

**Improved Telegraph Instrument.**

The apparatus which we herewith illustrate is a combination of three distinct inventions, upon each of which a separate patent has been granted; viz., the magnet, the sounder, and the key. They, together, constitute one of the most beautiful and efficient instruments of its class we have had brought to our notice. We will notice the parts of the device in the order above specified.

The wire has, previous to this invention, been wound entirely around one spool, after which it was carried to the other, which was wound in like manner; the current consequently passed through the entire coil on one spool before reaching the other.

In this new system of applying the wire, both spools receive the current simultaneously; the current passing alternately from one to the other. Greater power and quicker action are, therefore, secured by a battery of a power which, under the old system, would almost be insufficient to work the instrument.

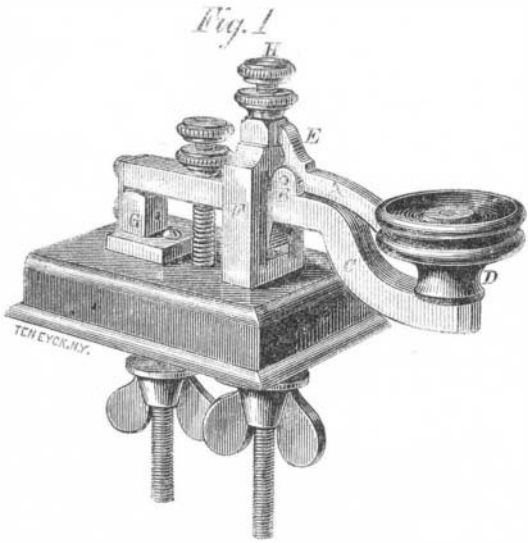
These advantages are secured by winding both spools at once. The spools are placed with their heads together, and the wire being started at the outer end of one spool is wound in a single layer over that spool, crossed over the heads of both spools, which are placed together, then wound over the second spool, and back, crossed over the heads again and wound over the first spool and back, again crossed over the heads, and so on until both spools are filled. In this way many connections are made between the two coils, and the wire, instead of being wound continuously on each spool separately, is equally distributed between both.

The spools thus wound are set up in the ordinary manner.

When the electric current is passed through the coils, it passes simultaneously around both spools, and both, therefore, act at once to attract the armature, instead of, as heretofore, one after the other. The action is thus rendered more sudden and powerful than in the method of winding, as heretofore practiced.

It is scarcely necessary to add that this method is equally applicable to all kinds of electro-magnets for whatever purpose they may be employed, and whether spools, cores, or legs are used.

The principal differences between the key, Fig. 1, and those in ordinary use are, first, the addition of a supplementary lever, A, pivoted to the principal lever, C, at B, the use of which is to make an indirect circuit while the instrument is not in use; and, second, the insulation of the point of the adjusting screw, H, which limits the motion of the principal lever, C. A hard-rubber knob, D, on the principal lever, C, is



separated by a coiled spring from a button of similar material on the supplementary lever, A. The latter has a foot, E, which rests against the standard, F, when the instrument is not in use, the points of contact being made of platinum. The current then passing through the standard, F, passes through E, and thence through C, and the spring attached to the standard, G, and so out through the wire. In use the knob, D, and the button on the supplementary lever, A, are pressed together, which breaks the indirect current, and the direct circuit, is then made and broken in the usual manner by bringing together a platinum point on the under side of the principal lever, and a similar point on the bottom of the slot in the standard, F, or vice versa, as the key is depressed or elevated.

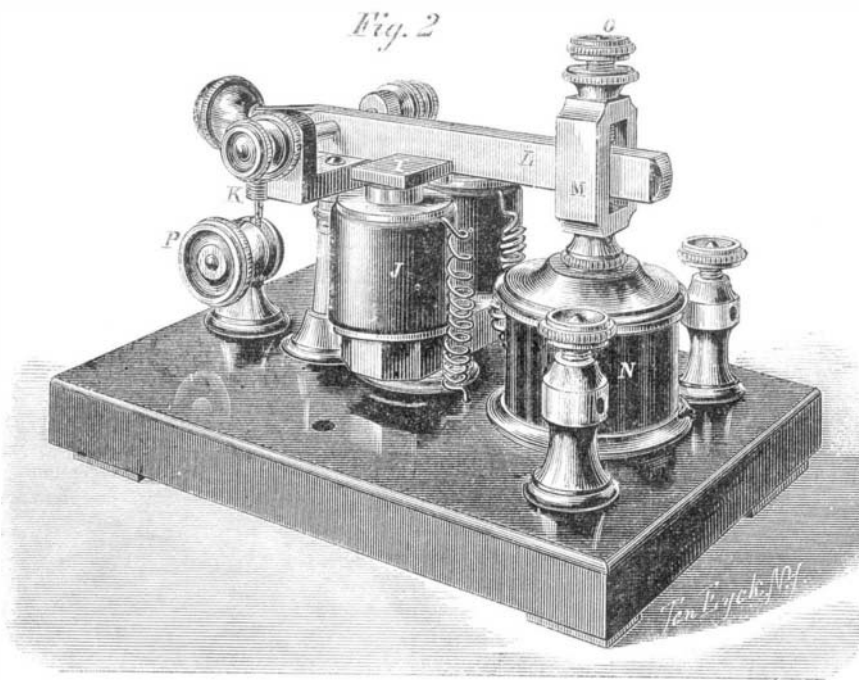
The insulation of the point of the adjusting screw, H, is necessary to prevent the current from passing through it from the standard, F, to the principal lever, C. The sides of the slot in the standard, F, are also insulated by plates of hard rubber, to prevent any danger of making the circuit by accidental contact of the lever, C, with them.

This device, therefore, it will be seen, closes the circuit automatically when not in use.

Fig. 2 represents a combination of an electro-magnet with coils formed as above described, with an improved sounding column.

The armature, I, being alternately attracted to the magnet,

J, and withdrawn by the action of the spring, K, through the sounding bar, L, strikes L upon the end of a steel bolt, not shown in the engraving, which passes down through the bottom of the standard, M, and through the center of the hollow hard-rubber cylinder, N. This hollow rubber cylinder is surmounted by a brass cap, and rests on a brass ring, which, in its turn rests on the rosewood stand of the instrument, the whole being firmly held by a nut screwed on the lower end of the central steel bolt. Around this nut are bored sound-holes which communicate from the bottom of the rosewood stand with the interior of the hollow hard-rubber cylinder, N. This cylinder reinforces the sound made by the impact of the sounding bar, L, upon the central steel bolt above described, in a remarkable manner, making it very distinct and

**DAVIS' SOUNDING INSTRUMENT.**

clear; the sound waves formed in the interior of the hard-rubber cylinder, N, communicating freely with the external air, through the holes at the bottom of the stand above described. A screw, O, limits the motion of the sounding bar, L, and a winding pin, P, in a double-slotted post, serves to regulate the tension of the coiled spring, K.

The construction of this instrument involves some nice scientific principles, which cannot fail to attract the attention of electricians and practical telegraph operators.

The patents for the three parts of this instrument we have thus described were taken out through the Scientific American Patent Agency; the one on the electro-magnet bearing date Nov. 9, 1869, and the patents on the key and sounding column July 6, 1869. The patentee is Mr. William Edward Davis, of 319 Newark avenue, Jersey City, N. J., where address him for further particulars.

**REDUCE THE COST OF PATENTS.**

We publish elsewhere an extract from the Report of the Secretary of the Interior, giving a brief *resumé* of the operations of the Patent Office for the past year.

The financial result appears to be gratifying. The applications have been very numerous, and the fees, in excess of expenditures some \$213,920. The Secretary proposes to use this surplus in printing copies of the drawings—a suggestion which is very good so far as it goes; but we should have experienced additional pleasure if the Secretary had urged upon Congress the importance of reducing the patent fee. The Patent Office is a self-sustaining institution, and can be kept so by a judicious administration of its affairs and upon a reduced scale of fees. We should say that \$25 were amply sufficient—\$10 payable in advance, and the balance, \$15, upon the allowance of the claims. We hope Commissioner Fisher, in his Annual Report, will take hold of this matter and urge a reduction of the costs of granting patents.

**Patent Office Affairs.**

The report of the Secretary of the Interior furnishes the following interesting facts concerning the Patent Office:

Application for Patents.....	19,360
Caveats filed.....	3,636
Applications for extension.....	153
Patents issued.....	13,762
Patents extended.....	125
Patents allowed, not issued.....	899
Balance appropriation on hand Oct. 1, 1868.....	\$117,249-18
Appropriation since made.....	722,018-00

Total.....	\$839,267-18
Expenditures since Oct. 1, 1868.....	\$472,432-62
Balance on hand.....	416,804-53
Fees in excess of expenditures.....	213,926-02
Expenditures in excess of fees, 1868.....	171-64
Appropriation asked for.....	564,420-00

The office now publishes a weekly list of claims, which is furnished to subscribers at \$5 per annum. It is believed that by the raising year the receipts will cover the entire cost of the work. This list, published simultaneously with the issue of the patents, serves all the purposes of the annual report, which is not issued until two years later.

In order that the public and the examining corps may have access to the drawings of the Office, I recommend an appropriation for printing copies. The expense so occasioned can be reimbursed, if the Commissioner be authorized to make sale of them, and apply so much of the proceeds thereof as

may be necessary. If he could sell copies of the patents and of the drawings at cheap rates to those who desire them, and place copies in the State capitals and great commercial centers, more complete information of the action of the bureau than is now furnished by the report would be promptly disseminated, and an annual expenditure of \$200,000 of the public money avoided.

My immediate predecessor, in each of his annual reports, urged the repeal of all laws which authorized an appeal from the decision of the Commissioner of Patents on applications for letters patent and in interference cases. The reasons he presented are, in my opinion, clear and unanswerable. It is, indeed, believed that it was the intention of Congress to abolish such an appeal by the act of 1861. No mention is made of it in the provision for appeals, or in the new schedule of fees thereby established. It has, however, been held that prior acts which authorized such an appeal are still in force, and that the right thereto still exists. If their purpose was to secure uniformity in the administration of the patent laws, it has signally failed. The appellants may select either of the four members of the Supreme Court of the District to hear and determine the case, and from his decision no appeal lies to the court in banc.

The Commissioner, in a paper addressed to me, represents that, as a natural consequence of the appeal and of the fee claimed for acting upon it, the judges have, without authority from Congress, assumed to extend their jurisdiction to his purely ministerial duties, and to interfere with the discharge of them. Decisions have been made on the proper date of letters patent, the allowance of amendments, the issue of double patents to an inventor and his assignee, and on other questions of a like character. The practical working of this asserted supervisory control over the doings of the Commissioner has been, upon the whole, injurious. Consistency of decisions and of administration has not been attained. Controversies and litigation as to the extent of relative jurisdiction have arisen, and the usefulness of the Office, in its attempts to protect the public against imposition has been essentially impaired.

**Sheepskin Mats.**

A correspondent of *The Country Gentleman* gives the following directions for making beautiful sheepskin mats, the recipe being for two skins.

"Make strong soapsuds, using hot water, and let it stand till cold, then wash the skins in it, carefully squeezing out all the dirt from among the wool, then wash them in cold water till all the soap is out. Next dissolve half a pound each of salt and alum in a little hot water, and put into a tub of cold water sufficient to cover the skins and let them soak twelve hours, then hang over a pole to drain. When well drained, stretch carefully on a board to dry. Stretch several times while drying. Before they get entirely dry, sprinkle on the flesh side one ounce each of finely pulverized alum and saltpeter rubbing it in well; then lay the flesh sides together and hang in the shade for two or three days, turning them over every day till perfectly dry.

"Finish by scraping the flesh side with a blunt knife, to remove any remaining scraps of flesh, and then rub the flesh side with pumice or rotten stone and the hands. Very beautiful mittens can be made of lamb skins tanned as above."

**The Genesis.**

Professor Agassiz denies that he, as has been publicly charged, recently opened a lecture with the statement that he wanted no one to listen to his lectures who believed in the first chapter of "Genesis." This charge bears on its face the evidence of its falsity, yet Professor Agassiz deems it worthy of notice. He says in a letter to a friend:

"I am little in the habit of noticing things of this kind, being convinced that often it is useless, and having become from long habit somewhat callous to misrepresentation. Something in the tone of your letter makes me answer, and unwilling to leave it unanswered, I write to say that the statement you sent me is false. In some opening remarks of a course on geology, which I am now delivering in the University, I said that the 'theological interpretation of the Book of Genesis, giving six thousand years as the age of the world, was a hindrance to the understanding of geological evidence, and no one who started with this idea, and allowed his researches to be influenced by it, could be a geologist.' I do not remember my exact words, the lecture being extemporaneous; but this is the substance, and I know that I did not say what your newspaper extract reports."

**THE LEVEL OF THE MEDITERRANEAN AND RED SEAS.**—During the celebrated Egyptian campaign of 1798, the difference of level between these two seas was calculated by the French engineers, and found to be 0.85 of a meter. The result obtained in making the survey for the construction of the Suez canal, in 1866, was .86 of a meter. The accuracy of the earlier survey is very strikingly confirmed by the close coincidence of these results.

**A VALUABLE PRESENT.**—What more useful present can be made to young mechanics than a year's subscription to the *SCIENTIFIC AMERICAN*? Employers will be doing their employees a great service by acting on this hint, and we feel sure that at the end of the year they will consider the investment a good one.