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THE LITTLE MONITOR SEWING MACHINE.

We have examined with much interest sundry novel improvements, which have recently been added to the sewing machine the distinctive title of which forms the above caption. These improvements are claimed by the inventor, in connection with the other advantages already possessed, to impart capabilities to the implement of considerable value in their variety and utility, and at the same time to insure for it that popular appreciation which is always accorded to simplicity of parts and facility of operation. We took occasion, some years ago, to describe in detail this machine as then constructed; and as certain important portions are unaltered, a repetition of the description is deemed unnecessary. For the proper comprehension of the improvements, however, the principal features may be briefly considered as we progress.

The machine is one in which two threads are used to form principally a lock stitch. This is effected wholly without shuttle mechanism; and the thread, in lieu of being wound upon bobbins, is used directly from the ordinary spools. One spool is located above, as shown in Fig. 1, the other is somewhat curiously placed directly below, the needle, and is previously inclosed in a hard rubber case, shown in Fig. 2, which is exactly the shape of a conical rifle shot. The end of the thread is carried through an opening in this case, and is then wound once or twice about the wire guard. The case is then inserted between two curved metal pieces, A, Fig. 3, and is retained in place by the pivoted stop, B. The end of the thread is carried back between the parts of the case holder and there left. It requires no further care, for the turn or two made around the wire guard of the case gives it the requisite tension. The general construction of the parts last described is new, and is an improvement on that of the similar portions in the older machine.

As regards the manner of forming the stitch, instead of the usual shuttle mechanism there is a rotating hook, represented at C, Fig. 3. Its shank is shown at D, Fig. 1. It is pivoted to a disk which imparts to it its rotary throw. The upper thread, after being carried through the fabric by the needle, is retracted so as to produce a slack loop. Into this the advancing hook catches, pulling it (the loop of course opening out) over the point and the smooth surface of the spool case, until it finally slips off said surface and likewise off the hook. The loop then lies loosely on top of the spool case and incloses the lower thread. The hook, continuing its rotation, takes a second loop from the needle, and carries it along as it did the first. As it opens out the second loop, it pulls taut the slack of the first one, and thus the stitch is completed. The capabilities of the machine in this respect, however, are not confined to the lock stitch alone, although that form, owing to its strength and security, is usually the most popular. A very neat embroidering stitch with two threads can be produced, or the lower spool may be abolished altogether and the instrument transformed into a single thread chain stitch machine, and this without any adjustment whatever beyond pushing in the little catch, shown at E in Fig. 3. It will easily be understood that, without the lower thread to lock the stitch, the rotating hook would keep on making loop after loop of the upper thread, which would slip off over the spool case and never be caught Now, with the catch, E, pushed in (the lower thread still absent), the loop catches at once on that obstacle, giving the needle time to come down and pass through loop No. 1, and for the hook to engage loop No. 2, so that the second loop is pulled through the first one and so on, forming the chain. With the lower thread in action, precisely the same operation continues, only the lower thread becomes caught over a portion of the chain made by the upper thread, and literally forms a spiral about it, so that on one side of the cloth is a row of simple, straight stitches, and on the other a chain stitch and a spiral thread mingled, the latter not passing through the fabric

Fig. 1

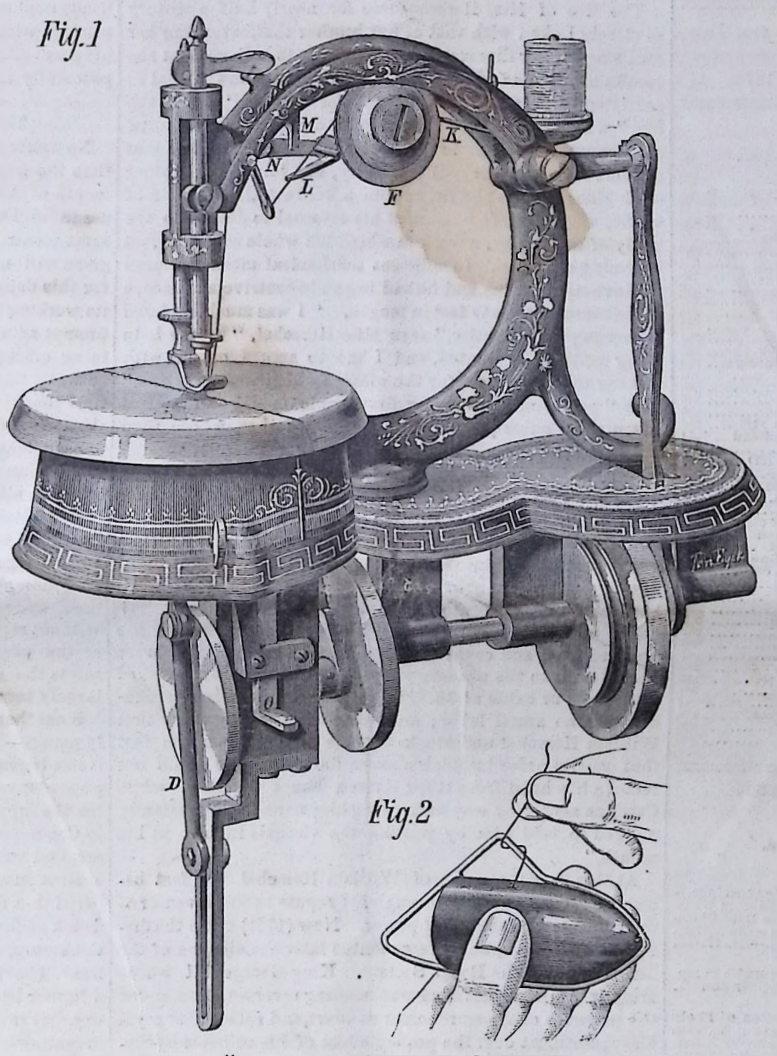
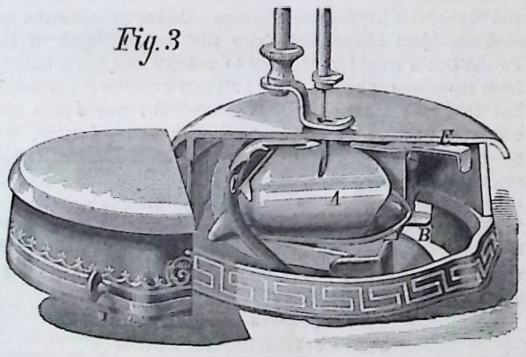


Fig. 2

DU LANEY'S "LITTLE MONITOR" SEWING MACHINE.

Fig. 3



The most ingenious portion of the machine, and at the same time the newest, is the device for giving tension to the upper thread, and this is entirely different from any other piece of mechanism, devoted to like purpose, which has come under our notice. Its disposition and its construction will be seen in Figs. 1, 4, and 5. It consists of a metal disk, F, having a sharply grooved periphery, G, and secured by a screw to a lug on the stationary arm of the machine, as represented in section, Fig. 5. This screw serves as an axis, about which the disk revolves. The screw head is countersunk, and beneath it are several flexible washers. The threaded portion enters the lug, as stated, and therefore it is obvious that, by turning said screw inward, the disk may be crowded against the lug, and its rotation, through the friction engendered, rendered less free. This, however, is adjusted by the manufacturers, and the limit of the inward motion of the screw is defined by the small set screw, H, Fig. 5, inserted in the lug from the opposite side.

The principle on which the attachment is constructed is that (the thread from the spool being wound once around it), when every stitch begins, it shall turn so as to release exactly enough thread to make that stitch. This is carried out as follows: In a channel in the disk, and between it and the lug, is placed a clutch, I, Fig. 4, which embraces the axial screw and has a wedge-shaped extremity, J, which bears against the inner periphery of said channel, being thus held by the spring, K. The other end, L, is elongated and is so placed as to be struck and carried down by the projection, M, on the moving arm of the machine. The consequence is that, at each descent of the needle, the arm, L, being forced down, its opposite end, J, is wedged against the disk, and turns the same forward a distance proportionate to the travel of the arm, L. It is obvious that, by governing this travel, we govern likewise the rotation of the disk, and hence the amount of thread unwound in the direction of the needle. This is easily done by the simple pivoted bar, N, which has an arm at right angles at its extremity, as shown in Fig. 1, which extends directly over the clutch arm, L. By raising or lowering said extremity of N, the clutch arm is pushed more or less down, and consequently the projection, M, strikes it earlier or later, and accordingly pushes it a greater or less distance.

The tension regulator must, of course, be used in connection with the stitch governing devices. To alter the length of the stitches, it is simply necessary to raise the catch, O, Fig. 1, which governs a stop limiting the motion of the feed bar, which is actuated by eccentric devices on the rear of the disk on the left. When a short stitch is used, the tension regulator is set to allow but little thread to escape from the tension disk, and *vice versâ*.

In Fig. 4 it will be seen that the bar, P, to which the bar, N, is pivoted, is curved and extends downward, terminating just below the coiled presser spring. This is a very neat device for yielding, automatically, the extra thread required in sewing thick cloth. In that case, the upward motion of the feed teeth acts on the fabric and lifts both it and the foot; as the latter rises, the bar, P, ascends with it; and consequently the bar, N, also lifts, and is followed by the clutch arm. The ensuing descent of the last causes, as before explained, a partial revolution of the tension disk, and thus a small amount of thread is given off, in addition to that caused to unwind through the movement of the main arm. This arrangement is sufficient to give the extra thread without requiring any adjustment of the tension or change of stitch, and of course adapts itself to varying thicknesses.

Lack of space compels us to summarize briefly the other advantages. These are: An ingenious arrangement whereby the chafing of the thread against the needle is prevented; ball and socket joints which render the pitman and treadle adjustable; a self-setting needle which cannot be inserted wrongly; and the noiseless operation of the mechanism.

We are informed that the demand for the machine is now very large, and has made it necessary for the manufacturers considerably to increase their facilities for construction. This has been done in the purchase of the Union Iron Works, at Rhinebeck, N. Y., with all the machinery therein, so that at the present time 300 machines can be made weekly. A large machine for manufacturing uses, on the same principle as the one that we have described, is now being manufactured. The various devices have been patented in this country and abroad by Mr. G. L. Du Laney. For further information address the manufacturers, Messrs. G. L. Du Laney & Co., 744 Broadway, New York city.

Fig. 4

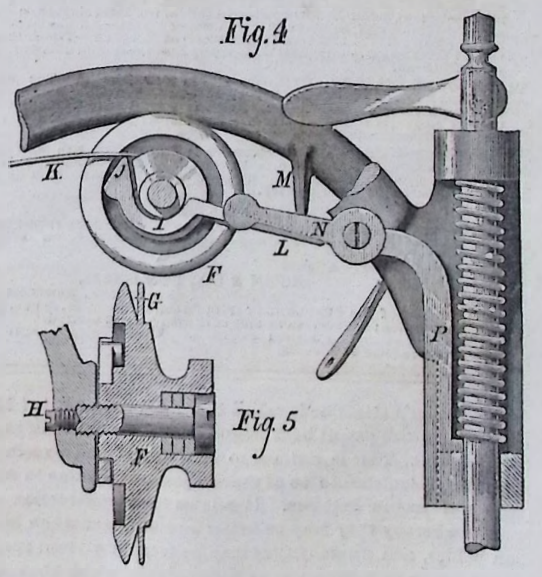


Fig. 5

Scientific American on the Industrial Uses of Asbestos and H. W. Johns (1876)

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THE INDUSTRIAL USES OF ASBESTOS.

Asbestos is a mineral fiber, composed of silicate of magnesia, silicate of lime and protoxide of iron, and manganese. Mineralogically the name is given to the fibrous varieties of tremolite, actinolite, and other varieties of hornblende, excepting such as contain alumina, and also to the corresponding mineral pyroxene. It exists in vast quantities in the United States, in various parts of Great Britain, Hungary, Italy, Corsica, and the Tyrol. To various kinds of asbestos have been applied the names "mountain leather," "mountain cork," "amianthus," and "chrysotile;" and certain other minerals having characteristics resembling those of asbestos are described as asbestoid, asbestiform, and as lamellar-fibrous. Without entering into any description of these species (for we have to deal only with asbestos proper, in considering its industrial applications), we may at once note the chief characteristics upon which the value of the mineral depends. And these are, first, its indestructibility by fire and its insolubility (except for a few varieties) in acids; secondly, its peculiar fibrous quality.

The material is obtained from the mines in forms ranging from bundles of soft silky fibers to hard blocks. The blocks may be broken up and separated into fibers, which, like those naturally obtained in that state, are extremely flexible, admit of great extension in the direction of their length without cracking, are greasy to the touch, and very strong. The fiber obtained in New York and Vermont varies in length from two to forty inches, and resembles unbleached flax when found near the surface; but when taken at a greater depth, it is pure white. Upon the length, flexibility, and strength of the fiber, the value of the asbestos depends. The engraving, Fig. 1, is drawn from an exceptionally fine piece, and exhibits the fibrous structure very perfectly. The fragment is 43¾ inches long, 7½ inches thick, and 21 inches wide, and weighs 114 lbs.

It is a curious circumstance that, although the valuable qualities of asbestos have been known since time immemorial, it is only during very recent years that the mineral has been extensively used. Its employment among the ancients was confined to the manufacture of an incombustible cloth in which the bodies of the dead were cremated, and of napkins which were cleansed by throwing them in the fire. We find record of its employment as lampwick and for fireproof

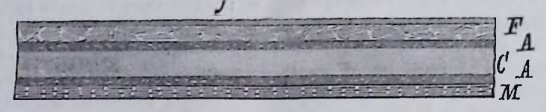
Fig. 1.



A FINE PIECE OF ASBESTOS.

containing asbestos, but through its composition independent of that material. From Fig. 2, which is a section of the asbestos roofing, its construction will be understood. F is a layer of asbestos-coated felt; A A are layers of acid and waterproof composition into which asbestos enters. C is a canvas, and M a manilla lining. These materials are compressed to a sheet resembling leather, about one tenth inch in thickness, and produced in continuous rolls about 40 inches wide, each roll containing 200 square feet. The weight is 50 lbs. per 100 square feet, or about one tenth that of gravel roofing. The manner of applying the rolls to the roof is shown in Fig. 3, the operation consisting in merely tacking the fabric to the boards. This is done with equal facility on either flat or steep roofs. The last process is to go over the laid roofing with a prepared coating of suitable color. This is made of asbestos in a flocculent state, mingled with silica paint body and other ingredients. It is applied with a brush,

Fig 2.



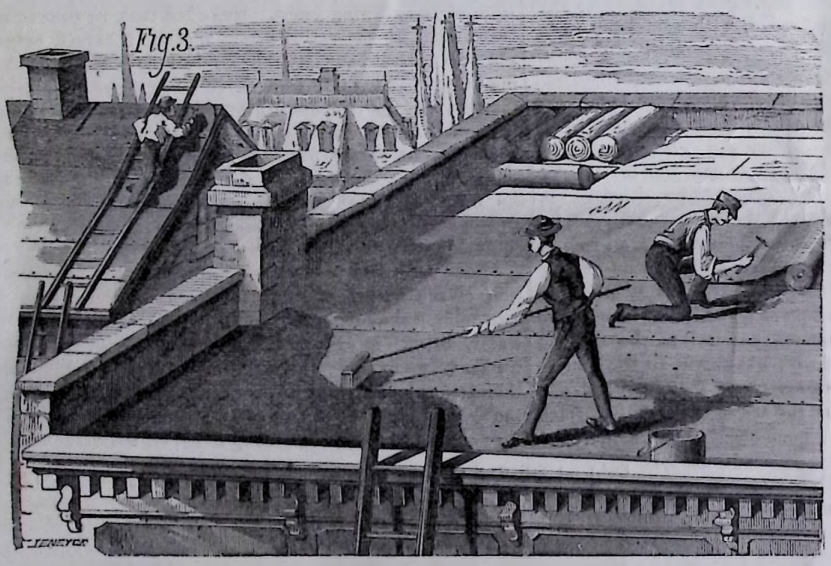
ASBESTOS ROOFING—SECTION.

plying the insulating material will readily be understood from Fig. 4, which shows both a boiler and a portion of a steam pipe, covered, F being the felting. We are informed that the materials are very easily and cheaply applied, that the pipes so covered are smaller and neater than is usually the case, and that there is no danger of the envelope cracking through the expansion of the pipes. These feltings were subjected to severe tests, at the New York navy yard in 1874, which they successfully withstood, showing the highest degree of efficiency as non-conductors of heat.

Asbestos steam packing offers in itself utilizations as important in some respects as any other here mentioned. Ordinary packing in engines is obliged to contend with an elevated temperature, moisture, and friction, all agents tending towards its destruction. From the testimony of those who have used asbestos prepared as below described, it appears wholly indifferent at all times to temperature and moisture, while its self-lubricating qualities protect it greatly against wear due to friction. The mode in which the packing is made is shown in Fig. 5. The long flexible fibers of the asbestos are securely covered by a thin braid, forming ropes from three eighths to two inches in diameter, which are put up in coils of 50 lbs. each. It is especially suited for use in cases where the effect of high pressure steam is to be met. We are informed that it has been employed without removal on an ocean steamer which sailed over 90,000 miles, and in another case on a locomotive which ran over 50,000 miles, in both instances showing but slight effects of wear, and necessitating no stoppages.

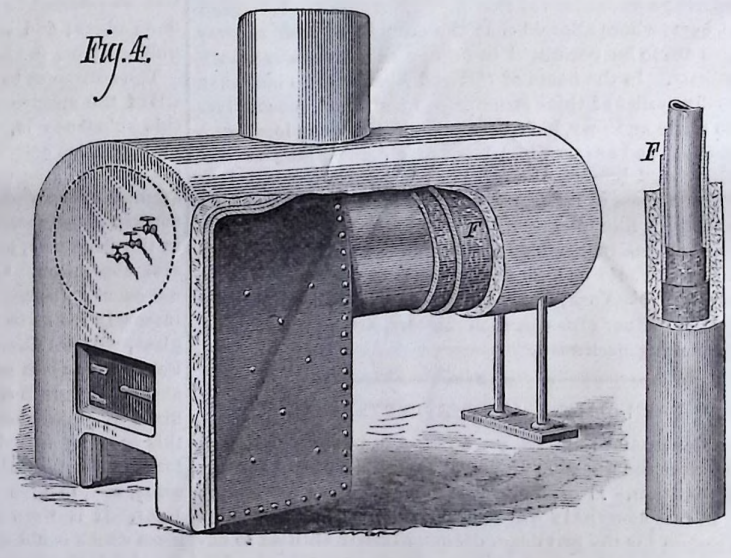
As a paint body, some varieties of asbestos, through its capability of being reduced into almost impalpable powder, has been found excellently adapted. It is exceedingly tenacious, and so renders the pigments not liable to chalk, crack, or scale, while it possesses superior covering qualities. Less coloring matter is required in the manufacture of these paints than in any other, and they are prepared and sold by Mr. Johns ready for immediate application by the brush. The ingredients are simply the best linseed oil and colors, with the asbestos body; and the paints are not offered as strictly fireproof, although it is believed that they will resist fire after drying, much better than ordinary paint. They are made in all shades, and are especially well suited for outside work, such as railroad cars and bridges, walls, fences, etc.

Fig. 3.



LAYING DOWN ASBESTOS ROOFING.

Fig. 4.



ASBESTOS-COVERED BOILER AND PIPE.

gloves and clothes for metal workers and firemen. Not very long ago, we learnt of its entering into a peculiar quality of wall paper made in Rome, Italy. With these few exceptions—and in no case has any of them risen to the level of even a minor industry—asbestos has occupied the position of a mineralogical curiosity, a product reasonably certain some day to find its place in human economy, but nevertheless one which inventors seemed systematically to overlook.

It is to Mr. H. W. Johns, of New York city, that the credit of first using asbestos for industrial purposes on a large scale is due. Some years ago, that gentleman invented a cement in which one of the ingredients was asbestos. Asbestos, however, despite its abundance, was then exceedingly difficult to obtain. It could be purchased only in small quantity at a high price, and certainly offered no very promising prospects of an adequate supply, should a large demand for the cement be realized. Nothing daunted by this scarcity, the inventor advertised his cement widely, through the SCIENTIFIC AMERICAN and other journals; and the result of his advertisements (as with considerable shrewdness he had anticipated) was not merely an augmented sale of his invention but an avalanche of letters from all quarters of the globe, in which the writers mentioned deposits of asbestos in their vicinity, and offered supplies. Thus, ere very long, Mr. Johns became possessed of abundant facilities for obtaining any quantity of the mineral, and was free to proceed with the experimenting which led to the other and more important utilizations which we are about to describe.

In a little volume which has been compiled from Patent Office records, we find over three hundred patents for roofing compositions, and probably this number is much below the total of this class of inventions. In all these compounds, there is a general sameness, due perhaps to the presence of gas tar and various conglomerations of gravel, resin, paper, felt, cement, and chemicals in the large majority. From all these, the asbestos roofing differs not merely through its and forms an elastic waterproof felting. For large and important city edifices, an asbestos concrete may be applied by means of a trowel and in lieu of the above coating. The advantages claimed for the roofing are that it forms a water and airtight smooth surface, which is a good non-conductor of heat, and is practically a resistant of fire: also that it is adapted to all climates, and is unexcelled in durability and cheapness by tin, slate, or shingles, of the qualities ordinarily used.

The second application of asbestos to which attention may be directed is as a covering for steam boilers and pipes. For this purpose it is prepared in various ways. A cement felting, composed of asbestos and a cementing compound, may

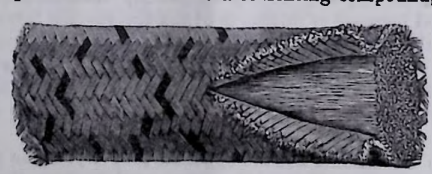


Fig. 5.—ASBESTOS PACKING.

be used like mortar and applied directly to the pipes, forming an excellent fireproof non-conductor of heat It is improved, however, as a covering by the addition of an asbestos lining felt, which is a strong sheathing, to one side of which is attached a layer of flocked asbestos. This is applied, say in two turns, directly around the pipe, and the cement laid on outside. Each layer of asbestos thus forms a sort of air chamber, which adds greatly to the insulating capabilities of the cover. At the same time the felt admits of the expansion of the pipe and also serves to protect hair felts, when the same are placed over it, from charring and other injurious effects of heat. An asbestos-lined hair felt is likewise manufactured, which is especially suitable for covering marine and locomotive boilers. The mode of application will readily be understood from Fig. 4, which shows both a boiler and a portion of a steam pipe, covered, F being the felting. We are informed that the materials are very easily and cheaply applied, that the pipes so covered are smaller and neater than is usually the case, and that there is no danger of the envelope cracking through the expansion of the pipes. These feltings were subjected to severe tests, at the New York navy yard in 1874, which they successfully withstood, showing the highest degree of efficiency as non-conductors of heat.

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Lack of space prevents our describing, in detail similar to the above, the many other productions into which asbestos enters. Of the more important of these we may mention asbestos cements (fire, acid, and water proof) for linings and fillings for iron columns, floors, and for slate and other roofs, for cementing steam and other joints, fire clay retorts, etc., A fireproof coating is also made for wooden structures and shingle roofs, and for surfaces, not exposed to the weather, which are liable to ignition. This is applied with a brush, and may be subsequently coated with asbestos paint. Asbestos board is made from pure asbestos in flexible sheets of various sizes and thicknesses, forming a valuable covering for locomotive boilers, and for flat packing, gaskets, etc., and as a protection for all surfaces exposed to fire. Asbestos paper is used for lining cloth, fire screens, etc., and for filtering acids. Asbestos thread may be woven into fabrics, and an asbestos lubricator is manufactured, designed for heavy machinery, wagon axles, etc.

All these varied applications are the result of continued experimenting and investigation on the part of the inventor, a labor which has lasted since 1867, and which is still in progress. That they are of a high degree of value and utility may perhaps best be judged by the rapid increase which has been felt in the demand for asbestos products, and by the excellent results which actual employment has demonstrated them capable of yielding. Any further information will be cheerfully given by the patentee and manufacturer, Mr. H. W. Johns, 87 Maiden lane, New York city

CLIPPING HORSES.—M. Veterinary Surgeon Félizet recommends that, instead of clipping working horses in autumn, a good shining coat, free from skin dust, can be secured by giving the horses, from the middle of September, either alone or mixed with their evening feed of oats, one tenth of a quart of bruised hemp seed, and the same quantity of buckwheat in its natural state.