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Improved Horse Power.

An objection, to portable horse powers now in use, is the loss of power in transmitting rotary motion along the shafting with angles connected by couplings, these angles being necessary to place the shafting near the ground, so that the horses can step over it. These couplings and angles cause friction and wear, the result of which is loss of power, and a lack of durability which it is very desirable to obviate.

While overcoming these objections, the inventors of the machine herewith illustrated have succeeded in simplifying its construction so that the levers and other detachable parts may be easily carried on the axles of the wheels, that support the principal part of the machine, and between the sills. This is a great advantage, as other powers require extra appliances, to render the transportation of these parts convenient; which appliances increase cost, and are more or less troublesome in use.

The main feature of this improvement, which secures the advantages named, is the arrangement whereby the toothed wheel that drives the tumbling shaft, with its vertical shaft, and the pinion upon the upper end of the shaft may be raised together from the position shown in Fig. 2—the working position—up to, and held in, the position shown in Fig. 1, during transportation from place to place.

In working, the wheel that drives the tumbling shaft is thus brought down to the level of the shaft, and the objectionable angular transmission of motion is avoided. Another advantage is that the power may be transmitted from the front or rear, or from either side of the machine. The cost of construction is also lessened by dispensing with parts used in other more complicated powers.

When the wheel under consideration is raised, the whole under side of the vehicle is left clear, so that obstructions like low stumps or protruding rocks do not interfere with the progress over rough and uneven roads or fields.

The inventors state that they thoroughly tested the invention during the last season, and that its operation is very satisfactory in all respects.

The framework of the wheel that drives the tumbling shaft is sustained by four strong upright beams, which slide up and down in strong sleeves cast upon the framework of the upper driving gear, and which is held in the working position by nuts running upon threads cut on the bearers, the nuts abutting against the under ends of the sleeves, and the collars on the upper ends of the bearers being brought down against the upper ends of the sleeves.

The improvement is simple and practical, and, we judge, will add much to the convenience of this class of machines.

The invention was patented May 9, 1871, through the Scientific American Patent Agency. For further information address Harrison & Co., Belleville, Ill.

JESSE MEYERS leaned against a shaft revolving three hundred times per minute, in a slaughter house, Muncy, Ind. He undressed in about ten seconds, but strange to say he was not at all injured. Not a stitch of clothing remained upon him.

Mastodon Remains.

A farmer in the town of Mount Hope, Orange county, N. Y., digging recently in a swamp on his premises, exhumed from the muck, about eight feet below the surface, a number of bones which, from their size and formation, are supposed to be those of a mastodon. There are two ribs nearly five feet long, and two sections of vertebrae six inches wide.



HARRISON'S MOUNTED HORSE POWER.

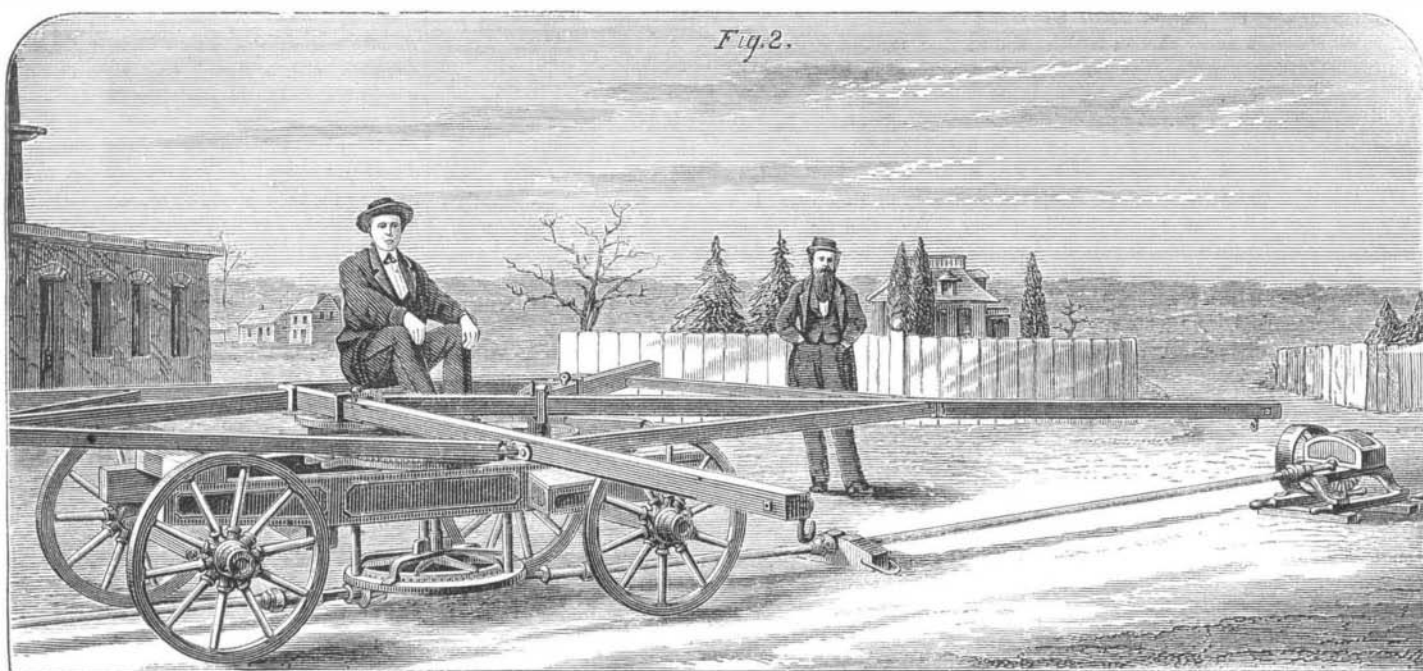
What would give strength to the supposition that the bones are a portion of the skeleton of one of those old time monsters, in the absence of other proof, is the fact that several discoveries of mastodon remains have been made in this county during the past thirty or forty years. In 1841, an entire skeleton was exhumed, in the vicinity of Scotchtown, from a marl pit. Its tusks were over five feet in length, and with the head bones weighed nearly 600 pounds. It was found near the surface, lying at an angle of about forty-five degrees, head uppermost. Previous to this, portions of over twenty skeletons of mastodons had been found in the Wallkill Valley. One of these was the monster that for years was

steam can be turned. The combustion of the nitrate can be replaced by a spray of nitric acid which would operate in the chamber itself or, if convenient, in a separate one.

Thus far the process is known and understood by the public; but, to oxidize the sulphurous acid, M. M. Langlois and Thomassin use ozone or active oxygen; first, by substituting it for the spray of nitric acid or the combustion of the nitrate, and secondly in using the ozone conjointly with the following nitrates or the products of their decomposition: hypoazotic acid, nitrous acid, or binoxide of azote.

A pump constructed of material indestructible by acids, such as lead, gutta percha, caoutchouc, etc., exhausts the

sulphuric vapors, which form and collect in the chamber, and compresses them in a cylinder. This cylinder is a closed utensil, capable of resisting a pressure of at least five atmospheres. It is similarly constructed of material which resists acids, and is furnished with appliances, such as valves, manometer, etc., arranged purposely to ensure safety. This cylinder contains water, of which the quantity is determined approximately, according to the desired concentration of the acid. The sulphuric or sulphurous acid va-



por begin, under the pressure, to bubble in the water, with which they are not slow to combine by reason of the great affinity of the sulphuric acid for water; and thus they produce, in a short time, a commercial sulphuric acid, at least as concentrated as the acid in the chambers. From the generating cylinder branches a lead pipe, communicating with a safety valve for the escape of azotic gas (hypoazotic or nitrous acid, or binoxide of azote) which would create pressure in the generating cylinder and be forced into the chamber. Instead of ordinary water for feeding the generating cylinder, oxygenated water (binoxide of hydrogen), prepared by well known processes, can be used; this substitution will have the recommendation of dispensing not only with the return pipe, but also with the combustion of the nitrate in or out of the

NEW USE FOR PARAFFIN.—Dr. Vohl announces that mixed with benzole or Canada balsam, paraffin affords a glazing for frescoes much superior to soluble glass. By covering the interior of wine casks, with a film of pure white paraffin poured in melted, he has effectually prevented the spoiling of the wine and its evaporation through the wood.

furnace, or with the nitric acid jet in the chamber. The pump can be worked by manual or steam power, according to the extent of the manufacture, as the process, as applied to sulphuric acid apparatus, can be used for making so small a quantity as five or six carboys of acid in twenty-four hours, if desired; and superficially it occupies but little space."

The inventors have taken out letters patent which cover the novel features of the above described method, namely: the use of the pump for exhaustion and compression, and of the cylinder or generator furnished with valves and safety appliances, the employment of ozone or active oxygen, alone or in conjunction with combustion of a nitrate or the jet of nitric acid, and the employment of oxygenated water (binoxide of hydrogen.)

THE LAW OF TRADE MARKS IN ENGLAND.

We believe this much debated question will have a practical settlement in the forthcoming session of Parliament; and it is, indeed, time that something was done to prevent even the most innocent infringements. Very properly, the Vice Chancellors are not disposed to strain the laws in favor of any particular houses, when it is shown that the copying of a trade mark has been purely accidental, yet, at the same time, it is extremely hard upon a firm to be told "I bought some of your brandy or champagne"—as the case might be—"the other day, and it was so inferior that I shall not purchase any more." Messrs. Martell & Co. had occasion, in 1871, to complain very seriously, not only that their trade mark had been infringed in a general way, but that a country printer had actually struck off a number of labels for brandy in bottle, in direct imitation of those so well known in the trade as connected with the genuine article. Of course an injunction was immediately granted by a Vice Chancellor, but we must say, that unless we can get an Act of Parliament, with penal clauses to be rigidly enforced in all these cases, very little good, in the shape of reform, will ever be done. Relative to the Chancery and common law rights anent trade marks, it will not now be at all out of place to quote one or two opinions that have been given in reference to existing statutes.

The Lord Chief Justice says—"An action for counterfeiting a trade mark is, in law, an action for fraudulent misrepresentation. Courts of equity exercise a jurisdiction for the protection of rights to trade marks upon the ground that they are rights of property. In law, no exclusive right of property in a trade mark in the abstract is recognized; but the exclusive right, to use such a mark for the purpose of authenticating a vendible commodity, is one for the invasion of which a remedy is given by an action in the nature of deceit." This is substantially what we have urged for so long; and we fancy, after all, that the common law courts would be the best tribunals to deal with these matters, provided a fine could be added to the damages; for not only is the owner of the trade mark damaged by the action of piracy, but the public also come in for a share of the wrong. In the case of *Rodgers vs. Nowill*, it was ruled that "as there is, therefore, no abstract right to trade marks recognized, the plaintiff in an action at law must show that the defendant had an intention to deceive and make the goods pass as his. The questions in such a case for the jury are: "Is the resemblance such as to deceive ordinary persons? Was the mark adopted by the defendant with that intent and in order to supplant the plaintiff's goods?" And in the case of *Blofield vs. Payne*, it was decided that "it is not necessary to show that defendant's goods are inferior to plaintiff's." By section 22 of 25 and 26 Vic., c. 68, it is provided that "in every case in which any person shall do, or cause to be done, any of the wrongful acts following (that is to say) shall forge or counterfeit any trade mark; or, for the purpose of sale, or for the purpose of any manufacture or trade, shall apply any forged or counterfeit trade mark, to any chattel or article, or to any cask, bottle, stopper, vessel, case, cover, wrapper, band, reel, ticket, label or thing in or with which any chattel or article shall be intended to be sold, or shall be sold, or uttered, or exposed for sale, or for any purpose of trade or manufacture, or shall enclose or place any chattel in, upon, under, or with any cask, etc., to which any trade mark shall have been falsely applied, or to which any forged or counterfeit trade mark shall have been applied: or shall apply or attach to any chattel or article, any cask, etc., to which any trade mark shall have been falsely applied, or to which any forged or counterfeit trade mark shall have been applied; or shall enclose, place, or attach any chattel or article in, upon, under, with or to any cask, etc., having thereon any trade mark of any other person: every person aggrieved by any such wrongful act shall be entitled to maintain an action or suit for damages in respect thereof against the person who shall be guilty of having done such act, or causing or procuring the same to be done, and for preventing the repetition or continuance of the wrongful act or the committal of any similar act." In the above quotation, the law of trade marks seems to be very clearly laid down, and when the words forged or counterfeited are inserted in any clause in an Act of Parliament, something like a criminal motive or intention is implied. While foreign houses are contending so strongly for their rights on this side of the Channel, they might in their own courts do something for the English manufacturer, who has often been a great sufferer through the cleverness (or something worse) of talented French and German copyists. Whatever happens, it cannot be denied that the English Government is bound to protect the trade, and we must all keep a sharp look out for those very clever gentlemen, who imagine that, so long as there is a handsome binding, it matters not what is in the book.—*Grocer*.

A Wonderful Curiosity.

Under this heading, the Virginia newspapers have raised an excitement over a slab of curious stone, lately brought to Wheeling, Va., and put on exhibition in front of one of the stores. The editor of the *Wheeling Intelligencer* pronounces it "the most wonderful curiosity it has ever been our privilege to examine," and describes it as "a slab of common white American marble, thirty-eight inches long, seventeen inches wide, and two inches in thickness, which is as flexible as a piece of soft rubber of the same size. It was cut for and used as a hearthstone in the Moundsville Seminary Building which was destroyed by fire about three years ago. Now the question arises, what strange chemical action took place, or in what manner precisely the intense heat, to which the slab was subjected without its calcination at the time of the burning of the building, and its subsequent burial among the debris for the period above named, produced so remarkable a change in the character of the stone. This mystery no one has yet been able to answer or explain. Surely if this knowledge were given to mortals, there is no telling the amount of valuable aid that art would derive therefrom. The same chemical process, if understood, might give us flexible glass, the real value of which could never be told,

The oldest workmen in stone and marble declare that they have never before seen anything like it, and we doubt if a similar specimen was ever before discovered. In all the ruins of Chicago, nothing of the kind has been found or reported. Since the slab has been taken indoors and placed near the stove, it has daily become more and more flexible, a fact which all the more mystifies its character. We hope our scientists will give Mr. Holliday a call and see for themselves the wonderful curiosity, and that at least some one of them shall be able and willing to tell us all about the process of making a marble slab as yielding as a sheet of bonnet pasteboard."

"Yesterday," says the same editor, "several gentlemen from Pittsburgh, also two or three from Cincinnati, came to see it, and they confessed to be not less puzzled, as to the why and wherefore, than the wisest of our own citizens who have, up to this time, fruitlessly attempted to explain the process by which a slab of common white marble may be made as flexible as a piece of india rubber of the same size.

We understand that Mr. Holliday has refused an offer of \$500 for the slab, also several tempting inducements to visit other cities with the stone. We suppose he is waiting for better offers than have thus far been received."

The *Intelligencer's* book on mineralogy must have been absent from the library when the above was written. The stone is undoubtedly itacolomite, flexible slabs of which may be seen, in several college cabinets, without going to Wheeling. It is extensively developed in Stokes county, North Carolina. When cut into slabs, it might be very easily mistaken by the uninformed for marble. The itacolomite of different localities (as the Brazils and Carolinas) differs somewhat in constitution; but the flexibility in all cases is doubtless due to the disseminated laminae of talc, mica, or chlorite, which bind together the grains of quartz. A more full account of the mineral will be found in the *SCIENTIFIC AMERICAN* of April 22, 1871.

European Field Artillery and Small Arms.

If the Prussian artillery is to be regarded as the model, it possesses three features which are indispensable to its efficiency. These are loading by the breech, firing the shells by percussion, and the employment of steel in the partial if not the entire manufacture of the gun. Experience has shown that the deterioration of a bronze piece frequently commences soon after six or seven hundred rounds, and that it becomes nearly *hors de combat* when the firing is prolonged to the twelve or fifteen hundredth. Besides, the friction between bronze and lead is productive of bad results. The rifling becomes affected, and the accuracy of the shooting seriously diminished. It has been asserted on good authority that during the last continental campaign, a week's continual firing was more than sufficient to render a bronze gun perfectly useless. A material which will resist the action of the injurious friction is to be found in Krupp's steel. A Belgian gun which is constructed of that metal is enabled to be fired from six to eight thousand times without evincing any signs of weakness or damage. M. Nicaise says so, at least, to our no small surprise. There is no doubt that the French would be very much disinclined to draw upon a German establishment for a supply of steel to manufacture their cannon from, but there is no other resource unless they are prepared to make the material themselves. It is not too much to assert that a considerable time must necessarily elapse before they could rival the productions of the great workshops of Essen. Had the French guns been upon the same principle as their small arms, they would never have displayed the manifest inferiority they have done. The Chassepot is superior to the needle gun, both in accuracy of fire and length of range. But while the Prussian and Belgian guns and shells are merely enlarged imitations of the Chassepot small arm and ball, the French guns resemble equally closely the needle gun, with the additional misfortune of magnifying its disadvantages. With regard to small arms, the Belgians are better off than the Prussians, since their infantry rifle is nearly identical with the Chassepot. The principle of rifling and the length of bore of the barrel are the same, and the same similarity prevails with respect to the weight of the arm, the charge, and the shape and size of the ball. It is to be hoped, in the interests of peace and humanity, that the last continental struggle may never be repeated; but should future years cause the strife to be renewed, it is evident the French must remodel their

field artillery before they can expect to cope with their northern neighbors.—*Engineer*.

Applying Plaster to Walls and Ceilings.

The object of this invention is to provide means for utilizing plaster and other similar compositions in a more full and satisfactory manner for building purposes than heretofore. It consists in the use and manner of applying molds against the walls or ceilings, to permit the casting of the plaster or other matter to its place. This, it is claimed admits of economical application, and in more or less elaborate or artistic style, bringing the finest productions of genius to the humblest homes.

The artistic advantage of this method of applying plaster or other composition to walls or ceilings is, it is claimed, surpassed by the utilitarian benefits arising from its adoption. Building fronts can be provided with cheap and durable coatings, and wooden structures can be made fireproof by having the walls on both sides and also the ceilings lined with heavy coats of plaster or cement. The old mode of applying such substances by means of trowels, makes it very costly to use them otherwise than very thin, and to obtain nicely finished surfaces. With the aid of molds the question of greater or less thickness is only one of cost of material, and the surface finish is spontaneously obtained by the very act of application.

To cover the surface of a wall, either inside or outside, a vertical mold or false wall is used, which is placed at the requisite distance from the surface to be coated. The plaster or other composition is then, from above, poured into the space between the false and real walls until the space is entirely filled. The outer surface of the coating will, when the false wall is removed, be an exact impression of the mold. The finest wood graining, as well as moldings, carvings, etc., of most difficult make can thus be cheaply multiplied. Thus the inner or outer sides of walls can be covered in sections of greater or less extent until perfected.

On ceilings, it is proposed to use a pendent ceiling, which is supported or suspended a suitable distance under the beams or laths, according to the thickness of the plaster to be obtained. The surface of the pendent ceiling may be ornamented in suitable manner or quite plain.

The plaster is, from above, poured upon the pendent ceiling. It will adhere to the beams and laths, while the surface of the pendant is so prepared, by the application of glycerine or other material, that the plaster cannot adhere to it. The plaster may, on such ceilings, be so thickly applied as to coat the flooring beams, and thus make the floors fireproof. The application of glycerin or other material to prevent adhesion of the mold is also used for facing the walls. Mr. Andrew Derrom, of Patterson, N. J., is the inventor of this improvement.

The Sun.

A correspondent of the *Oneida Circular* says that Professor Young, of Dartmouth, in a recent lecture at New Haven upon the great luminary, imparted much interesting information. The theory which he most seemed to favor respecting the sun's constitution, he illustrated very simply thus: Put a pail of water in a room, the temperature of which is below the freezing point; the temperature of the water settles slowly till it reaches 32°, and there remains till every drop is frozen. The sun may be a vast quantity of merely gaseous matter, which is gradually liquefying, and accordingly will not change its temperature till this process is entirely accomplished; then the temperature will fall, perhaps thousands of degrees, till solidification begins, when it will again remain stationary. One authority believes the sun to be surrounded with a liquid coat already, and the sun spots are places where the surrounding metallic clouds have opened, and we see the liquid surface below it. The theory that the sun's heat is kept up by matter constantly falling into it, he doubts, arguing that, if such masses of matter existed outside of the sun, they would exert some slight influence on the surrounding planets, no evidence of which is discernible.

Speaking of iron, he said that if the word were written in great letters across the sun's face, the proof of its existence there would not be so satisfactory as that afforded by the spectrum. He pointed out lines in the spectrum made by metals which exist in the sun, though entirely unknown to us.

He gave several illustrations of the heat of the sun. If a pillar of ice covering nine square miles extended from the earth to the sun, and all the heat of the latter should be directed upon it, the whole mass would be melted in exactly one second. If an icicle forty-five miles in diameter were to be thrust into the sun with the velocity of light, say twelve million miles a minute, it could never touch the sun; it would melt as fast as it came. Still, physicists are as yet unable to determine the exact temperature, one placing it at 67,000° Fahr., another at 20,000,000° Fahr.—some difference.

How to Use a Grindstone.

1st.—Don't waste the stone by running it in water; but if you do, don't allow it to stand in water when not in use, as this will cause a soft place.

2d.—Wet the stone by dropping water on it from a pot suspended above the stone, and stop off the water when not in use.

3d.—Don't allow the stone to get out of order, but keep it perfectly round by use of gas pipe, or a hacker.

4th.—Clean off all greasy tools before sharpening, as grease or oil destroys the grit.

5th.—Observe: When you get a stone that suits your purpose, send a sample of the grit to the dealer to select by; a half ounce sample is enough: and can be sent in a letter by mail.—*Franklin Journal*.