Sheet 1, 2 Sheets.

P. E. Ladrange.

Knitting Mach.

No. 3798.

Patented Oct. 16, 1844.

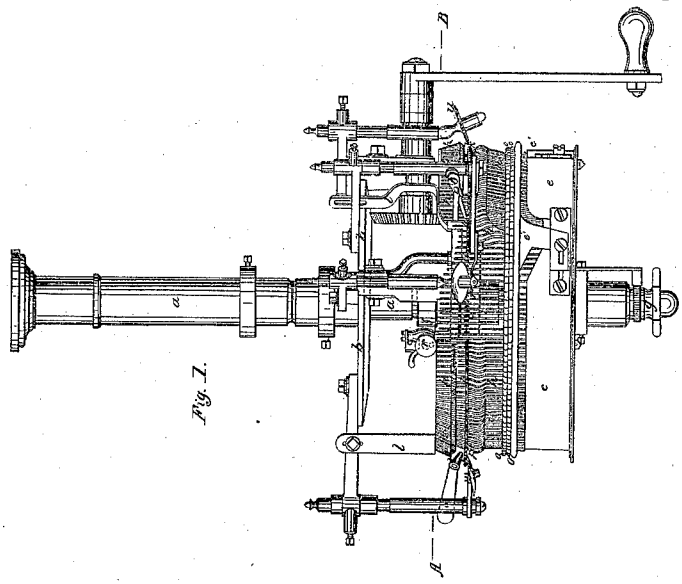


Fig. 1.

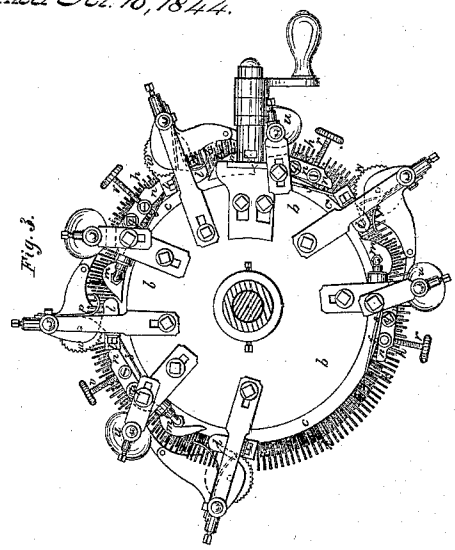


Fig. 3.

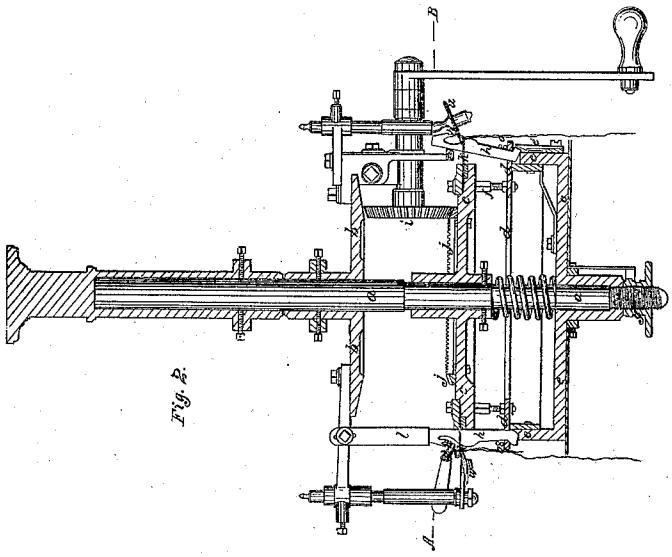


Fig. 2.

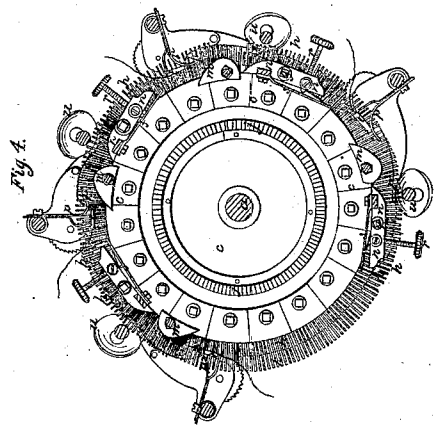


Fig. 4.

Inventor

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N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

Sheets, 2 Sheets.

P. E. Ladrange.

Knitting Mach.

No. 3,798. Patented Oct. 16, 1844.

Fig. 1.

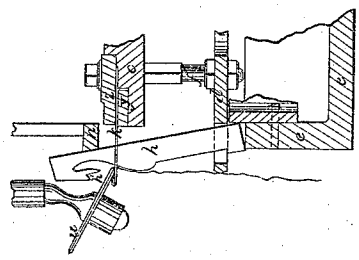


Fig. 2.

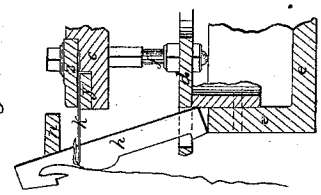


Fig. 7.

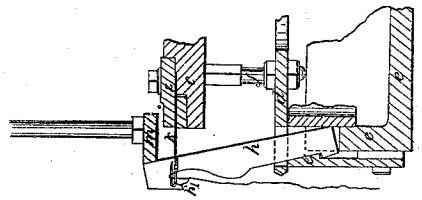


Fig. 8.

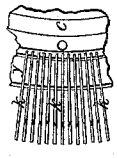


Fig. 9.

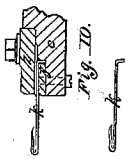


Fig. 6.

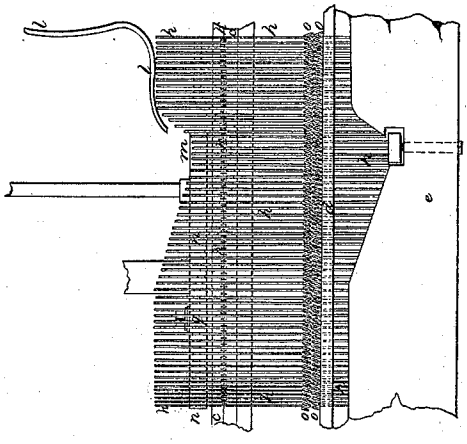
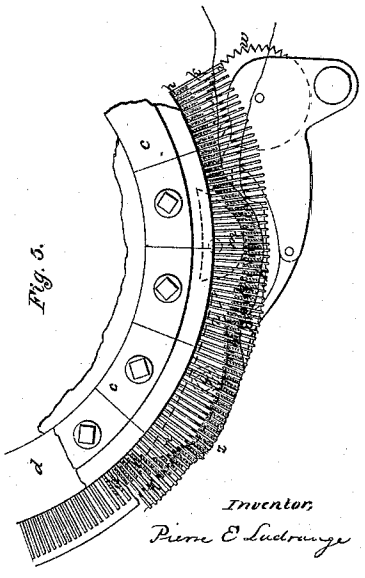


Fig. 5.



Inventor,
Pierre E Ladrange

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

PIERRE E. LADRANGE, OF VIGNORY, FRANCE.

KNITTING-LOOM.

Specification of Letters Patent No. 3,798, dated October 16, 1844.

To all whom it may concern:

Be it known that I, PIERRE EMANUEL LADRANGE, of Vignory, France, have invented Improvements in Machinery or Apparatus for Knitting, of which the following is a specification.

This invention of certain improvements in machinery or apparatus for knitting consists in the construction and employment of certain apparatus and the arrangements thereof in conjunction with suitable mechanism as hereafter described for producing loops or meshes which being continued form the knitted work or fabric and in order that the invention may be perfectly understood, I have shown in the accompanying drawings various views of the machine and some of its parts detached in which its construction and operation is distinctly shown.

In Figure 1, is a side elevation of the whole machine complete, and Fig. 2 is a vertical section taken through the middle of the same. Fig. 3 represents a plan or horizontal view of Fig. 1 and Fig. 4 is a horizontal section or sectional plan taken through the line A B of Figs. 1 and 2.

The machine which is of a circular form is suspended from the roof or from a strong beam by means of the vertical shaft or circle *a a* and is composed principally of the four following parts to which the minor portions of the machine are connected. These four principal parts consist of four plates *b c d* and *e* seen best in the sectional view Fig. 2. The first plate *b b* is firmly secured to the vertical shaft *a a* in any convenient manner and is intended to support various stationary parts of the apparatus that act upon the needles and jacks or sinkers as will be hereafter described, and is therefore denominated the support plate. The second plate *c c* is called the needle plate because the needles are ranged radially around its circumference as seen in the sectional plan view Fig. 4 and also in the detached figures. This plate is mounted loosely on the vertical shaft *a a* and revolves freely around it and is connected with the third plate *d d* by means of the bolts and nuts *f f* in Fig. 2. This plate *d d* which is made in the form of a broad ring is furnished at or near its periphery with long slits or openings (see detached view Fig. 5) which receive the jacks or sinkers and maintain them in a perpendicular position. From the circumstance of this plate being thus perforated with long slits or openings it is called the "comb plate."

The fourth plate is shown at *e e* and is firmly fixed to the vertical shaft *a* by screws or otherwise but is capable of being raised up and down and its height thereby regulated (when required) by means of the screw box *g* below as seen in Figs. 1 and 2 and the helical spring seen in Fig. 2 the position of the railway plate requiring adjustment according to the fineness and coarseness of the thread and the elasticity which the knitted fabric is to possess.

The plate *e e* is called the railway plate because an undulating rib or rail which is formed on its upper surface supports the lower ends of the jacks or sinkers *h h* and by means of the undulations formed thereon which in the machine as represented are four in number, the action of the sinkers as seen in Fig. 1 and Fig. 6 is regulated.

From the foregoing it will be understood that the top and bottom plate *b* and *e* or as they may be called the "support plate" and "railway plate" are stationary being fixed to the vertical shaft *a a* as before stated, and that the "needle plate" *c* and "comb plate" *d* which are connected together by the bolts *f f* revolve freely around the shaft *a a*. Rotary motion is communicated to them by means of the bevel pinion *i i* on the cranks shafts, which pinion gears into a circular bevel wheel *j j* attached to the upper face of the needle plate *c c* as seen in Figs. 2 and 4.

As these plates revolve and carry around with them the needles *k k* and sinkers *h h* these latter are made to fall and rise in the perforations of the comb plate and between the needles of the needle plate according to the undulations formed on the upper surface of the railway plate, but as these sinkers might not always descend by their own weight at the proper time they are made to do so by coming into contact with and passing under the inclined end of the metal piece *l l* see Figs. 1, 2 and 6. When the sinkers have passed down (as shown in Fig. 6) the inclined plane of the railway plate they are kept down by the angle piece e^1 Figs. 1 and 7 which catches on a ledge on the front part of the sinker as seen in Fig. 7. The requisite outward motion of the sinkers between the needles to form the loop is effected by the cam pieces *m m* and *n n* Fig. 4 which are supported from the plate

b b above as seen in other figures. When the sinkers have passed in front of these cams they are forced back into their original positions by the helical springs *o* as seen in Figs. 1, 2 and 6 which surrounds them and also by the pressing pieces *p* and *p** as seen in Figs. 4, 5 and 6. The cam pieces *n n* are mounted on centers at 9 Figs. 3 and 4 and the distance that the sinkers are forced out by them is regulated by means of the screw *r* which passes through a block on the same and abuts against a stationary piece *s* seen best in Figs. 3 and 4.

The motions of the sinkers it therefore appears are then regulated as follows: the upward and downward or vertical motion in the comb plate by the undulations on the railway plate, and the outward motions between the needles of the needle plate by the cams *m* and *n* the backward motion by the spring *o* and pressing pieces *p* and *p**. The threads of which there are four in this machine to form the work enter the trumpets *t t* Figs. 2 and 4 and are conducted by them under the front notches *h* h* h** of the sinkers *h h h* Fig. 7 and laid along the needles as seen in Fig. 4. The front notch of the sinkers having taken hold of the thread during the descent of the sinker between the needles down the inclined plane in the railway plate a loop hanging down between the needles is formed and at the same time the sinker is pressed forward between the needles by coming into contact with the cam *m* and thereby the loop is carried under the beak or beard of the needles as shown at Fig. 7. It will be observed in Fig. 6 that after the sinkers have descended the inclined plane of the railway as already described and before they begin to ascend the opposite incline as hereafter described they pass along a horizontal portion which is represented in the drawing Fig. 6 as capable of being adjusted by a screw this however is not essential to the machine the adjustment of the sinkers as to the height of the machine is accurately constructed being made by the screw box *q*, as above described.

When the lower end of the sinker comes into contact with the opposite incline see Figs. 1 and 6 it is raised and is also pressed back by the pressing piece *p** which forces back the work and the sinker into the recess between the two cams *m* and *n* which is shown by dots in Fig. 5. The effect of this will be that as the sinker *h* passes up the inclined plane on the railway plate the notch of the sinker will be raised out of the loop and as the sinker is pressed back by the piece *p** the point 1 Fig. 7 catches hold of the work and draws it back from under and beyond the beak or beard of the needle which is then closed by coming under the revolving presser plate or roller *u* as seen in Fig. 11. Then the sinker in continuing its progress is brought against the cam *n n* which gradually forces it outward and by the projecting shape of its breast pushes the work over the beard of the needle which has been closed for this purpose by the presser plate *u* and ultimately throws the loop of the work already made over the end of the needle and thereby over the loop which has just been made as seen in Fig. 12 and *z* Fig. 5 and which loop remains at the end of the needle until another loop is made by the next two needles. When the work is thrown over it is pressed back by the notched wheel *w* and the sinkers are brought into their original position by the springs *o* already mentioned.

The construction of the needles and the manner of fixing and securing them in the needle plate so that they can be changed or removed at pleasure is distinctly shown at Figs. 8, 9 and 10. The inner end of the needles is bent down and enters a circular groove made by screwing a brass ring *y* into the needle plate near its periphery. The shafts of the needles lie radially around the needle plate in grooves or notches made on the upper side of the brass ring *y* as seen in Fig. 8 and the needles are firmly secured in their proper places by means of the sector pieces *z* which are screwed lightly down to the needle plate. A ring of leather felt pasteboard or other suitable substance is placed between the sector pieces *z* and the needles and thereby holds the needles more firmly.

Having now described the invention and the manner of carrying the same into effect it is scarcely necessary to point out to any one acquainted with the construction of machines that the form and construction of this machine admits of considerable variation and many of the operations may be performed by other mechanical devices. I therefore do not confine myself to the precise arrangements and construction of parts herein shown nor do I claim the exclusive use of the several parts except as hereinafter mentioned unless the said several parts be used in the construction and working of a machine as hereinbefore described for producing knitted work or fabrics. But

I do claim—

1. Arranging the hook billed needles, such as are used in the formation of stocking net and all other fabrics netted radially around a circular plate, or disk, or ring as herein described.

2. I claim the sinkers in combination with the comb plate provided with radial slots through which the sinkers pass, and by which they are guided, as herein described.

3. I claim the disk in combination with the needles; for closing the beaks of the needles preparatory to casting off the old loops over the points of the needles as described.

4. I claim the arrangement of the cam pieces *m m* and *n n* to throw out the sinkers, and in combination with these I claim the pressing pieces and helical springs for forcing back the sinkers as herein described.

5. I claim the method of working the sinkers up and down in the circle by means of the undulating rib or rail in combination with the sinkers.

6. I also claim the combination together of all the elements enumerated in the foregoing claims whereby I am enabled to knit continuously around a circle as described.

P. E. LADRANGE. [L. S.]

In presence of—
S. VIERARD,
C. BAL.