

The past winter was of a uniform coldness, without being too severe, and the fruit having thus far escaped the spring frosts, which some seasons fatally assail it, our prospects for an abundant crop are quite promising.

METEOROLOGY.

The subject of meteorology is one that should attract more general attention than it does, its laws being comparatively unknown at the present time, and even the most trifling observations, suggestions and experiments made with reference to this important science should be recorded and carefully examined and preserved. We constantly meet with persons of but little general intelligence who can predict almost with certainty some of the approaching changes of wind or weather, by carefully noticing certain indications which are known from their own and the experience of others to be generally correct. Were all the weather philosophy of farmers, sailors, fishermen, hunters, shepherds, stage drivers, and others, collected, it would constitute a volume filled in a great measure with suggestive information; and like the unavailing search after "the philosopher's stone," or fruitless experimenting in the hopes of discovering "perpetual motion," though not resulting in positive success, the very failures and disappointments experienced by the alchemist and the mechanical experimenter have been the means of opening new channels of thought in the minds of others, terminating in the wonderful discoveries of the chemist and the magnificent mechanical contrivances of modern times.

The united historical evidence from the battlefields and naval engagements of Europe since the commencement of the present century, and of our own battle-field during the rebellion, concur in sustaining the meteorological fact that cannonading affects the atmosphere to such an extent that thunder-storms and heavy rains, or rains alone, almost always accompany or succeed where it has been for many hours heavy and continuous. This war has also demonstrated, what is of more importance to us, that heavy and continuous firing affects the atmosphere not only in its own immediate vicinity, but at hundreds of miles west or north of it, by producing within a few hours sudden, and, in most cases, unseasonable changes of the winds, usually accompanied by cloudy weather or rain without thunder-storms; and in no instance at any season for the last three years has a general engagement been immediately succeeded in this latitude by severe cold weather, the cannonading appearing to have complete control over the currents of air producing cold.

If, then, the cannonading of this war, which was confined to certain lines of latitude and longitude, produced rain in their own vicinity, and at points more or less distant, what effect would cannonading from batteries arranged across the continent on different lines of latitude, and connected by telegraph so as to notify of approaching storms, have on the atmospheric currents? Would batteries, taking St. Paul's as the line of latitude, have dispersed the cold storm of January 1, 1864, thereby preserving from destruction so many valuable animals and fruit trees, or the August frost of 1863, which destroyed half the value of the growing crops of the West? or batteries, taking Chicago as the line of latitude, check the spring frosts that so frequently annihilate our fruit and damage our wheat, after they have escaped all the perils of winter? or at what points should batteries be worked this present season for the purpose of suspending for a short period the rains which are now retarding the planting of the staple crops of the West?

Surrounding the coast of Great Britain there is a system of signals warning mariners of approaching storms, the signal stations being connected by telegraph. If cannonading can disperse those storms, how much more advantageous would it be to the seamen and fishermen than to be compelled to remain in port waiting for the storms to disperse themselves.

These are all points of much interest, and are worthy of being experimented on under the supervision and control of an enlightened and unprejudiced meteorologist. Before the removal of the batteries from the vicinity of Richmond and other points it is the duty of the Government to institute a series of experiments bearing on this subject, which, if conducted systematically and honestly, will certainly, in this latitude, go to sustain the rain theory.

ROPER'S ENGINE.

Messrs. Butterfield & Haven, of your city have just furnished a printing office here, with one of the largest sized "Roper's Calorics." This beautiful piece of mechanism reflects the highest credit on the accurate workmanship of the builders, there being no tantalizing leaks, binding places or drawbacks to retard its erection or standing, the whole occupying but eight hours; its movement from the beginning being apparently as accurate as that of a well-constructed clock.

By connecting with the exhaust of these machines a hollow shaft, on which are placed at proper distances two sheet-iron disks formed like watch glasses, the concaves opposite each other, and similar in their general arrangements to the exhaust disks used by the "London Atmospheric Railway," it is very probable that a large percentage of power might be added to those calorics, this form of exhaust requiring comparatively but little power to operate it. A similar device might be applied to high-pressure engines with advantage; some of your enterprising mechanics should give this a thorough trial; it is entitled to it. Why not apply these machines especially to the heating of buildings, regardless of their power purposes?

The exhaust of the machine would furnish a large amount of heat, or it could be driven into a supplementary dome, and additional heat added before passing off; or an additional pump worked by the machine could drive air into one or more additional domes. The large amount of fresh air which these machines consume should make them the very best and cheapest appliances for heating that is now before the public.

Springfield, Ill., May 15, 1865.

[We are pleased to give our correspondent a hearing, but do not indorse his views.—Eds.]

BOOKS AND PUBLICATIONS.

BODEMANN AND KERL'S ASSAYING.—This is a small book of 214 pages, published for the "Berzelius Society," by John Wiley & Son, 535 Broadway, New York. It is translated from the German by W. A. Goodyear, Ph. B., late Assistant in the Sheffield Scientific School, etc. It embraces only that portion of Bodemann's work relating to the assay of lead, copper, silver, gold and mercury. It is intended especially for proficients, and will be regarded by them as indispensable unless they possess the original. The incongruous weights of the German States are not reduced to the French standard, a labor which would have materially increased the value of the translation.

Benzoin as an Insecticide.

As our houses and gardens are always more or less infested with vermin, it is satisfactory to know that benzoin, an article well-known as a detergent, is efficacious as an insecticide. Two drops are sufficient to suffocate the most redoubtable pest, be it beetle, cockchafer, spider, slug, caterpillar, or other creeping thing. Even rats and mice decamp from any place sprinkled with a few drops of benzoin. A singular fact connected with this application of benzoin is, that the bodies of the insects killed by it become so rigid that their wings, legs, etc., will break rather than bend, if touched. Next day, however, when the benzoin has evaporated, suppleness is restored.—*Boston Cultivator*.

[This must be benzine; benzoin is a gum.—Eds.]

Rate of Emigration.

The whole number of immigrants who arrived at New York City in the first three days of the week ending the 20th of May, was 4,681. Two steamers arrived subsequently, swelling the total to about 6,000. Another ship was expected, and possibly a steamer, which may bring the figures to 7,000. This is at the rate of 28,000 per month, or 336,000 per annum, at a single port, when the season for large arrivals has not commenced. That begins in June, and usually continues to October and November. We have not seen a report of the arrivals at other places; but every European steamer brings fresh intelligence of the swelling exodus on its way hither, comprehending every nation from the Caspian to the North Sea—every occupation, and that physical ability we can measure from experience.



Are Copper Cartridges Unreliable in Cold Weather?

MESSRS. EDITORS:—In your issue of May 20, I notice a letter from H. W. S. Cleveland, in which the statement is made that "copper cartridges are unreliable in cold weather." Now, this seems so strange and new to me that I am prompted to give my own experience in the matter. I have used a Wesson rifle nearly four years, and in all kinds of weather peculiar to this latitude. During this time I have used not less than one thousand cartridges—possibly nearly double this number—and they have never missed fire but twice. The first instance was a warm day in September, 1863; and, as it had never missed fire before, I was a little surprised; but on removing the cartridge and turning it around half way, it exploded on the first trial. The second instance was a very cold day in December following. After trying this cartridge till the end was full of indentations, I placed it in my pocket for inspection.

Now, what was the cause of these cartridges missing fire? I attribute the failure of the first to the absence of fulminating powder in the part first struck; but the failure of the second was not caused by cold weather, as a close examination proved. On opening this cartridge, I could discover no trace of fulminating powder! Both of these cartridges were taken from the same box. Now if cold weather destroys, for the time, the fulminate in the cartridge, why does it not also destroy the percussion cap? Before we accept this cold-weather theory, let us hear from others. What say you, riflemen?

L. H. PLAISTED.

Woonsocket, R. I., May 22, 1865.

The Trials of a Patentee.

MESSRS. EDITORS:—Not feeling in a very amiable mood, I address you relative to the troubles of a patentee—myself, and others similarly situated. There appears to be an organized band of patent thieves in this place; their *modus operandi* is first to obtain, if possible, power of attorney to sell the patent. If successful the victim had as well engage in other pursuits, for he has given away his patent. If not successful, they try to buy portions of the territory, offering a very small sum, accompanied with the threat that they intend to sell it, with or without your consent, endeavoring to bully a poor fellow to accede to their demand. Both of these methods failing, then some one of the fraternity assumes to be the patentee, who commissions, with power of attorney, the others, and they go forth to victimize unsuspecting parties whenever and wherever they find an opportunity. The difficulty arising from their rascality to the patentee, is his inability to come in contact with persons buying of them, and having to satisfy them that they have been "sold"—to use a slang phrase—which is a serious one sometimes. Now, if there is no mode to bring these gentry to justice there should be. They are irresponsible parties so far as property "comeatable" is concerned.

I hope you will call attention to these pests through your valuable publication, for they are the cause of much of the deep-rooted antipathy to patent venders. I don't care how good a patent a man has to sell, he is looked upon as a swindler—making it a very disagreeable business to persons of sensitive natures. If a law of Congress could be obtained that might reach the offenders more direct, and without such enormous expenses, it would confer great favor upon many honest and poor inventors. A. C. T.

Galesburg, Ill., May 12, 1865.

[We publish our correspondent's letter with the hope that it may lead to the exposure of the characters to whom it refers. If one or two of them could be tried and punished as swindlers, it would speedily break up the practice complained of. Patentees should be very careful not to commission unworthy men to sell their rights. The business of selling patents is just as reputable as any other sanctioned by law, and just as few swindlers are engaged in the business as in any other. There are plenty of rogues in all trades and professions.—Eds.]

Proposed National Monument to Abraham Lincoln, at Springfield, Ill.

MESSRS. EDITORS:—About three miles from Springfield is situated "Oak Ridge Cemetery," one of the burial places of the city. Within the public tomb which is used as a place of temporary interment for the remains of those whose friends do not desire an immediate burial in the earth, in compliance with the wishes of his family, are, for the present, deposited the remains of Mr. Lincoln. Before the wishes of Mr. Lincoln's family had been made known to the citizens of Springfield they had purchased the family property of Mrs. Mather, containing eight acres of land, on which is a valuable house, and constructed a tomb thereon, the whole costing fifty thousand dollars. On this piece of ground they propose erecting some monumental structure of a national character, and are now actively engaged in soliciting, from all parts of the world, subscriptions—limited to not over five dollars—from such as feel disposed to contribute.

For many years to come Mr. Lincoln's remains will have to be guarded with sleepless vigilance, and immediate steps should be taken for their greater security, by enveloping them in masses of ponderous stone and iron, of such size and weight that even friends, with the assistance of the best mechanics, cannot get to them in less than twenty-four hours. At present there are one or two companies of soldiers guarding the tomb, but that is not sufficient security against the Booth sympathizers, many of whom, in retaliation for the unknown disposition of his body, would undertake and accomplish—unless every possible obstacle is presented to their villainous designs—the removal and concealment of Mr. Lincoln's remains. Somebody has acted unwisely in the disposition of Booth's body, and if it can be given up to his relatives sound policy would dictate that they should have it. The probability is that they would not take it, and that would be the end of the matter.

The erection of a testimonial in the form of a mausoleum, commemorative of such a great and good man as Mr. Lincoln, and of one of the most remarkable events in history—to be of a character corresponding with the fame, wealth and power of this nation—should be, architecturally, on the grandest scale, combining evidences for succeeding generations, in marble, stone, iron, brass, bronze and glass, of the skill and qualifications of our artists and artificers. In dimensions, it should be sufficiently spacious for the allotment to each State of the Union of ample room, whereon to erect monumental evidences of their sympathy, surrounding the principal testimonial with sculptural effigies of their noble sons who have made an immortal record during the rebellion. Foreign countries should also have their appropriate places for the expression of their silent regard, and the principal monument itself should be a pedestal on which is erected a statue of Mr. Lincoln—natural size. There is no monumental record that has, or ever will, preserve the memory of the great dead more than a few centuries. History, and their effigies stamped on coins and medals, are the only records to be relied on. Mr. Lincoln has made his history; the people of the United States, acting through their Government, should make the other part. Five millions of dollars worth of gold made into medals, impressed with Mr. Lincoln's effigy, and the suitable inscription, of denominations of five, ten and twenty dollars; one million dollars worth of silver made into medals of various denominations, and one hundred thousand dollars in bronze medals, should be minted at the United States mint and sold for double their value, the profit on their sale to constitute a fund for defraying the expense of erecting the National Testimonial. Those medals would be purchased by his friends, and, in course of time, would get into circulation at their value as money. Many of them would be lost and buried, and thousands of years hence would be brought to light and preserved in the cabinets of the curious.

J. T. D.

Springfield, Ill., May 18, 1865.

A Household Steam Engine.

MESSRS. EDITORS:—May it not be profitable just now to examine the subject, and see if we cannot awake the attention of engineers to the importance of using far less water in boilers than the present system demands?

One cubic foot of distilled water weighs 62½ pounds, and contains 1,728 cubic inches; if we take a second of time as a unit of time, on the basis of evaporating 1,728 cubic inches of water to realize a horse-power per hour, one second is the 3,600th part of the time and also of the water, or 0.48 of a cubic inch, being in weight 121.53 troy grains, or a trifle less than a half cubic inch of water to be evaporated per second, to obtain during a second, one-horse power.

As air passes into a vacuum at about 1,800 feet per second, and steam, being specifically lighter, passes with greater speed, it occurred to me that, as we have many engines performing several revolutions in the second, and that as condensation practically takes place instantly, there should really be no serious difficulty in the way of making manageable household motor engines, worked from a boiler containing but a fraction of a cubic inch of water. After many experiments, I was enabled on a small scale to evaporate and condense at the rate of three revolutions per second, using the same water for steam and for a vacuum, thus practically obtaining a condensing engine. I also applied a modified plan to pump water and to drive a foot lathe. In working these motors I kept in view the need of maintaining uniform conditions. The result is hopeful for progress, and I trust the time is not greatly distant when small steam motors shall be as common as are eight-day clocks.

JOHN JOHNSON.

Saco, Me., May 23, 1865.

An Inventor's Letter.

MESSRS. MUNN & Co.—Sirs:—My patent came to hand yesterday all right, and I embrace, with a great deal of pleasure, the earliest opportunity to tender my sincere thanks for the truthfulness and fidelity with which the business has been done on your part. I shall ever feel the greatest pleasure in recommending you to any one wishing to obtain patents, as gentlemen worthy of all confidence. When I first thought of patenting a horse-shoe I supposed I could go to Washington and do the business better than to employ any agent, relying on the old adage, "That if you want business done, send a man; if well done, go yourself." I think, in this case, the rule won't work, as no common man can obtain a patent any other way so cheap or quick as through your agency. Hence I must say I think your institution just the place for inexperienced men to apply who wish to obtain patents. Yours truly,

LORING M. GUTEAU.

Batavia, N. Y., May 12, 1865.

Copper Cartridges.

MESSRS. EDITORS:—Noticing in your issue of May 20th a letter from Mr. H. W. S. Cleveland, stating that copper cartridges are unreliable in cold weather, I would state that for the last three years I have been in the daily habit of firing from 300 to 600 of these cartridges, and I never noticed any miss fire that I could attribute to the effect of cold. I have had some failures from defective manufacture. During the time referred to I must have fired at least 200,000 cartridges. My brother has had an experience almost equal to my own, and concurs with me in the opinion that the temperature has no injurious effect upon the reliability of this kind of ammunition. The cartridges we use are stored in a cold magazine, and are fired in a shed. No artificial heat in either place.

D. W. C. PERRY.

Boston, May 20, 1865.

Advantages of Publishing Inventions in the "Scientific American."

MESSRS. EDITORS:—To show what inventors gain by having their inventions illustrated in your valuable paper, I will state that I have just received an order for one of my stove-dressing machines from Stockholm, Sweden; the parties ordering it having noticed the illustration therein. In fact I have sold a good many machines from the same cause. Hoping that all inventors will avail themselves of the advantage of having their inventions illustrated in your columns, I remain yours, truly,

JASON PALMITER.

Jamestown, N. Y., May 17, 1865.

A Generous Proposal.

MESSRS. EDITORS:—I acknowledge the receipt of

two copies of the SCIENTIFIC AMERICAN, with thanks. I read them with pleasure, and would immediately subscribe but for poverty. Machinery has many charms for me—I love to reason and invent; for this I suffer. I have invented a machine that will work perpetually, and would like to give the invention to Gen. Grant, so that, without further trouble to me, the people of the United States could enjoy the benefit of a "Union Engine." All I ask is credit for the invention, which, for more than four years, I have believed to be the gift of God to man.

GEO. PARADOX HILL.

Davenport, N. Y., May 18, 1865.

Grafting Roses.

Grafting roses is not like grafting apples and pears; it is more of an intermediate process between budding and common grafting; the rose-grafters merely take a thicker slice of wood behind the bud than is done in budding—say a thicker and a little longer slice, and one bud only; then the stock needs only a like slice to be cut out of it, and the new bud and slice to be nicely fitted to the part without tonguing or wedging; nothing but to tie on the slice. Supposing you took a slice of bark and wood off a branch, and cut across the bottom to take it out fair, would it not be easy to stick on the same slice again, and tie it round with some soft binding? Of course it would; nothing was ever yet easier to learn in this world.

Rose-grafting is quite as easy, only you take the slice from a different branch, which is all the difference. But clever practitioners do it still easier. They cut off the head of the rose stock, and leave only a little stump out of the pot; from the top of this stump they slice off about 1½ inch down, and make a cut across the bottom of the slice, which leaves a notch there, and on that notch they rest or fit the bottom end of the graft slice, then cut the top end of the slice square with the top of the stock, tie and clay; sometimes they do not clay at all, but it is usual for ordinary people to put on a little clay for all kinds of grafts.

The best way to clay a rose graft and all pot grafts is, to put a lump of clay in a pot saucer and as much water as will make it into a soft paste, like very thick paint, and with a little brush paint the stock and graft all round, then dust it over with sand, which will keep it from cracking, and all is finished. Gardeners make their own brushes for this work; a bit of soft matting tied on the end of a stick like a pen holder is all they require. When you hear of people grafting roses in-doors, the plan is still more easy. There is no pot or mold, only so many rose stocks lifted out of the ground on purpose, and any of the ways of grafting will do.—*Journal of Horticulture.*

Subsidence of the Earth's Crust.

The commune of Buonotte, in France, is hourly menaced with utter destruction. Five manufactories have already been overthrown, and sixty-four more are threatened with imminent ruin. The inhabitants have fled in the greatest consternation to the neighboring villages. The cause of the disaster is a sudden and violent depression of the soil, which is at the present time accounted for by one of two reasons—either the fall of an immense mass of earth in the west of the district, or the yielding of the roof of an extensive subterranean cavern. But in reality nothing certain is yet known as to the cause of this most deplorable event. A number of civil engineers have hastened to the spot, and prompt measures are in course of adoption to prevent still greater disaster.

Life-saving Apparatus.

Signor Vallo, of Philadelphia, informs us that he has just patented an invention to prevent the wheels of railway cars from running over persons, who, from accident, may fall on the track. It is to be thoroughly tested on Tenth and Eleventh streets, of that city, shortly, and if successful he is to receive \$25,000 for the right for the United States. He intends having the invention illustrated in the SCIENTIFIC AMERICAN, with a full description.

In the dwelling houses lighted by gas, the frequent renewal of the air is of great importance. A single gas-burner will consume more oxygen, and produce more carbonic acid to deteriorate the atmosphere of a room, than six or eight candles.

Improved Hollow Auger.

Hollow augers are generally used by wagon makers and wheelwrights for tenoning the end of the spoke where it enters the felly; they may be used, however, on any other work requiring similar treatment.

This auger is remarkable for the celerity with which it can be accurately adjusted to any desired size. This is done by turning the plate, A, Fig. 2. This plate is also shown in Fig. 1. The ends of the jaws, B, are received in the scroll grooves, C, and the jaws themselves are forced in or out by turning the plate in one or the other direction. Two of these jaws have cutters, D, while the other two are guides to prevent the cutters from taking hold too rankly. When the cutters are set properly they are held fast by turning the nut or collar, E, at the back. This auger is intended to be used with a brace or power, and has a square shank or rod on one end to adapt it for either purpose. Mechanics using these tools will find this one convenient. One especially for chairmakers' use is now in course of manufacture.

It is made by the Douglas Manufacturing Company; address them or Sargent & Co., at 70 Beekman street New York.

GRAPERIES AND HORTICULTURAL BUILDINGS.

One of the most delightful objects of interest to be met with in the city of Paris, in the month of June, is the extensive exhibition and sale of rare and beautiful flowers. The art of flower and fruit culture has attained much greater perfection in France and England than in this country. We are a bustling, money-getting people, and, as a general thing, consider the time given to mere flower culture as so much wasted. This taste, however, we are happy to observe, has greatly improved within a few years, and the business of the nurseryman in this department is now quite large. An extensive grower of hot plants, from information carefully gathered among his fellow nurserymen, estimates that the plant trade of the vicinity of New York reaches nearly the sum of \$200,000 annually. One cultivator has stated, that during the fall of 1863 and winter of 1864, he cut and sent from his establishment 230,000 blooms of the various flowers he cultivates.

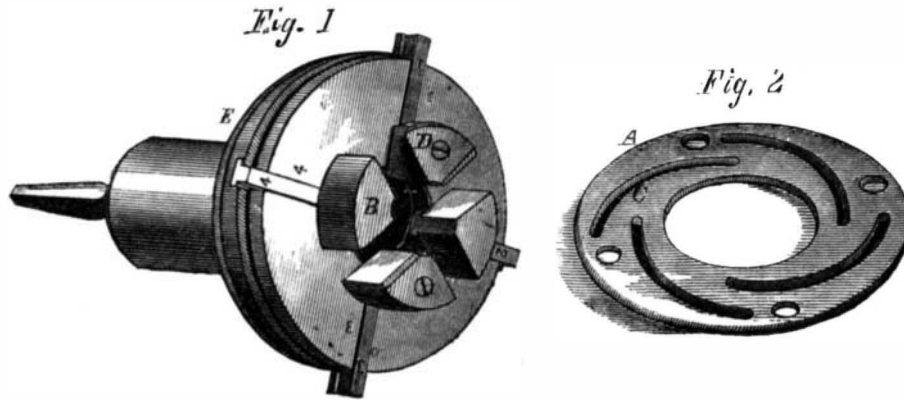
Small greenhouses or conservatories attached to dwellings are now frequently met with, both in city and country, and when joined to the dwelling to be entered from some one of the principal rooms, forms a feature of great attractiveness and pleasure.

The culture of choice varieties of exotic grapes is also rapidly increasing, both in hot and cold graperies. The luscious Frontignac and the Hamburg will repay the care and expense of a well-constructed glass-house for their propagation. There is no great mystery in regard to their culture, for any person of ordinary capacity can soon learn how to manage them. One of the most important things connected with the cultivation of rare grapes and flowers is to have a thoroughly-constructed glass-house. Information upon this subject is fully supplied in a recent volume entitled "Woodward's Graperies and Horticultural Buildings," just published by Geo. E. and F. W. Woodward, No. 37 Park Row. It contains twenty designs, and supplies a great amount of practical information hitherto difficult to be obtained except from professional men.

The Oil Regions.

A disgusted newspaper correspondent in the oil regions writes to a Cincinnati paper from Oil City:—"It is really astonishing to what indignities the people who are hunting oil will submit. The hotels are crowded and dirty. The street is one sea of diluted mud, which the straggling horses splash and splatter all over the houses and people. It is worth the price of a good suit of clothes to promenade Main street in Oil City for two days. But oil seekers

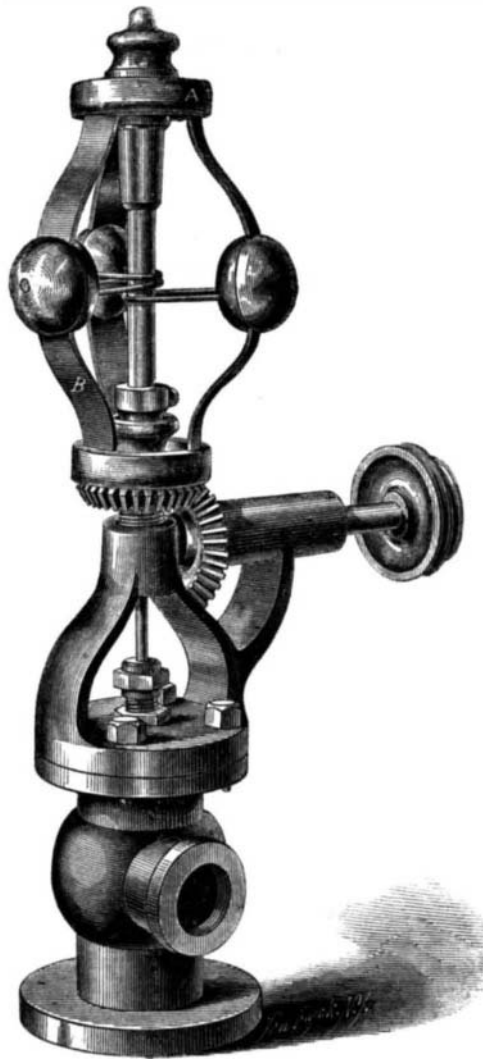
do more than this. They go on foot up the creek to the 'oil diggings,' over such roads as they never before walked on. And here, too, they are subjected to the same splashing process that prevails on the streets of the city. The road is but a continuation of the streets in all respects, and the pedestrian finds every tired horse or mule on the way just in the act of stumbling over some hidden rock, at the critical moment when his blundering foot can scatter most of the diluted mud. The result of this state of things

**EXPANDING HOLLOW AUGER.**

is apparent. Thousands who come to see are satisfied—no, disgusted—with the first night, and rush away by the morning train. It requires the impetus of a sure prospect of gain to induce one to remain more than a day, while only those who are making a 'pile' will consent to live here."

PICKERING'S GOVERNOR.

A very noticeable feature in this governor is its simplicity. It is free from joints and pins that must



fit tightly to operate properly, and has the fewest possible pieces to obtain the desired end—a certain and rapid control of the motion of the engine.

In detail, this governor is merely an upright shaft,

with two brass heads, A, one of which is connected to it, while the other—the top—is movable on it. The springs, B, are fastened to these heads at the top and bottom, and when rotary motion is applied to the shaft the balls on the springs fly out, precisely the same as with the old-fashioned governor; this causes the top, A, to move down on the shaft and depress the valve stem, which runs through it, thus regulating the flow into the steam chest of the engine. The valve itself is balanced, and is a cylinder with circular openings.—The speed at which this size runs is 475 revolutions per minute.

Large numbers of them are in use in various parts of the country, and in a recent visit to this office the inventor informed us that he was much behind his orders. It is very reliable, not apt to get deranged, and, in other respects, suitable for the purpose required of it.

This invention was patented through the Scientific American Patent Agency, Oct. 7, 1862, by Thos. R. Pickering, of New York; for further information address Pickering & Davis, No. 144

Greene street, New York City.

New Apparatus for Compressing Air.

An English journal thus speaks of a new method of compressing air, lately designed abroad:—

An improved apparatus, by means of which atmospheric air or gases may be compressed in volume to a far greater degree than has yet been accomplished by other means, such highly compressed air or gas being applicable to various useful purposes, has been provisionally specified by Mr. T. Coughin, of Bermondsey, England. He proposes a succession of pumps and receivers, the first pump receiving a supply of air from the atmosphere, and forcing the same into a receiver, whence it is conveyed to a second pump, already compressed; the second pump is then brought to bear upon the compressed air, which is then forced into a second receiver, and so on to a third or further series, and ultimately into a chamber or receiver of any kind or form, according to the purposes for which it is required. He proposes to make the diameter of the first pump larger than the second, and the second larger than the third, in order to compensate as far as possible the power required to actuate each according as the air or gases are more and more highly compressed in each. The pumps are to be set on a suitable foundation, above which, on standards, a shaft and fly-wheel are supported, to be turned by hand or steam power; on the shaft an eccentric or crank is keyed, in order to work the plunger of the first pump. The shaft is also provided with a cog wheel or pinion, on each side of which is a shaft and toothed wheel gearing with the central pinion, in order to actuate by similar eccentrics the other two plungers of the pumps. If more pumps are required they may be connected by similar gearing. The toothed wheel actuating the third pump should have a greater number of teeth than the second, in order that it may travel at a slower rate to operate upon the densely compressed atmosphere or gas; underneath, or at the side of each pump, is its receiver, connected by suitable tubes and valves, the whole series of pumps and receivers being thus in communication.

A METHOD has been discovered in Belgium to obtain a photographic groundwork for oil paintings. Fine canvas or silk, such as is employed for small and delicate works, is used. The process is simply to cover the surface with a preparation of collodion and chloride of silver, and expose and prepare it in the ordinary manner, just as in the case of paper.

THE King of Italy intends sending to the International Exhibition at Dublin a topaz weighing several pounds, and eight or nine inches long, having on it a beautiful engraving of "The Last Supper."