

[For the Scientific American.]

THE NATURE OF THE NEWLY DISCOVERED FORCE.

BY GEORGE M. BEARD, M. D.

In my letters to the Tribune and in my lecture before the Polytechnic Club, I advanced a theory of the force recently discovered by Mr. Edison, that might perhaps ally it to electricity, though not to any known form, and account for its non-polarity and other phenomena exhibited by it.

When the wire conducting the force from the battery to the dark box is divided in the air, and the ends are separated even a sixteenth of an inch, no spark appears in the dark box. Lay these ends of the wire on a semi-conductor, as wood, and the force will pass when they are separated a moderate distance.

Phenomena of the kind here described suggest magnetism more than induction or dynamical electricity: but this force does not respond to the test of magnetism, the power to attract iron; and moreover it exhibits phenomena that do not belong to magnetism.

The points which favor the radiant theory of this force may be thus recapitulated: 1. It does not respond to any of the physical tests of electricity, except the spark.

- 2. It produces no perceptible or demonstrable physiological effects, like electricity.
3. It is not resisted by non-conductors as air, water, glass, rubber, and paraffin, to the same degree as electricity.
4. It gives no evidence, in any of its phenomena, of polarity.
5. It passes through non-conductors, as air, rubber, glass, etc., most readily by large surfaces at the terminals, while electricity prefers to pass by points.
6. It diminishes in strength with the distance from the battery, possibly in some definite ratio, although that is not yet demonstrated.

Any form of electricity giving a spark like the spark of this force would respond to some of the physical tests of electricity, would produce readily perceptible physiological effects, would be powerfully resisted by the air, and would in all its phenomena suggest polarity, even if rapidly reversed.

Again, the four facts regarded by me as favoring the theory that this force is allied to electricity, are, when severely analyzed, not so convincing as they might at first appear. The spark of this force resembles the spark of dynamical electricity; but so also does the spark produced by combustion.

If it be, as I have suggested, a kind of electricity which, after the manner of the shuttle, returns to its source by rapid forward and backward movements, it would yet be electricity under very different conditions from those under which we are wont to consider it, and would be practically a new force.

The above would represent Mr. Edison's theory of a radiant force, nearer to light and heat than to magnetism or electricity.

The theory I have suggested would bring the force nearer to magnetism and electricity than to light or heat, as follows: Light, Heat New Force . . . Magnetism, Electricity.

The discovery that broad surfaces at the terminals are ne-

cessary to conduct this force through non-conducting solid bodies, as glass, rubber, paraffin, etc., was made but a few nights ago. That the force passed through air when large surfaces were at the terminals had been proved previously by Mr. Edison's experiments and by my own.

Useful Recipes for the Shop, the Household, and the Farm.

A new compound for polishing and cleaning metals is composed of 1 oz. carbonate of ammonia dissolved in 4 ozs. water; with this is mixed 16 ozs. Paris white. A moistened sponge is dipped in the powder, and rubbed lightly over the surface of the metal, after which the powder is dusted off, leaving a fine brilliant luster.

A new alloy for bell metal is proposed, which does not tarnish, is less liable to crack, gives a better sound, and is much lighter in weight than the alloy usually employed for the purpose. It is prepared as follows: Nickel 1 lb. and copper 6 lbs. are melted and cooled. Add zinc 2 lbs., aluminum 1/2 oz. Melt and cool. Melt again, and finally add 1/2 oz. quick-silver and 6 lbs. melted copper.

A very beautiful application of electro-metallurgy is to apply a coat of silver by electro deposition on natural leaves and flowers. By this means very delicate ornaments are produced, since the precise form and texture of the natural leaf are produced under the thin silver film.

Lemons can be preserved by varnishing them with a solution of shellac in alcohol. The skin of shellac formed is easily removed by rubbing the fruit in the hands.

J. Q. R. B. says: Varnish made with alcohol will get dull and spongy by the evaporation of the alcohol, which leaves water in the varnish, as all commercial alcohol contains water. Take thin sheet gelatin, cut it in strips, and put it in the varnish; it will absorb most of the water, and the varnish can be used clear and bright till the last drop.

There is no simpler remedy for preventing cider growing sour than mustard seed. After the cider has fermented and reached the desired palatable condition, put 1 pint mustard seed to a barrel of cider, and bung tight.

DECISIONS OF THE COURTS.

United States Circuit Court-- District of New Jersey. PATENT SKATES.--GEORGE B. TURRELL vs. EDWARD SPAETH AND CHARLES GUELICKER.

[In equity--Before Nixon, J.] NIXON, J.: This suit is for the infringement of reissued letters patent, dated April 6, 1875, for "Improvement in Skates," of which the complainant became the owner by assignment on the 18th of April, 1875.

The complainant is taking testimony to prove his prima facie case, and has issued a subpoena duces tecum to one of the defendants, Edward Spaeth, requiring him to produce before the Examiner all "books, papers, and documents whatsoever, that will show the number of skates made or delivered by the defendants, since the 8th day of April, 1875."

The counsel for the complainant justifies the questions propounded, and the call for the books, exhibiting the amount and character of the business of the defendants since the filing of the bill, on the ground that the complainant's patent is for a combination; that it already appears in evidence that the defendants have a contract to manufacture the skates, which are sworn to be an infringement of the complainant's patent, and to deliver them to persons who are not licensees of the patentee; that a number of such skates are yet to be made and delivered under said contract; that it further appears that the defendants are accustomed to make large quantities of the parts of skates interchangeable, and to put them together afterward; that it is admitted in their testimony that some of these parts were manufactured before the commencement of the suit; and the object of the present inquiry is to ascertain whether the other parts of the skates have not been manufactured since, and whether the parts made before filing the bill have not since been united to form skates so that what was done after the commencement of the suit has been contradictory to the infringement.

The reissued patent owned by the complainant, and for the infringement of which the suit is brought, is undoubtedly for a combination in the specifications. The inventor states that the nature of his invention consists in the combination, with a skate and the lateral-acting clamps, of mechanism that operates to move the clamps toward each other with sufficient force to cause them to grasp the sole, and hold the skate to the boot or shoe. The combination, in a skate, of clamps for grasping the sole, a plate or rest for the foot, and mechanism for moving and holding the clamps. The second is for-- The clamps for grasping the heel and the clamps for grasping the sole, combined with mechanism operating and holding both sets of clamps, substantially as specified. And the law is well settled that such a patent is not infringed by the use of some of the parts which make up the combination, the other parts being omitted, unless the place of the discarded constituents is supplied by something substantially equivalent.

of the plaintiff's combination, without substituting any other, he does not infringe; and if he substitutes another in the place of the one omitted, which is new or which performs a substantially different function, or if it is old, but was not known at the date of the plaintiff's invention as a proper substitute for the omitted ingredient, then he does not infringe.

Q. 23. Do you keep books of account which show how many skates like Exhibit No. 1, you make, the deliveries of such skates, and the dates of such deliveries? A. Yes. Q. 24. Will you produce those books of account at the next adjournment? (Objected to, because complainant has no right to compel the witness to produce his books at this stage of the suit, and because he has not served any subpoena duces tecum upon him, and he has no right to such subpoena.)

Q. 25. In manufacturing skates under your contract, has it been your practice to make considerable numbers of each of the different parts of the skates, and keep them until such time as you may desire to put them together? A. We always have made those parts at the commencement of the year, as that is work we keep boys on to fill up time when we are doing nothing else.

Q. 26. During the period of time between the reissue of the patent and the filing of the bill, did you have on hand a considerable number of each of the parts constituting the clamping mechanism like that in Exhibit No. 1? A. Yes; we always do have such parts in the factory. Q. 27. Since that time, have you used any of the parts that you then had in store in the construction of skates substantially like complainant's Exhibit No. 1? (Objected to as immaterial and irrelevant to any issue in this suit; and because the question ought to be limited to the time of the commencement of this suit, and counsel instructs witness not to state what he has done since that time.)

Q. 28. Each is liable for all the damages. Without thereby intending to intimate an ultimate opinion in regard to its relevancy to the pending one, I propose to adopt its spirit in the order which I shall make on the present motion. Let the subpoena duces tecum be modified as the defendant requests, by inserting the clause "and until the commencement of this suit" after the words "8th day of April, 1875;" but at the same time let the defendant, and any other witness, answer question 27, and all other questions tending to show the substantial use of any of the parts of skates like Exhibit No. 1, which defendant had on hand when the suit was commenced.

[Charles F. Blake for complainant. J. Van Santvoord, for defendants.]

NEW BOOKS AND PUBLICATIONS.

TINNITUS AURIUM, OR NOISES IN THE EARS. By Laurence Turnbull, Ph. G., M.D., Physician to the Eye and Ear Department of the Howard Hospital, Philadelphia, Pa., etc. Second Edition, with Cases. Philadelphia, Pa.: J. B. Lippincott & Co.

Dr. Turnbull sends us a very readable and interesting pamphlet on a very common and little understood malady. He shows that noises in the ears are the effects of causes widely different, and that sometimes the sounds are merely hallucinations, produced by abnormal action of the cerebral organs.

BRIDGES AND TUNNEL CENTERS. By John B. McMaster. Price 50 cents. New York city: D. Van Nostrand, 23 Murray street. SAFETY VALVES. By R. H. Buel, C. E. Price 50 cents. New York city: D. Van Nostrand, 23 Murray street.

These two excellent volumes are Nos. 20 and 21 of Mr. Van Nostrand's Science Series. The work on safety valves is especially commendable for its clearness and accuracy, and such a work, judging from our multitudinous correspondence, has long been needed in our workshops and factories.

ADVENTURES OF A DEAF MUTE. By W. B. Swett. Marblehead, Mass.: Published by the Author.

An interesting and well written account of some journeys and adventures in the White Mountains, the profits from the sale of which are devoted by the author to the benefit of his brethren in affliction.

THE ORIGIN OF LIFE AND SPECIES, a New Theory. By J. B. Pool. Price 10 cents. Pittsfield, Mass.: W. H. Phillips.

The author of this pamphlet deserves credit for courage in attacking a very large subject, and for the clearness with which he states his views.

THE GROCER. Volume I, No. 1. Published Weekly. Subscription \$2 a year. New York city: The Grocer Publishing Company, 163 Chambers street.

A valuable and well edited trade journal, replete with accurate information and original articles.

THE ILLUSTRATED ANNUAL REGISTER OF RURAL AFFAIRS FOR 1876. With 170 Engravings. Price 80 cents. Albany, N. Y.: Luther Tucker and Son.

An excellent handbook of agricultural and gardening matters, accompanied by a calendar and much useful information.

AURORA BRAZILEIRA is the name of a new monthly scientific and mechanical periodical, published in the Portuguese language by Mr. J. C. Alves Lima, at Syracuse, N. Y. The journal is intended principally for Brazilian circulation, and as a medium for trade between the United States and the Portuguese-speaking population of South America.

Inventions Patented in England by Americans.

- (Compiled from the Commissioners of Patents' Journal.) From December 3 to December 16, 1875, inclusive.
ARTIFICIAL LEATHER.--A. W. Pope (of Boston, Mass.), London, Eng.
BOOT SEWING MACHINE.--D. Mills (of Brooklyn, N. Y.), Aston, Eng.
BUILDING SHIPS.--T. H. Buckler, Baltimore, Md.
CHECK FOR FIRE ARMS.--W. D. Miller, Pittsburgh, Pa.
CLOTHES HORSE, ETC.--C. T. Rowe, Brooklyn, N. Y.
GRINDING BARK.--S. R. Thompson et al., Portsmouth, N. H.
LOCK NUT, ETC.--P. M. F. Cain, Colorado.
METAL CAR FRAME, ETC.--B. J. La Mothe, New York city.
ORE-ROASTING FURNACE.--R. M. Fryer, New York city.
PREPARING PAPER FOR PRINTING.--R. M. Hoe, New York city.
REPEATING FIRE ARM.--B. B. Hotchkiss, Paris, France.
SHIP'S TABLE.--E. P. S. Andrews, Havilah, Cal.