## IMPROVED SEWING MACHINE MOTOR.

Domestic motors, unless they present the three elements of safety, simplicity, and cheapness, stand little chance of gaining popular favor. We are inclined to believe the same is true of apparatus which, apparently filling the above conditions, is nevertheless of a nature intrinsically against which prejudice exists. Thus, we doubt if any woman would charge herself with the care of a boiler and steam engine, however small its dimensions, or would undertake to manage the battery of an electro-magnetic machine; the one she has connected in her mind with explosions and similar casualties, while of the other the average female is, as a rule, totally ignorant, and hence timorous. Every woman, however, has some idea of clockwork—knows that it runs when wound up, and is not liable to sudden freaks in the way of bursting and giving disagreeable shocks; and consequently, if she finds she can drive her machine for some time by turning an exaggerated clock key a few revolutions, the chances are that she will do so rather than tire herself over the treadle, simply because, in the case of clockwork she is familiar with the power she deals with, while in the case of steam or electricity she is not.

The inventor of the device illustrated in the annexed engravings has produced an arrangement of spring mechanism for actuating sewing machines, which, judging from a recent inspection of its operation, is capable of giving excellent results. Every one, it is presumed, is reasonably familiar with the general principles of such apparatus, and hence an allusion to them is not needed, nor is it deemed necessary here to enter minutely into the intermeshing of the various transmitting wheels. Suffice it to state that the connection between the parts is simple, and readily understood from a glance at the device itself. The points to which attention is especially directed are the mode of insuring an equal and uniform power during the entire period that the spring is unwinding, and the brake mechanism by which the motion is controlled.

To insure the best application of power throughout, the inventor has recourse to an arrangement very similar to the ordinary fuzee. On the spring shaft, A, Fig. 3, is a cylinder to the periphery of which a chain is attached. The latter is also secured to the larger portion of the spirally grooved drum, B, so that the motion thereby transmitted to said drum rotates the large cog wheel, C, and thence passes to the other mechanism, and finally, to the belt pulley of the machine. The winding is done by a winch applied to the shaft, D, Fig. 1, with the pinion on which and also with the main wheel, C, an idle wheel, E, may be slipped into and out of gear (by a longitudical motion of its shaft in its bearings) at will. By this means not only is the powerful coiled spring, represented at the right of Fig 1, wound, but the chain tightly wrapped in the grooves of the drum, B, Fig. 3. It will be noticed that, during the first turns of the winding, which require but little power, the chain winds about the larger portion of the drum, B, between which and the diameter of the driving wheel, C, there is less difference of leverage; but toward the end, when much more power is needed to finish the work, a greater leverage is afforded through the decrease in diameter of the portion of the drum on which the chain then winds. When the spring begins to unwind, and so to drive the mechanism, the exact converse of the above takes place. The power, at first strong, is applied to the smaller portion of the driving drum, and then, as it diminishes, its point of application gradually changes so as to work with proportionally increased lever age. The drum being properly shaped, the result is to cause strong power to act upon short levers, and light power on long levers, effecting a uniform transmission of force. The same end may be reached by replacing the cylinder with another conical drum.

The brake mechanism is represented in Fig. 2. F is a flat elastic bar, to which is attached a cushion, G, which acts as a brake shoe against the fly wheel, H. To the outer end of the bar, F, is secured a rod which passes up through the table, and ends above in a button, I. By raising the latter, the cushion is removed from the fly wheel and the works allowed to operate; by lowering the button, the brake is again applied, and stoppage results. A brake at J presses upon the belt wheel shaft, and is held down upon the latter by the pressure of the foot upon the bar, K, under the table. By increasing the pressure, and consequently the friction of brake. J, the machine is caused to travel more slowly; and by relaxing the same altogether, full speed is permitted.

Sufficient being now said to convey an idea of the construction of the device, we may state that its general appearance is excellently shown in Fig. 1. It may be applied to any machine, requiring no other modification of the latter than the replacing of the table, if of ordinary size, by a larger one. Eight turns of the crank—which, owing to the interposition of the idle wheel, are made in direction from the operator—suffice to wind the spring and set the machine in operation at full speed, estimated at about 720 stitches per minute for twenty minutes. This, though very much faster than is ever necessitated in actual practice, was accomplished several times in our presence, the needle in one instance piercing many thicknesses of muslin or linen. Probably once in every half hour would be all the winding required for continuous work, and this, as we have above explained, is an operation of little difficulty, done in a very few seconds, and controlled by the ratchet wheel and pawl shown in Fig. 2.

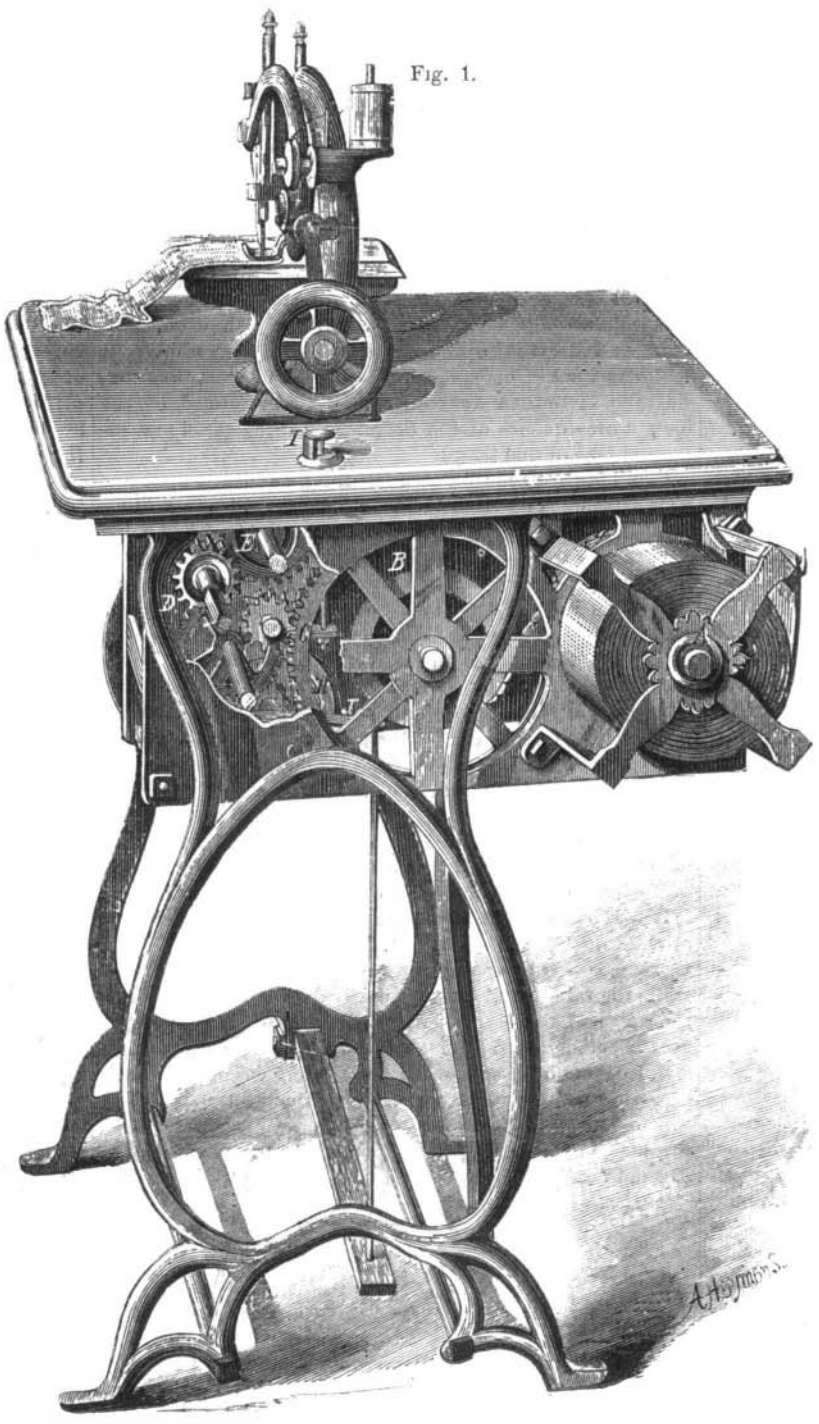

Fig. 1.

## YOUNG'S SEWING MACHINE MOTOR.

The invention appears to us to be a successful application of simple and, certainly, not expensive mechanism, to a much needed end. Women's work upon the treadle is none of the lightest, and, while always temporarily fatiguing, sometimes results in permanent physical suffering. This, added to the fact that the sewing machine is one of the most important, if not the first, of modern household gods, should bespeak careful examination for the device.

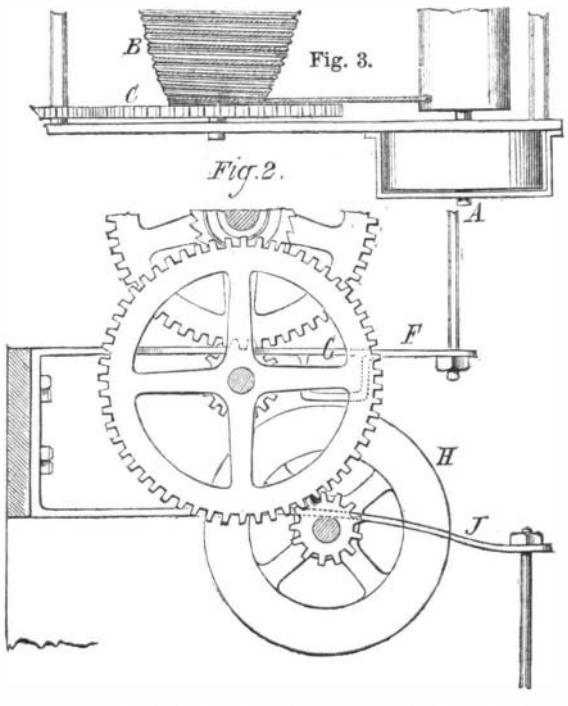

Fig. 3.

Fig. 2.

Patented by Mr. William Young, July 8, 1873. For further particulars address C. T. Crawford, 42 Franklin street, Baltimore, Md

### Music by Telegraph.

Mr. Elisha Gray, of Chicago, a gentleman well known as an inventor and manufacturer of telegraphic apparatus, has perfected an instrument by which, says the *Journal of the Telegraph*, sounds produced at one end of a wire can be conveyed to the other end by electricity, over circuits of great length. It has, says the *Journal*, already been tested upon the wires of the Western Union Telegraph Company over a circuit of 2,400 miles, with the most satisfactory results. Tunes, played upon the keyboard of the transmitting portion of the apparatus, were distinctly audible and unmistakably reproduced, note for note, at the distant end of this long circuit.

The apparatus has been named by Mr. Gray the telephone. The transmitting apparatus consists of a keyboard having a number of electro-magnets corresponding with the number of keys on the board, to which are attached vibrating tongues or reeds, tuned to a musical scale. Any one of these tongues can be separately set in motion by depressing the key corresponding to it. To this transmitting instrument the conducting wire is attached, the other end being attached to the receiving apparatus, which may be anything that is sonorous so long as it is in some degree a conductor of electricity. A violin, with a thin strip of metal stretched between the strings at a point where the bridge of the instrument is ordinarily placed, will, on receiving the sound transmitted through the conducting wire from the piano, give out a tune very similar in quality to that of an ordinary violin.

### Preservation of Iron Ships.

A few weeks ago (22d of May) we summarized the instructions issued by the Admiralty relative to the preservation of boilers by the placing of unslaked lime in those boilers which could be kept empty, and, in those cases where they were liable to leakage from the sea, by filling them with a solution of lime in sea water. The result of the experimental application of the solution of lime has been so satisfactory that its use is to be extended to iron and composite ships, under the circumstances described in the following circular, No. 36 of 1874, lately issued by the Admiralty: "Experiments having shown that the destructive action of bilge water on the iron frames, etc., of iron and of composite vessels may be reduced or altogether obviated by the use of lime, my Lords Commissioners of the Admiralty are pleased to direct that in all cases where it may be found impossible to dry out completely any of the compartments, bilges, or wings, in order to coat them with composition paint, or cement, as prescribed by circulars 28 of 1872, 22 of 1873, and 31 of 1874, lime well slaked is to be placed in the water contained in such places. As unslaked lime would injure coatings of composition, paint, or cement, care is to be taken that the lime used is thoroughly slaked."—*Engineering.*

### The Sczaroch.

The Russians have lately adopted a new shell which, according to recent experiments, seems to be a formidable projectile. It is well known that with the ordinary elongated bolt a ricochet fire cannot be maintained; and as this species of firing is very effective against masses of troops, the loss is a matter of considerable moment. The sczaroch, for such is the name of the new projectile, is either a percussion or time shell and a shot, the latter of which ricochets beyond the point of explosion of the bursting charge. The shell portion is a simple iron cylinder, to one end of which is secured, by a thin sheet of lead, a spherical shot.

On leaving the gun the combined projectile acts like an ordinary elongated shell; but as soon as the explosion of the charge takes place, the cylinder of course flies in pieces, while the shot, impelled by the additional velocity and by reason of its form, ricochets for hundreds of feet ahead. In firing at batteries, the double effect of this projectile comes into excellent use, as the shell might be exploded among the guns, while the ball would strike far in the rear among the reserve troops; or while the shell might burst in the front rank of an advancing column, the ball would continue plowing its way through several succeeding ranks.

### Another Dam Disaster.

The bursting of the Mill River reservoir has been very closely followed by the breaking of another dam in Massachusetts, thirty miles northwest of Springfield and on the line of the Boston and Albany Railroad. Twelve bridges, four manufactories, and several dwellings, valued at about half a million dollars, were destroyed, beside the vegetation in the path of the flood being generally devastated. Happily no lives were lost, warning being given in time.

From all accounts, the casualty was due to the imperfect construction of the reservoirs, which appear to have been mere mud banks built some forty years ago. The recent heavy rains probably proved too much for the sustaining power of the soil, and hence the barriers gave way.