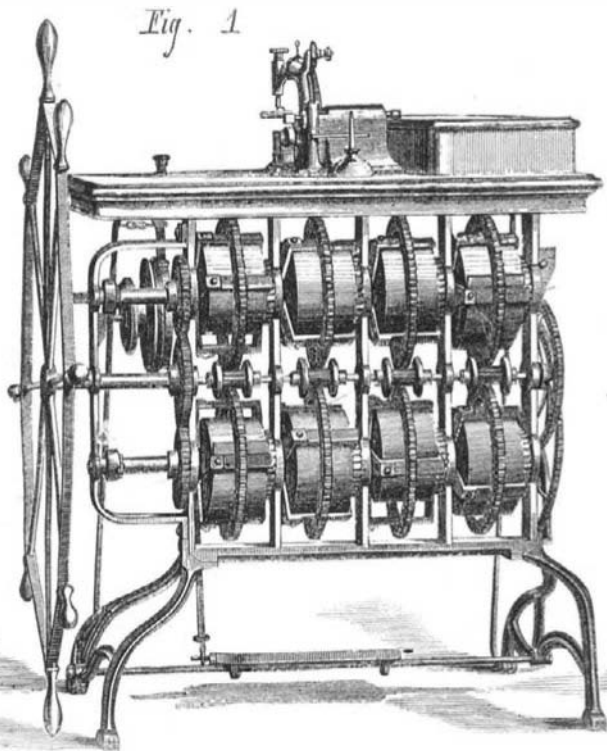


SPRING POWER FOR SEWING MACHINES.

On page 247 of the previous volume, we laid before our readers the results of the investigations made by the Massachusetts State Board of Health into the injurious effects upon the health of women employed in running sewing machines by foot power. The facts were established that among such operatives certain diseases exist in a greater proportion than with other females, and that they result from excessive work in propelling the machine by the feet. It was shown, further, that what proved excessive labor in one form might be far from excessive in another, and that the number of hours these operatives work daily would not injure them if the machines were run by steam or other power.



The invention we now illustrate appears to meet the requirements of the case by furnishing a simple and economic motor which can conveniently be applied to any form of the sewing machine. It consists of a spring power, mounted in a neat frame, to the top of which the table of the machine is attached.

Fig. 1 shows the apparatus, uncovered so that the driving mechanism may be seen; and Fig. 2 shows the same applied to a machine of a different manufacture, and case. The motive power consists of eight coiled springs which are mounted on sleeves on parallel shafts, four on each shaft, as shown in Fig. 1. Each of these shafts is grooved longitudinally so as to carry a sliding key which is worked by a sliding collar on the outer end of the shaft. By means of this key, the sleeve of either of the springs can be locked with its shaft so as to allow of its being wound up by the rotation of the same. Both shafts are connected by gearing with a central one, and the winding up is done by means of a detachable hand wheel or windlass placed on the latter, as in Fig. 1, or by means of a crank handle such as is seen at foot of Fig. 2. In winding up, one spring on each shaft, upper and lower, may be locked and wound simultaneously. The power developed by the recoil of the springs is communicated through gears to a central shaft, as in Fig. 1, from which it is transmitted by appropriate gearing and a pulley and belt to the driving shaft of the sewing machine. A brake, represented in both figures, is attached to the apparatus, and by its means the machine is started or stopped, and its speed regulated. The treadle shown in the engravings is employed solely to operate this brake while at work; and by its use the speed may be slackened or allowed to start up again, etc., with great nicety and ease. The brake is also further adjustable by means of a spring lever and thumb screw, which are connected therewith and are placed for operation on the top of the machine table, as represented. A still further adjustment of the apparatus is provided for in the shape of an attachment by means of which two or four of the springs, as desired, may be locked off and prevented operating on the central shaft. We may remark, also, that the winding up can, by the construction, be done while the machine is running, if required.

Two sizes of the spring power are at present manufactured, the larger of which is calculated to run for one hour and the smaller for half an hour, the speed in each case being one third faster than that obtained in working a sewing machine by foot power. We are informed that a man can wind up the whole eight springs of the larger size in one minute, using the crank handle; and that a lady, using the hand wheel of large diameter, would accomplish the same in less than five minutes. Thus, in a day of ten hours, less than an hour would be occupied in winding up springs, and over nine hours would remain for mere sewing, unaccompanied by hurtful exertion; while the work accomplished would be more than could be done in the ordinary manner on account of the extra speed. It is stated that a boy of fourteen can do all the winding up necessary to keep twenty machines going.

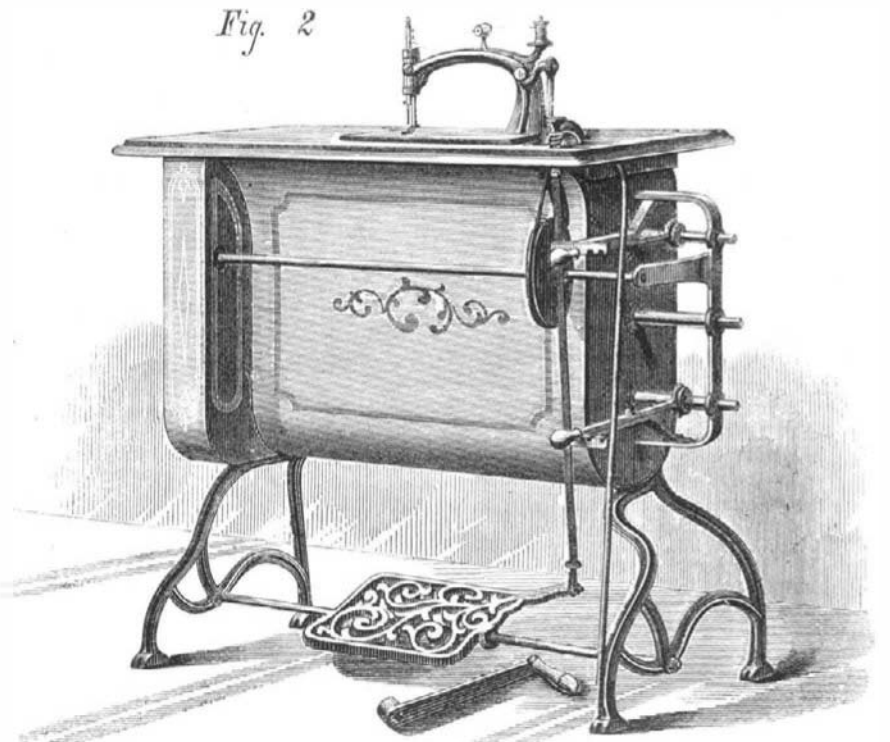
Mr. John M. Cayce, of Franklin, Tenn., is the inventor of

his power, which is patented in this country and in Europe through the Scientific American Patent Agency. Further information may be obtained of the United States Combination Spring Power Company, 97 Spring street, New York.

Chinese Wheelbarrows.

Crossing some uncultivated chalky downs in the province of Honan, where the roads were good, Mr. Oxenham came upon large numbers of wheelbarrows; and in one place where the country was unusually high and open, and where a strong wind was blowing in their favor, all of them set up a sail to assist them in their journey. The men who use these cumbersome and loud shrieking vehicles contrive to make about 20 miles a day, and in the event of a favorable wind, often 30. One man generally manages the wheelbarrow, though he

within. When the lamp is in an upright position, the extinguisher is supported by the ring, on which its arms rest, and is placed sufficiently far down on the wick tube for the latter to be on a level with or project slightly above it. Under these conditions, which are represented in the sectional view, Fig. 2, the light is free to burn, but upon the weight being swung, or the lamp being caused to deviate from its vertical position, one or other of the sides of the ring is thrown upward and carries with it one of the arms of the extinguisher; by which means the latter is thrust beyond the wick tube and over the wick, and the light is extinguished. The latter conditions are shown in Fig. 1, and indicated by the dotted lines in Fig. 2. By bending upward the sides of the ring, the parts may be adjusted so that a very slight tilting of the lamp suffices to put the light out.



CAYCE'S SPRING POWER FOR SEWING MACHINES.

sometimes avails himself of the services of his son, his wife, or his donkey. No laborer in the United States or Europe probably undergoes an equal physical strain to the Chinese barrowman, who seldom reaches the age of 40 years.

GOODRIDGE'S AUTOMATIC LAMP EXTINGUISHER.

The accompanying engraving represents a neat and ingenious device for attachment to kerosene lamp burners, by the automatic operation of which the extinguishment of the light is immediately effected in the event of the accidental falling or tilting of the lamp.

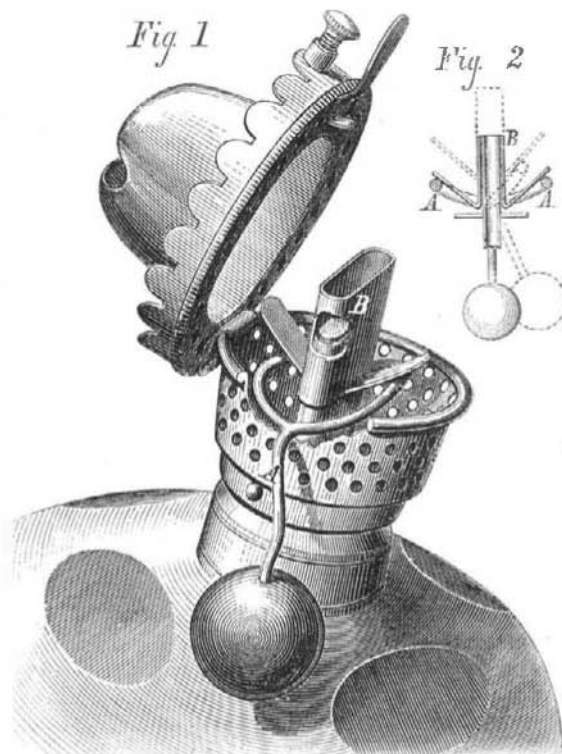


Fig. 1 gives a perspective view of a burner with the extinguisher attached. Part of the outward shell of the burner is broken out to show the ring and bent wire, A. The ring which, it will be observed, entirely surrounds the wick tube is pivoted to the shell, on the further side, by a pin which enters one of its perforations; on the nearer side, the bent wire, which passes through another perforation, also acts on a pivot. On the lower end of the wire hangs a leaden weight, the tendency of which is always to keep the wire in a vertical, and the ring, consequently, in a horizontal, position. At B is shown the extinguisher proper, which consists of a short piece of tube which is placed on the end of the wick tube and slides easily thereon. It is provided with the two projecting arms seen in the engraving, where it is represented with a hole in one side to show the tube and wick

In the provision thus made for extinguishing the lights before the oil in the lamp has time to escape and become ignited, appears to lie a safeguard against many of the disastrous results hitherto attending lamp accidents.

Patented March 12, 1872, by John M. Goodridge, of Norfolk, Va., of whom further information can be obtained.

Instrument for Measuring the Transparency of the Sea.

A correspondent of the New York *Herald*, accompanying Professor Agassiz' expedition on the coast survey steamer *Hassler*, gives a brief but interesting account of an apparatus for determining the relative transparency of the sea at different places, which has already been employed by the expedition at Barbadoes and about the Galapagos Islands. A strip of board, about four inches wide and four feet long, divided into a scale of ten equal intervals, is painted a dark lead color at one end, fading into white at the other. A large white board having been fastened parallel to it, and at a measured distance below it, the whole arrangement is lowered horizontally into the sea. At the dark end, the upper board appears the darker, but at the white end, the lower board, being seen through a greater depth of water, gives the darker appearance, and, of course, at some intermediate division, the two boards appear to be of the same shade. At that division the relative whiteness of the boards is evidently a measure of the percentage of light absorbed while going down and up again through the distance by which the boards are separated. This relative whiteness is readily estimated at night in the cabin by placing the boards at unequal distances from a candle so as to make them of the same apparent shade at the given division of the scale.

The illuminating powers are to each other as the squares of the distances of the boards from the light. Having once ascertained what percentage of light goes through a fathom, the proportion of daylight which reaches any given depth in the sea can be readily calculated. Suppose, for example, that one half the light penetrates one fathom; then one quarter goes down two fathoms, one eighth, three fathoms, and so on indefinitely.

This apparatus is the invention of Dr. Hill, who regards it as still in a crude form, and capable of much improvement.

PROFESSOR PALMIERI records a singular observation on the recent remarkable eruption of Mount Vesuvius. The vaporous emanations alone were observed to be charged with positive electricity, while the ashes alone were charged with negative electricity. Hence electric effects resulted from the collision of the clouds of ashes with those of vapor, thunder and lightning being produced as in an ordinary storm.

THE brewers in this country are considerably exercised by an attempt, on the part of the holders of William Marr's patent of 1867, to collect damages for the use of bisulphite of lime, which is employed to arrest the fermentation during the brewing operation. The grant of this patent appears to have been a blunder on the part of the Patent Office, as bisulphite of lime has been so employed for many years.