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Explosions from Combustible Dust. By Prof. L. W. PECK. ure before the Millers of Minneapolis. Combustion and E recisely the same theorem. A Lecly the same phenomenon. Experiments on the Explosion ly the same phenomenon. Experiments on the Explosion of Starch, and Mill Dust. The Dynamic Energy of Mill Dust. 4

s. rrard-Parfaite's Improved Wool ('arding Machine. 2 engravings sibilities in Gas Lighting.—Beet-Root Photographs.

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 outshines the sun, and the cats have the power of clephants. Hc can, moreover, add to this belief a feeling of utter conished by the simplest use of tenpenny nails and a few magnets combined with the use of a piece of sheet iron.

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.

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 wire away from complete contact with the poles; no such change of deviation will be perceived.

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





on the neutral line," as the writer in Harper expresses it. This acts as a cut-off, and one of the two opposing horseshoe 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 at-

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 of China where the rivers run up the mountains, the moon of the fine pivots upon which the movable magnet turns, and particles of dust are sufficient to bring it to rest. The excursions of the so-called cut-off are limited to the one twenticth tempt 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 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 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 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 tached shingle nall across the pole or near the pole of a mag- a corresponding increase of power." This is not true; there nct. The most delicate instruments fail to detect such a is a limit beyond which one cannot pass. One can see this change of polarity. Mr. Gary is perfectly right in his de- even in magnetizing pieces of steel of various sizes and in 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 incomfly to it; but in leaving the piece of sheet iron, the force petency for such a purpose. It is in the discussion of the of 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, the ground. It is well known that the force of magnetic at- the exuberance of his imagination, his moral courage in the traction decreases very rapidly with the distance. A small contempt of the authority of science, or the naïveté of his nail can fall across the pole of a very strong magnet within a utter ignorance. He says, speaking of the electric light 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 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 evirection, 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 apprecia-

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

ble amount of work except in a romance of Jules Verne.

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 integrity cannot be questioned, that the concerted plan of 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 immedi- the 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 iron acts 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 exerts more influence than a remoter one, which may never- infringements. But it is not too late, we trust, for an effective exprestheless be the stronger magnetic body. Mr. Gary experiments 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 im- patent system, should it become a law, are fatal; and no surer means could be devised for preventing its passage mense

Fig. 1.

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- Possibilities in Gas Lighting.—Beet-Root Photographs.
 IV. ELECTRICITY, LIGHT, HEAT, ETC.—A Few Experiments with the Induction Coll. By GEO. M. HOPKINS. With Hafgures. Path of the electric spark intermica. Electric discharge over mica. Experiments with a Rotating Disk; the Leyden jar: and a Pulminating Pane. Gas Platol. Stateham's Fuse. A series of simple and brilliant experiments. Apparatus for Decomposing Water. Numerous forms of Geissler's Tubes. Gassiot's cascade. Electric eggs.—A Simple Electric Pen. 1 figure.— Autographic Telegraphy. M. D'Arlincourt's Apparatus. 1 igure.— / engraving
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VII. MISCELLANEOUS.-A Nut for Congress to Crack. By P. H. WAIT. -Effect of Ocean Currents.

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