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GARY'S MOTOR

contained in an article in the March number of Harper's tion of the force of magnetism in the invention of Mr. Gary." Magazine, can readily believe in the wonders of that division of China where the rivers run up the mountains, the moon of the fine pivots upon which the movable magnet turns, and outshines the sun, and the cats have the power of clephants. He can, moreover, add to this belief a feeling of utter contempt for scientific men. Faraday, Rumford, Joule, and or one thirtieth of an inch, and a fine adjustment is also Helmholtz have lived in vain. Their work can be demol-needed here. This is the motor which is to produce the ished by the simplest use of tenpenny nails and a few magnets combined with the use of a piece of sheet iron.

first principles of science as is contained in this article on we have taken as our text, the writer says: "To gain a large Gary's motor; it encourages men to spend time and money amount of power the inventor would place groups of comin fruitless effort, and at the same time to despise all train- pound stationary magnets above and below the beam at each ing. The allegation is made that scientific men are slower side, and the soft iron induced magnets, in this case four in than the general public to acknowledge a new step in ad- number, connected by rods passing down between the poles vance; and the discovery of the neutral line, the principle of the stationary magnets. A 'pitman' connecting the beam of Mr. Gary's motor, together with the near possibilities of with a flywheel to change the reciprocating into a rotary mothe grand discovery, are affirmed in an ex cathedra manner tion would be the means of transmitting the power. With by one whose own statements show that he has no knowledge of the subject of which he speaks.

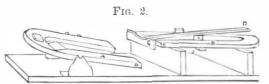
Mr. Gary's discovery of the neutral line is not a discovery. tached shingle nall across the pole or near the pole of a magchange of polarity. Mr. Gary is perfectly right in his de- even in magnetizing pieces of steel of various sizes and in fly to it; but in leaving the piece of sheet iron, the force petency for such a purpose. It is in the discussion of the the ground. It is well known that the force of magnetic at- the exuberance of his imagination, his moral courage in the nail can fall across the pole of a very strong magnet within a utter ignorance. He says, speaking of the electric light as to take advantage of the attracting force of gravitation.

Hold a horseshoe magnet in a vertical position, and move a piece of sheet iron with an attached nail to and from the poles of the magnet. It will be found that there is no neutral line where the nail drops off. Vary the experiment by substituting an iron wire for the piece of sheet iron, and with an attached nail explore the space in front and beside the poles, and it will be found that the nail shows



no evidence of a neutral line. Slip a small coil of wire along the wire or sheet iron, and connect its terminals with earth, just as we employ the force of the winds. We should a delicate galvanometer; if there is any change of polarity, be delighted if Mr. Gary has done this; and a scientific the galvanometer needle should be diverted first in one di-reputation would be within his grasp. There is no eviwire away from complete contact with the poles; no such change of deviation will be perceived.

In Fig. 2 the magnets are set in motion by vibrating, with the aid of a lever, a piece of sheet iron, so that it may "move



compass needle directly in front of one of the poles of the noted for hasty and ill-considered legislation. horseshoe magnet. The compass needle will be strongly atexerts more influence than a remoter one, which may never-infringements. theless be the stronger magnetic body. Mr. Gary experi-

Let us now consider the possibilities of the application of than an electric expression of popular will against it.

these well known facts; for it may be said, "Explain the He who credits the statements concerning Gary's motor, neutral line as you may, there is still an important applica-It is said that this little motor requires a careful adjustment particles of dust are sufficient to bring it to rest. The excursions of the so-called cut-off are limited to the one twentieth electric light and to drive locomotives across the continent. The line of argument of the inventor's friends is very strik-It would be difficult to find such utter ignorance of the ing, and deserves notice. In the article in Harper, which magnets of great size an enormous power, he claims, could be obtained in this way.'

This is the old, old fallacy; and is always stated in this There is no neutral line in the sense that the polarity changes way: "A small magnetic motor will run and produce a when Mr. Gary moves his piece of sheet iron with its at- comparatively great result, a large one will necessarily give nct. The most delicate instruments fail to detect such a is a limit beyond which one cannot pass. One can see this scription of the behavior of the nail: at a certain point it the construction of dynamo-electric machines. In regard to leaves the sheet iron and falls to the ground, simply because, the use of Mr. Gary's motor in producing the electric light by reason of its approach to the attracting pole, it tends to we have no hesitation in pronouncing upon its utter incomof gravitation acts more strongly than the force of attraction possibilities of the new motor that the writer in Harper is of the pole of the magnet, and the nail consequently falls to 'most eloquent, and we do not know which to wonder at most, traction decreases very rapidly with the distance. A small contempt of the authority of science, or the naïveté of his quarter of an inch of the pole, and yet the force of gravita- which is produced by this motor: "An enormous volume tion asserts its stronger claim and the nail will not be diverted can be secured with an expenditure of force so diminutive to the magnet. It will be noticed that Mr. Gary's models, that a caged squirrel might furnish it. With the employwhich are figured in the article in Harper, are so arranged ment of one of the smallest of the magnetic motors, power may be supplied and electricity generated at no expense beyond the cost of the machine." This statement requires no comment. The writer further says: "Professors from Harvard and from the Massachusetts Institute of Technology called, examined, and were impressed." It is true that only one professor from Harvard called, examined, and was not impressed: for the motor had just been taken to pieces and was not in a condition to run; moreover the professor does not believe that it willrun except for a short space of time. The only way that it could run would be by weakening it or using up the potential energy of the permanent magnets, and allowing the earth's magnetism to replace it. If such a toy could be made it would have great scientific interest; it would not contain the idea of perpetual motion, for it would be the employment of the magnetism of the rection, then in another, as you move the sheet iron or the dence, however, that he has really made such a toy. We have called it a toy; for as a motor it could not do any appreciable amount of work except in a romance of Jules Verne.

SENATE PATENT BILL NO. 300.—SHALL IT PASS THE HOUSE OF REPRESENTATIVES?

The term of the present Congress is rapidly drawing to a close, and little time is left for the friends of industrial progress and the rights of inventors to express their disapprobation of the obnoxious clauses of the new Patent Bill (Senate Bill 300).

We are informed, by parties whose knowledge and inon the neutral line," as the writer in Harper expresses it. tegrity cannot be questioned, that the concerted plan of This acts as a cut-off, and one of the two opposing horseshoe the promoters of the bill is to allow no further discussion magnets drops from its former position, where it was held of it, but to await a favorable moment for their scheme, and by mutual attraction. Let us see what is the cause of this rush it through during the last days of the session in the action. Place a horseshoe magnet on the table, and bring a hurry and excitement preceding adjournment-a period

We are confident that, were time enough allowed for all tracted to the neighboring pole. Now bring a thin piece of the members to become thoroughly informed in regard to iron in front of the poles of the horseshoe magnet and be- the mischievous tendency of several of its provisions, tween them and the compass needle; the latter will immedithe bill would be overwhelmingly defeated; but there would ately dip, and will have its attraction for the pole of the seem to be no time for that now. It is too late for extended horseshoe magnet diminished, not because the sheet ironacts-arguments against the impolicy of crippling-and-discouragas a cut-off for magnetism, but because the poles formed by ing the class of men who (as all parties acknowledge) have induction in the thin sheet iron are nearer the end of the been and are one of the great motive forces of national compass needle, and accordingly exert their influence. Here progress: too late for elaborate protests against the threatwe see again the effect of proximity. Magnetic action acts ened invasion of the constitutional rights of inventors, and through very short distances, and the nearest magnetic mass the disorganization of our industries by the legalizing of

But it is not too late, we trust, for an effective expresments with a box compass. The indications obtained in this sion of popular disfavor—by telegraph. Disregarding the way are apt to be very misleading, and the use of such a slow formalities of memorials and like communications by method was abandoned by scientific men more than forty mail, all who regard the inventor as more worthy of enyears ago. The friends of the new magnetic motor have only couragement and protection than the infringer, should to consult the experiments of Jamin, of Dub, and a host of promptly avail themselves of the means which invention others to discover that what are claimed to be new facts have has provided for such emergencies, and telegraph their long been known and discussed under the head of distribu- disapproval of Senate Bill 300. No member not already tion and redistribution of magnetism caused by armatures to known to be opposed to the bill should be left a moment in magnets and the presence of iron in the neighborhood of doubt as to the feeling of his constituents. The changes magnets. Abundance of time and patience to look up the which the bill would make in the spirit and the ruling of the subject will be needed, for the literature of the subject is impatent system, should it become a law, are fatal; and no surer means could be devised for preventing its passage

Hitherto the inventor has enjoyed, so far as the courts could secure it, the exclusive control of his invention which

should it become a law, we fear that there will result a dishitherto successful inventor, who says:

'One thing I have decided upon. If the law is changed, do the same.'

warned.

or underhanded action may be enormous.

and successfully upon the President. In either case use the theory that magnetism is a static force?" telegraph.

THE SAWYER-MAN ELECTRIC LIGHT.

the evening of February 20 a public exhibition of the light $\Lambda_{MERICAN}$. was given in this city by the Dynamo-Electric Light Co. We may be mistaken, but the internal evidence is extreme-Several improvements in details of construction have been ly strong that the same hand that wrote the first (possibly pansion; the lamp has also been made slightly taller. The to insinuate more than his words really implied, in regard to light exhibited was soft, pure, and steady, and susceptible the quesi-indorsement of the machine by scientific men, of perfect regulation. Any lamp in the circuit could be raises the suspicion that the writer may not have been so turned up or down, from a dull glow to brilliant incandes- thoroughly deluded as he seems. Be that as it may, THE thrashing, it would seem to be quite feasible to separate the cence without affecting the rest. An important improve- Scientific American is in position to say that the assertions ment has also been made in the switch.

one previously employed; there were more lights in the cir- "professors from Harvard and from the Massachusetts Incuit, and the illumination was more brilliant and satisfac- stitute of Technology called, examined, and were impressed' tory. Comparison was made with gas light, and also with is not true; that apparatus constructed according to the the voltaic arc, clearly demonstrating the superiority of light drawings in Harper's will not do what the writer says they used in the Sawyer-Man lamp are now proved to be compa- to be classed with the Keeley motor and like contrivances. ratively indestructible. If, however, the lamp should be It is very much to be regretted that the editors of periodibeen feasible. With the power at command the indications dence. are that the production of light by this system will range between one-fifth and one-half the cost of gas.

A NEW FORM OF CARBON.

ber, mention was made of the peculiar carbons employed, to result in disappointment and loss. the manner of their production being a secret which Mr. Sawyer did not choose at that time to disclose.

We have now been favored with an exhibition of the pro-

hard deposit of carbon rapidly forms as the hydrocarbon is nomena of the entire continent. decomposed by the heated pencil.

Life Saving Mattresses.

The Navy Department has been experimenting with a to be favorable. The mattress is filled with cotton, but the depends on the fertilizing influence of the American forests. sand, and thus the jetties be greatly strengthened. process of preparation to which the cotton has been subjected. If they are gone we shall have on earth no newer world to makes it impervious to water for many hours, and renders it hope for—no future Columbus can alleviate the struggle for capable of sustaining a heavy weight—that of a man without existence. To stay such a catastrophe the author suggests against the classification of the oriole among mischievous any difficulty. It possesses other properties which, it is that in every township, where the disappearance of arboreal birds. He says that he has frequently seen them tear open claimed, make it a most comfortable bed; the cotton being vegetation begins to affect the perennial springs and water the nests of apple worms and devour them, and thinks that and proof against vermin of every kind.

THE GARY MAGNETIC-MOTOR DECEPTION.

the Constitution guarantees. His patent has been regarded printed a column letter from Boston describing, as a fact nant of the primeval forests has survived, let the woods on in the courts as presumptive evidence that his claim to the accomplished, a magnetic motor which was to supersede the upper ridges or on the summit of isolated hills be spared invention covered was a just claim. Under the proposed steam; a contrivance which produced motion "by no ex- by mutual agreement of the proprietors. In the treeless reamendments of the law, all this will be reversed. The paternal agency, simply from the magnetic power of the magnetic power of the great West not only amateur societies, but every tentee's right will be burdened by needless penalties in the chine." It was a great discovery, sure to revolutionize the grange and farmers' union of every county, should devote shape of heavy fees, and laid open to invasion by any one world. There was a lot of talk about polarity, magnetism, themselves to the work of tree culture; and every landed who chooses to infringe it. And when his case is brought "the neutral line," and the usual story of humble genius proprietor should see to it that the boundaries of his estates into court the inventor, not the infringer, will be treated as upsetting all the established laws of science. The inventor Every inventor feels that the bill is aimed against him; and the books; "had I studied or read books," he said, "I should never have experimented, as the books told that what I was pied nor absolutely barren; and be sure that their influence astrous fulfillment of the prediction of a hard-working and after was an impossibility, that there was no such thing;" but he kept on—and got it!

so as to lessen my rights as an inventor, I am through, I justify the Scientific American in noticing them until these precautions should be generally adopted, would soon quit the field, and thousands of others will be compelled to they become obtrusive. Toward the middle of December, be so unmistakably distinguished by the unfailing humidity The country cannot afford to have such men quit the field. Gary Magnetic-Motor was about to startle the world by pro-that the sheer necessity of competition would induce back-Policy, as well as justice, forbids any measure tending to ducing the electric light out of-nothing. In the words of ward neighbors to try the same experiment; and before long compel them to quit the field; and the members of the lower the writer: "By the simplest of devices, which he ex- the maxim would not only be generally recognized, but house should not be left to enact the proposed wrong un- hibited to me to-day, Mr. Gary utilizes his own newly dis- generally acted upon, that husbandry and tree culture are covered principle in such a way as to generate electricity inseparable. Let every citizen, who has the great question of justice for the light at absolutely no expense beyond the cost of the and wise policy at heart, use the telegraph freely, and en- machine, which itself is automatic." After listening to a precourage his friends to do likewise. The cost will not be tended description of the working of the machine, the Times great, while the good that may be done in preventing hasty writer remarked to Mr. Gary: "Your new invention, then, is simply a practical application of the principle, which you In case our suggestion arrives too late, or the telegraphed have discovered, of the existence of the neutral line, at the advice fails to stay the passage of the bill, then by the same point of the magnetic field where the polarity changes, and means the popular will might be brought to bear directly which is antagonistic to the heretofore universally accepted

> "Precisely," was the reply. "It is only on this principle that the thing is possible."

In its March issue, Harper's Monthly Magazine comes to It will be remembered that in our issue of December 7th, the aid of the Times, by printing without comment, as a 1878, we gave illustrations of this novel and promising form regular article, a long and cleverly written account of of electrical apparatus. Since that date the inventors have "Gary's Magnetic Motor," with several illustrations, which been busy with endeavors to perfect the invention, and on will be found on another page in this issue of the Scientific

made, but no radical changes. The chief improvement is also the second) Times article, also wrote the account in in the bearing of the upper carbon holder, to allow for ex- Harper's. It was shrewdly done; and the manifest attempt in regard to the exhibition of the Gary motor in motion by The dynamo machine used was about half the size of the self-generated force are not true; that the assertion that can overcome the difficulty by some cheaper means than the by electric incandescence for ordinary uses. The carbons will do; in short, that the pretended motor is a deception,

broken or otherwise injured by accident, it can be as easily cals so worthy of esteem as the New York Times and Harand cheaply removed and repaired as an ordinary gas-burner. per's Magazine should give place to such assertions, unsup-As regards economy, tests upon a large scale have not yet ported by the most positive, competent, and conclusive evi-

The world is full of snares for capitalists, always prompt to snatch at delusive promises of sudden profit; and the fact that worth a year. At this rate it would not take many years to the pretensions of the Gary motor have been accepted without a question by a magazine like Harper's may be the means In describing the Sawyer-Man electric light, last Decem- of inducing many to put money into projects that are sure the erection of houses upon which less than 5 per cent of the

THE PRESERVATION OF FORESTS.

cess, and a very pretty experiment it makes. The carbons Review, Felix L. Oswald, after reviewing the disastrous effects ance, a proportional sum should be expended upon means in question are about half an inch long, with the diameter of which have followed the wholesale destruction of forests in for preventing fires, or upon appliances for securing the one-sixteenth of an inch. Their color is steel-gray, and the various countries of the world, remarks that since the year prompt extinction of such as might be started. If preventsurface is hard as steel; within the carbon is tolerably soft. 1835 the forest area of the western hemisphere has decreased live measures were thus made imperative for a decade or so, In his earlier experiments Mr. Sawyer employed as the at the average yearly rate of 7,600,000 acres, or about 11,400 the country would soon be able to save a considerable porsource of incandescence slender pencils of gas retort carbon square miles; in the United States alone this rate has ad. tion of the \$100,000,000 a year now directly or indirectly in an atmosphere of illuminating gas. The carbons were vanced from 1,600 square miles in 1835 to 7,000 in 1855, sacrificed to the "fire fiend"—an item certainly worth takslowly destroyed, but at the same time they took on a super- and 8,400 in 1876. Between 1750 and 1835 the total aggre. ing account of. ficial deposit, evidently of carbon, but unlike in luster and gate of forests felled in South and Central America (espehardness any carbon that Mr. Sawyer had seen. Inferring cially in Southeastern Mexico), and in the Eastern, Souththat a more rapid deposit would be made in a denser hydro- eastern, and Southwestern States of our republic, may be carbon, Mr. Sawyer experimented with a great variety of estimated at from 45,000,000 to 50,000,000 acres. In other of the Mississippi used to threaten all sorts of disaster to such liquids, finding elive oil most satisfactory. His method words, we have been wasting the moisture supply of the that work by storms. There are indications now that storms is simply to heat the carbon to an extremely high temper- American soil at the average ratio of seven per cent for each may in reality act as an efficient co-operator and ally to Eads. ature, by passing through it an electric current, while it is quarter of a century during the last one hundred and twenty. During the severe storms of January a ridge of sand was immersed in the oil. The best results are obtained by the five years, and are now fast approaching the limit beyond raised some feet above high water mark, and half a mile use of a pencil of willow charcoal, upon which an intensely which any further decrease will affect the climatic phelong, across the jetties at an angle of 45°, about 100 yards

should be appropriated for a "township grove," an oasis to ought to be fostered rather than destroyed.

be consecrated for ever to shade trees, birds' nests, picnics, In the latter part of November last the New York Times and playing children. In all new settlements, where a rembe set with shade trees, and that wooden fences be sup had not been a student; knew nothing of philosophy from planted by quickset hedges. Let fruit trees be planted wherever there is a piece of ground neither otherwise occuon the atmosphere in summer and their fertilizing leaves in fall will more than indemnify the adjoining fields for the The world is too full of perpetual motion mongers to modicum of sunlight they may intercept. Any State where the Times gave another lift to the deception. This time the and freshness of its fields and the abundance of its crops,

THE TROUBLE WITH WIRE BINDERS,

So far as their utility at harvest time is concerned the self-binding machines cover one of the greatest improvements of the time. Their immediate money advantage is estimated as high as 20 cents on each bushel of wheat grown. The presence of bits of wire in the wheat when it reaches the mill is, however, a serious offset to the gain by automatic binding. The wire injures the stones, is liable to strike fire and explode the mill, cuts the bolting cloths, and is otherwise so mischievous that many millers have protested against wire bindings, and threaten to retaliate with special charges for grinding wire bound wheat.

It has been the practice of farmers to run wire and all through the thrashing machines. So long as the wire is bright and tough no harm is done; but if the wire is rusted and brittle, fragments remain with the grain, and serious trouble may result.

The conditions seem to call for a new invention, an attachment to the thrashing machine which shall cut the wire binding and remove it while the straw passes on to the thrasher. The work of removing the wire would seem to be nowhere near so difficult as the original task of putting it on the sheaf. If rusted wire cannot be entirely removed before bits of iron that remain in the wheat by a train of magnets in the cleaner. In either case we are sure that our inventors abandonment of automatic binders.

THE WASTE OF FIRE.

During the past year, without the occurrence of any remarkable fires, it has cost the United States about \$200,000 a day to furnish employment to our town and city fire departments. What the fire departments cost we do not know; it is a good round sumat the least calculation. Architects say that 10 or 15 per cent of the cost of any building, properly expended, will make it practically fireproof. Our daily fire losses would therefore fireproof from \$1,000,000 to \$2,000,000 worth of new structures a day, or upwards of \$300,000,000 reduce the daily fire losses to comparative insignificance.

It might not be a bad thing to forbid in towns and cities total cost should be devoted to approved plans for preventing the spread of fire. In view also of the increased indifference to fire risks incident to fire insurance, it might be In an article with the above title in the North American good policy to require that, for every dollar spent for insur-

Neptune Favors Eads.

The opponents of Capt. Eads' jetty system at the mouth back of the wing dams. Though broken in two by the jet-If we consider how the agricultural products of the eastern ties the ridge continues throughout of the same height and continents become from year to year more inadequate to the thickness. Captain Brown, who has charge of the works wants of their still growing population, we may foresee the at Eadsport, says if the ridge remains as at present the time when the hope of the world will depend on the pro-triangles formed by it on either side of the jetties—the one mattress designed for use on vessels at sea, with results said ductiveness of the American soil; but that productiveness being acute and the other obtuse—will eventually fill up with

A correspondent, writing from Guilford, Conn., protests free from all oils and impurities, not liable to knot or pack, courses or the fertility of the fields, a space of say 50 acres, birds with pluck enough to destroy such disagreeable pests