THE SEWING MACHINE.—NO. I.

It is not more than seven years since this new industrial agent began to be introduced into general use, and yet if its history down to 1860 should be written, the magnitude and wide-spreading influence of its operations would give the narrative the style of romance. Many causes conspired together in preventing its early adoption by manufacturers, for whose work it was more especially adapted. Among these were—

1. The objection which meets every new invention on the start, "that it is an experiment which, if it fails, will cost us money."

2. Its introduction into a shop or factory would involve changes in the business, and new methods and new plans, and most people prefer to pursue the methods to which they are accustomed, and which are therefore easy.

3. After the "boss" or manufacturer is convinced that the invention will promote his business, he has yet to bring his operatives to the side of the new-comer, and get them interested enough to give it a fair trial. This is oftentimes difficult to do where the old prejudice exists that a labor-saving machine is an enemy to the poor.

4. The common sewing thread which had been good enough for seamstress and tailor at the rate of 50 to 60 stitches a minute, was found to be too imperfect and uneven for the rate of 250 stitches a minute—we might say, for the rate of 2,500 stitches a minute, since good sewing has been done at that speed.

It took years to overcome these objections, and before the last one could be surmounted, improvements and inventions had to be made in the art of manufacturing thread—especially silk thread, which was rarely of uniform size in the same skein, and so was unfit for machine sewing, whilst it was an essential article in many kinds of work. But the new demand called forth the requisite skill and invention, and now American "machine twist" rules the market and supplants the foreign article, both in the factory and the household. The production is about $1,000,000 a year, and the increased sales of spool-cotton since machine-sewing was introduced amount to more than $1,500,000.

Another branch of business which has been created is the manufacture of sewing machine needles, which is said to employ about 1,000 men, and the profits on which are put at the high rate of $6,000 per week. One dozen needles last about a week. All sewing machines are now japanned, and many of them are tastefully ornamented with inlaid pearl. In 1850 there were only two japanners in this city, but now we have several large establishments.

Along side of these facts we must place the business of the construction of the machines. The men employed are about 5,000 in number. The capital invested cannot be less than $3,000,000, and some of the companies divide 100 per cent. or thereabouts. The Wheeler & Wilson factory, at Bridgeport, Conn., rivals the U. S. Patent Office in dimensions, and it has a capacity for turning out 150 machines a day. When we assert that more than 200,000 sewing machines, of one kind with another, have been sold in this country, and 20,000 more exported, our readers will begin to be prepared for the statistics of some of its productions which we propose to collect hereafter. Many of these are known as single-thread machines, but the greater part sew with two threads. The single-thread machine makes the chain-stitch, and it is popular because of the low price at which it is afforded, and because the stitch is such as will unravel without having painfully to cut every other one, as in the two-thread machines. This is a desirable quality where in a family of children frequent alterations of clothing are required, such as letting out and taking in a tuck, etc. Clark's machine, manufactured at Bridgeport, Robertson's, Watson's and Gibbs', are of this character. The shuttle machine makes the interlocked stitch—one thread, at each completed movement of the needle, having been passed around the other. Singer, Ladd & Webster, Sloat, Wheeler & Wilson, Finkle & Lyon, and many other manufacturers produce machines of this class. The double-chain stitch is made with two threads, and the chief representative of this class is the Grover & Baker machine. This machine is preferred by the glove manufacturers, as the stitch is of an ornamental character, as well as exceedingly strong.

THE ORIGIN OF THE ROCK OILS.

MESSRS. EDITORS:—I propose to promulgate through the columns of your journal, a new theory regarding the origin of the oil known as petroleum or seneca oil, which is now attracting so much of the attention of the public.

I do not mean by "new theory," that the view I take of its originating from coal is new, but I shall attempt to detail the process by which it has been gathered in its present beds, and give facts and reasons, which to me, are ample for a reliable faith in the theory I now propose.

The close analogy in the character of the petrolium and coal oils, whether traced in the odor, the color, the benzole, naphtha, burning spirit, the unctuous lubricating grease, or the paraffine, give unmistakable evidence of all being derived from the same source. No such analogy can be found in any class of animal or insect oils or grease. My conclusion then is, and it corresponds in this respect with a majority of those who are most competent judges, that these oils are derived from coals, and with the coals originally from vast vegetable deposits. Long experience in the manufacture of oils from coal, and close observation of the various products eliminated in the destructive distillation of cannel coal, embolden me to say, that, cannel, bituminous and anthracite coals were originally deposits of masses of vegetable matter of nearly the same general constituent properties, and that the main difference which we now observe and which gives them distinctive names, has been caused by heat of greater or less intensity, which during former ages of the earth's history has been communicated to those deposits.

I shall have no difficulty in making myself understood by those accustomed to the process of obtaining oil from coal. To others the mysteries of which I speak, may remain mysteries.

When we apply heat to a retort filled with a good quality of cannel coal, we derive from the coal in the form of vapor, the various properties before named, and which by arranging our condensers so as to gather the products at points when the temperature subsides from 800° in the retorts, to 500°, 400°, 300°, 200°, 100°, and 30° respectively, we get at the first opening represented by 500° a thick paraffine oil, destitute of all spirit or property suitable for the burning oils so much sought for in the market, and marking a specific gravity of about 932 or 20° on the ether test. At the next opening representing 400° we get an oil mixed in a small part with spirit or burning oil, but in the main a heavy grease with a small portion of paraffine of the specific gravity of 900 or 25½° of the ether test. At the next opening 300° we get a product nearly all burning spirit, and of a specific gravity of 851, or 35° of the ether test, at 200°, or the next opening, the product will have a gravity of about 800, or 45 by the ether test, at a temperature of 100°, or the next opening, the product will represent a gravity of abont 735, or 60° on the ether scale, and at 30° of temperature the product will be very light naphtha of the specific gravity of 700, or 70° and even 80° and 90° on the ether scale.

This is about the range when sufficient heat is used to drive over the volatile matter in reasonable time for practical work, but if instead, a very low and slow heat be applied, very little but the light products will be driven over, and the paraffine, oil and grease will be left in the coke, which when burned will give considerable smoke and flame, while in the first case the smoke and flame will scarcely appear during combustion.

I suppose then, that the heat on our eastern slope, in the vicinity of our anthracite coal fields has been great, and that all the volatile matter has been driven off and for a time held in the form of vapor in the heated air above, while on the western slope, or the great bituminous coal basin, the heat has been less, but great enough to drive off the more volatile portion from these coals, which, like the first, was also for a time suspended in vapor above the earth, while the cannel beds which are the most elevated and most northerly of the coal beds, were not so much heated as to change materially their constituent properties.

The new theory then is, that the vapors thus raised would move by force of currents till some point was reached that was cool enough to promote condensation, and that which would first condense would be the heavy paraffine oil, which might fall in the form of pitch as at Trinidad, while the lighter might still be moved to other points till all except the most volatile would be converted and deposited, and it might be many years before those same districts were cool enough to permit the condensation of water, and allowing ample time for deposits of earth, and the chemical combinations that have covered and continue to protect those oil deposits from being displaced and driven off by the waters.

I am confirmed in these views and opinions by the great range in the specific gravities and of course in the qualities of the oils in different localities, varying ten to fifteen degrees in 25 miles, while in some distant localities the change is fully 25° by the hydrometer, showing in a manner conclusive to me that the deposits are from condensation, and not a distinct natural product as claimed by some, or the results of deposits from coral or other insect as claimed by others.

I am aware that I have opened a door for strong criticism, but if those who adopt other views will stick close to known facts for the basis of their theory, I shall be glad to meet such criticism. It is a field of great magnitude, while the vast quantities known to exist, puts a damper on the hopes and prospects of those of us who have spent so much energy, labor and money in preparations and the manufacture and introduction of coal oil. This happy discovery will give light to millions on millions of eyes, and it will give millions on millions of dollars to commerce.

Of its excellent character as a burning oil, and as a lubricator as compared with the best qualities of kerosene and other coal oils, of the number of wells, the average and aggregate quantity taken per day or month, of the probable durability of the fountain, as well as the qualities in different localities, I will write you for a different number, as a constant familiarity of several months, both in exploring the ground and analizing the oils will enable me to write a truthful history.

JOSEPH E. HOLMES.

Meadville, Pa., Sept. 15, 1860.

THE CRANK—A QUESTION ANSWERED.

MESSRS. EDITORS:—With your permission I will endeavor to answer the question of "a mechanic" in your number of August 11th, and I trust that a few words will make the matter somewhat plainer than the figure alone can.

The figure shows, and Professor Byrne proves the very point, which "a mechanic" not merely admits, but which forms the very ground of his question: viz. that the crank moves through a larger arc while the crosshead passes over the outer half, than while it passes over the inner half of the slides. "A mechanic" does not want the point proved, but wants to know the mechanical reason why?

There is, however an error implied in the form of this question, viz., "What does the irregular motion of the crank consist in?" The irregularity is not in the motion of the crank, but in that of the crosshead. That is to say, the movement of the crosshead over the outer half of the slide, is slower than its movement over the inner half, and, therefore, the crank (moving uniformly) passes over a longer arc in the first case than in the last.

The reason why this uniform motion of the crank produces an unequal motion of the crosshead is shown as follows:—Let the movement of the crank be resolved into two movements, one parallel to the slides, and the other perpendicular to them. That component of the motion which is parallel to the slides, will have the same effect on the movement of the crosshead, when the crank is at G moving outward, as when N is at F moving inward. But the other component, viz., that by which the crank leaves the line, G and F will act very differently on the crosshead in the two cases. In the first it draws the crosshead forward from A to C, and in the other, it retards the movement of the crosshead from B to C. So that in the first case both components of the crank movement act in the same direction on the crosshead, and its motion is that due to their sum; and in the latter case they act in different directions, and its motion is that due to their difference. Consequently, the crosshead when on that half of the slide next the cylinder moves with greater speed than when on the other half, the motion of the crank being uniform. Q. E. D.

Mount Vernon, Ohio, Sept. 15, 1860.