and setting of a star, such as Sirius, which may be seen near the meridian, is the same throughout all ages. It was the same a thousand years ago, and will be the same a thousand years hence. The other natural units of time are the month and year. Such an adjustment of the civil to the natural year as shall cause the perpetual recurrence of the seasons upon the same month is what constitutes the calendar. The artificial units of time are the week, hour, minute, and second. The account of the origin of the week can be found nowhere except in the books of Moses, though it is a division of time that was known to all the civilized nations of antiquity. It was not, however, until after the time of the Emperor Theodosius, that it was introduced among the Romans. The lecturer at this point gave an explanation of the way in which the days of the week were named by the ancient Egyptians and renamed by the Saxons. He also gave an account of the confusion which was caused in the Roman calendar by the vanity of the Emperor Augustus, who, after having the eighth month of the year named after himself, caused another day to be added to the number which it contained before, that the month of July (named after Julius Cæsar) should not exceed it in length. To regain the balance of days in each month, one day was taken from both September and November. English jealousy of the Papal power also caused confusion in the uniformity of the calendar by hesitating for more than two hundred years to accept the change in the old style of reckoning recommended by Pope Gregory and accepted at once by all Catholic countries. It was in 1752 that the new style was adopted in England by act of Parliament, and it has not yet been introduced into the Russian Empire. The motive which induced Pope Gregory to make this important change, which for a long time created so much confusion, was merely to regulate the recurrence of Easter Sunday. Though the motive was apparently of such slight importance, yet the result has been of great good to mankind. It is still a matter of difficulty for chronologists to settle the date of events which occurred in the remote past, and their task has not been lightened by the changes made in the calendar by some of the Roman emperors and the pontiffs of the Catholic Church. Professor Eaton's lecture was illustrated by off-hand sketches on the blackboard.

Limestone Bearings.

Mr. James A. Goodrich, of Moravia, N. Y., sends us an account of a waterwheel at that place, which was in constant use to furnish power for a grist mill for about 50 years. He describes it as a heavy, overshot wheel, 24 feet in diameter, on a wooden shaft, with cast iron journals resting on boxes of the Moravia limestone. At intervals of about 12 years the shaft would become rotten and have to be replaced, but the old wing gudgeons, journals, and limestone boxes were retained. The bearings were lubricated with tallow. Our correspondent states that notwithstanding this long service the only perceptible effect on the journals and boxes was a fine polish, without appreciable wear, and that the arrangement was apparently good for ages at the time the old wheel was taken down to give place to a modern turbine.