in the United States. We believe such roads would prove remunerative, and at once be viewed with favor in many localities as a substitute for the plank roads which have so generally proved a disappointment.

WHITE GUNPOWDER.

White Gunpowder is again receiving attention; a result no doubt attributable to the failure of most of the explosive compounds, to supersede ordinary gunpowder for fire-arms. For blasting, some of these compounds have been shown to be of great value; but their adaption to this purpose on account of the suddenness and violence of their explosions, renders them unfit for use either in large or small fire-arms. It is a settled principle in gunnery that an explosive agent should not burn instantaneously in a gun, to act most efficiently as a projectile agent; and in proportion to the size of the guns in which ordinary gunpowder is to be used, its method of manufacture is modified to insure its burning with sufficient tardiness to impart its force to the ball as uniformly as possible until it leaves the mouth of the gun.

In the manufacture of all these substances except the white gunpowder, there is more or less danger. Taking this fact into consideration, if the white gunpowder can be shown to act with equal or greater efficiency, to be as cheap or cheaper than the black, and not injurious by its chemical action to the mechanism of fire-arms, it ought to be adopted without hesitation. Has this been satisfactorily proved? We think not; yet we are far from believing that it cannot be. That it is well adapted to small arms is quite possible, but that it is equally fit for heavy artillery is we think open to question. Having ourselves made and experimented with this powder, we believe it to be, notwithstanding the statements published in regard to it, much quicker in its combustion than the artillery powders manufactured in this country. Having said this we are prepared to admit that it seems possible to so modify its composition as to make it sufficiently slow, but at the same time we think its explosive force would be weakened, so that it would be little if any superior to common artillery powder. But if equal to the latter in energy that is enough to establish its value, provided it can be made without danger and cheaper than black gunpowder.

That this can be done will be evident from its composition, and the mode of making it. It consists of Chlorate of Potash, 48 parts; Yellow Prussiate of Potash, 29 parts; Finest Loaf Sugar, 23 parts. The yellow prussiate should be dried in an iron ladle until it is as white as the chlorate of potash. All the materials should be separately pulverized. If the same mortar or mill is used for each, it should be cleaned after each substance is ground. The materials are then mixed by sifting them over and again to insure uniformity. All trituration in mixing should be avoided. Made in this manner there is not the slightest danger. It should not be rammed hard but pressed down solid by the ramrod. Only a little more than half as much will be required for a charge as of the ordinary powder. Although it should cost somewhat more in the first instance by weight than black gunpowder, when compared in regard to efficiency it would be cheaper than any powder in market; but on account of its not being granulated, it should be used in cartridges. These cartridges can be made, by persons of ordinary ingenuity, of paper or gut, and will obviate the difficulty which would be otherwise experienced in obtaining equal charges in the ordinary manner from a flask, arising from the non-granulation of the powder. An ordinary flask would not be adapted to carry it, as its mouth is so narrow that it would be difficult to get the powder in or out.

EXAMINERS TO BE EXAMINED.

Commissioner Foote contemplates making a thorough examination of the qualifications of the Examiners in his office, and to weed out all inefficient officers. There are about 40 persons to whom the higher duty of examining into the merits of inventions is intrusted, and all who are found deficient in qualifications are to be discharged. The Examiners receive higher salaries than those performing clerical duties, the policy being to excite a laudable ambition in the latter class. The Commissioner intends, also, to give the latter the preference in a competitive examination for the places of such Examiners as may fall short of the standard of qualifications.

That is good; and we have no doubt, if the examination is properly made, the Commissioner will find among the really good men some dunces who might be better employed in other business. We hope this examination will be extended throughout the whole official force, and if there are any Examiners or employés who are interested in the success of patent agencies or attorneys either at Washington or elsewhere they should be discharged. There is already a strong suspicion that some clerks are unfaithful to their trusts.

THE BOWERY EXPLOSION.---THE ENGINEER'S DEFENCE.

The explosion of the boiler of one of the metropolitan steam fire engines, at a fire on the Bowery, New York city, is still fresh in the recollection of our readers. It will be remembered, also, that the engineer, Mr. Patrick W. Hand, who was severely injured by the explosion, was censured by the coroner's jury and the daily press. He has lately published a certificate of his abilities as an engineer and a demand for a more thorough investigation into the causes of the explosion, with a view to his vindication, signed by a number of practical mechanics. We think Mr. Hand's proposition for an investigation by a committee of engineers should receive consideration, as his reputation as a mechanic cannot but be greatly injured by the imputation of incapacity conveyed by the strictures of which he has been the object.

OUR PLANET—ITS PAST AND FUTURE.

The above is the title of a very interesting little volume published by William Denton, Boston. It is a series of eight lectures on geology, in the popular style now so much in vogue, and is well calculated to bring science down to the level of the masses. These lectures seem to do this very successfully. They abound in vivid description, and are as far as may be, freed from the technical character of more extended works. The following extract, intended to show that the resources of modern civilization will prove sufficient for the future necessities of mankind, is a good specimen of the style of the work:

"As long as the world exists, then, we may be assured that man's ingenuity will keep pace with his necessities, and the human race march on to the goal that lies before them.

"Man is an important part of Nature; and his importance increases hourly. At first a helpless log, he floated on the stream, but now stems the current, or boldly directs it.

"If the land-surface of the globe should not increase naturally in the future, as we have anticipated, man's agency would, without doubt, bring it to pass, as is evident from what he has already accomplished.

"In Lincolnshire, England, four hundred thousand acres of fever-and-ague-breeding swamp-land have been transformed into fields of wheat, barley, and oats, and excellent meadows. In the Netherlands, lands lying still lower than the fens of Lincolnshire, and apparently much more hopelessly doomed, have been reclaimed, and become among the most productive. It has been calculated that nearly nine hundred thousand acres have been gained there by diking and draining. 'The province of Zealand consists of islands washed by the sea on their western coasts, and separated by the many channels through which the Schelde and some other rivers find their way to the ocean. In the twelfth century, these islands were much smaller and more numerous than at present. They have been gradually enlarged, and, in several instances, at last connected by the extension of their system of dikes. Walcheren is formed of ten islets united into one. At the middle of the fifteenth century, Goeree and Overflakkee consisted of separate islands, containing altogether about ten thousand acres. By means of above sixty successive advances of the dikes, they have been brought to compose a single island, whose area is not less than sixty thousand acres.'

"A few years ago, an English gentleman purchased for a trifling sum a small island which was covered by the sea every flood-tide, but left dry at the ebb. He enclosed it with a bank of earth thirty feet wide at the bottom, and seven feet high and four feet wide at the top, with a slope on the outside having two feet horizontal to one perpendicular. This wall, about two miles and a half long, encircled the island, except a gap about seventy feet wide, through which the tide flowed in and out. Earth was at first used to close the gap; but the sea swept it away as fast as it was thrown in. Piles were then driven in a double row, and clay rammed in between them. This succeeded, and the little island was drained. In time, excellent crops were raised upon it, a house and barn built, and nearly three hundred acres of land, by the energy of one man, won from the sea.

"The draining of Lake Haarlem is one of the best examples that we possess of man's disposition and power to change water-surfaces into dry land; and is at the same time a prophecy of what will be done in the future, when the earth shall be as densely populated over its whole extent as it is now in Holland.

"Here was a lake fifteen miles long, and seven broad in its greatest width. What fine farms we might have here,' said an enterprising Hollander, 'if this lake were only drained!'—'Yes; but it lies below the sea-level, and it would be impossible to drain it.'—'Then we must pump it dry.'—'Pump it dry! Who ever heard of such an absurdity?' But pump it dry they did. For this purpose, three large steam-engines were employed, each pumping a million tuns of water in twenty-five and a half hours. They commenced pumping in May, 1848; and laid it dry in July, 1852. Where the boats sailed and the fishes swam are now comfortable cottages, fertile fields, and a population of five thousand thriving citizens. In the same country it is now proposed to drain the Zuyder Zee, which covers two thousand square miles. The time will come when the land under Lake Erie will be of more value than the water within it; and, when that time comes, man will say to the waters, 'March!' and they will go, leaving the land for man's occupancy. Its greatest depth is but two hundred and seventy feet, and its drainage would be an easy matter. In like manner, the lands of Lakes Michigan and Superior will be needed, demanded, and obtained, and the sea be made to give up a large portion of its shallow shores to supply man's constantly-increasing demand for room."

The remarks of the author upon the climatic changes that have occurred within the historic period, and the remains of man in connection with those of extinct animals, are interesting and instructive. Although we cannot endorse all the inferences and opinions contained in the book, we believe it to be a meritorious contribution to popular scientific literature.

INTERESTING BORING AND MINING EXPERIMENTS.

A large number of gentlemen interested in mining and quarrying recently assembled at the lime quarries at Wrexham, Wales, to witness some interesting experiments with Haupt's improved Rock Drill. This machine was originally an American invention, but during the last year it has been much improved and rendered more practical and effective. The machine in its present form, is very compact, weighing only 150 lbs. It is operated by one man. All the working parts are made of hardened steel, in order to bear the severe work which it is designed to perform. It has a simple frame, with four adjustable legs, weighing about 90 lbs. The entire machine and frame can be easily moved by two men. The machine gives the same motions which are given to the hand drill, and is self-adjusting to all differences in hardness of rocks. The motive power in the experiments above alluded to, was steam, for which compressed air may be substituted upon occasion. The machine is capable of making from 400 to 500 strokes per minute, the force of the stroke being estimated at 200 lbs. It requires a force of two-horse power to drive it. The machine was operated upon this occasion by means of steam brought through a flexible tube from a locomotive in the quarry. The rock drilled was a seam of the hardest limestone. The first experiment was with a one and five-eighth inch drill, with a jet of water flowing into the bore to carry off the dust and keep it cool. The machine was put to its full speed, and in somewhat less than two and a half minutes, the tool penetrated sixteen inches. A drill of one and three-eighth inches was then set to work in the same hole, when an average rate of five inches per minute was attained. A hole thirty-two inches in depth was thus drilled in less than ten minutes, including stoppages. Subsequent experiments showed that this machine was equally adapted to horizontal, vertical, or angular drilling, and that irregularities of surface did not interfere with its adjustment.

These experiments were followed by some experiments with dynamite. Our readers are aware that nitro glycerin is formed by the action of nitric acid upon glycerin. Dynamite is nitro glycerin absorbed by silicious earth and in appearance resembles very closely coarse, brown sugar. Its properties are merely those of nitro glycerin, modified by the silicious substance, so that the dangers which attend the use of the former, are entirely obviated, while the strength of the explosion, when brought about by proper agents is augmented.

To show its harmlessness when stored or transported, a quantity of it was placed loosely upon a stone and set on fire by a match; when it slowly burned away, no explosion taking place. A similar quantity being placed in a like position and being fired by means of a fuse having the end placed in the dynamite terminating in a percussion cap, caused an explosion louder than a thirty-two pounder. This experiment was intended to show that without the charge of fulminate of mercury contained in the cap, or its equivalent, an explosion could not be produced. Next, the holes drilled as above, were charged with dynamite, some being tamped with sand, and others with water. The explosions in each case disengaged large masses of rock. The amount thus broken up was estimated as being six times as great as would have been the case with the same weight of gunpowder. One charge of one and a half pounds was placed in a horizontal hole nine feet in length, and, though the tamping was not well done, it was estimated that at least 1,000 tons of rock were detached by the explosion. These experiments, and many others which are constantly taking place, establish the great utility of dynamite beyond a doubt, and we believe the day is not far distant when it will supersede all other explosive agents for blasting.

INTERESTING TO RAILROAD TRAVELERS.—Judge Sharswood, of the Supreme Court of Pennsylvania, has decided that the platform of a railway company, at its station or stopping place, is in no sense a public highway, and that there is no dedication to public use. Persons are allowed to walk over it for other purposes than as passengers arriving and departing in the trains, but they have no legal right to do so, and the servants of the company, after requesting them to leave, can remove them by whatever force may be necessary.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING AUGUST 25, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat.....$10
On filing each application for a Patent, except for a design.....$15
On issuing each original Patent.....$20
On appeal to Commissioner of Patents.....$20
On application for Reissue.....$30
On application for Extension of Patent.....$50
On granting the Extension.....$50
On filing a Disclaimer.....$10
On filing application for Design (three and a half years).....$10
On filing application for Design (seven years).....$15
On filing application for Design (fourteen years).....$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

81,320.—STEAM SAFETY VALVE.—E. G. Allen, Boston, Mass.

1 claim, 1st, The combination of a spring, g, sleeve, d, and stem, c, substantially as and for the purpose specified.

2d, Constructing the let-off pipe with the perforations, s s s, as and for the purpose described.

3d, So arranging a whistle with reference to the safety valve that, at the first escape of the steam from said valve, the whistle will be sounded, and will continue to sound so long as the steam continues to escape, substantially as shown and described.

81,321.—LAMP BURNER.—John Allen, New York city. Antedated Aug 12 1 67.

I claim the adjustable draft or air regulator, A, arranged, constructed, and operated on the center-extension screw, B, substantially as described and for the purpose set forth.

81,322.—RAILROAD-CAR HEATER.—Ira R. Amsden, Buffalo, N. Y

I claim, 1st, Constructing a furnace car with a furnace or furnaces, C C, and surrounding chamber, K, provided with transverse or intermediate partitions, a a, having suitable apertures for the passage of air, substantially as shown and for the purpose described.

2d, The combination of the furnace or furnaces, C, space, K, and partitions, a a, constructed substantially as described, with a receiving chamber, J, and fan blower, I, the whole constituting the furnace car, as herein set forth.

3d, As a whole, the construction of furnaces, C C, surrounding chamber, K,