(No Model.) 2 Sheets—Sheet 1.

M. H. PEARSON.

SEWING MACHINE.

No. 479,838. Patented Aug. 2, 1892.

Fig. 1.

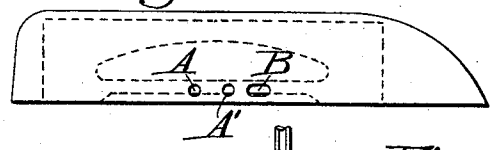


Fig. 2.

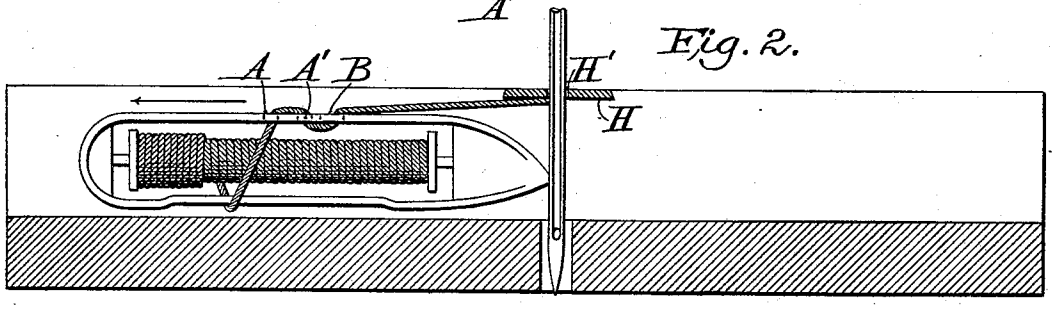


Fig. 3.

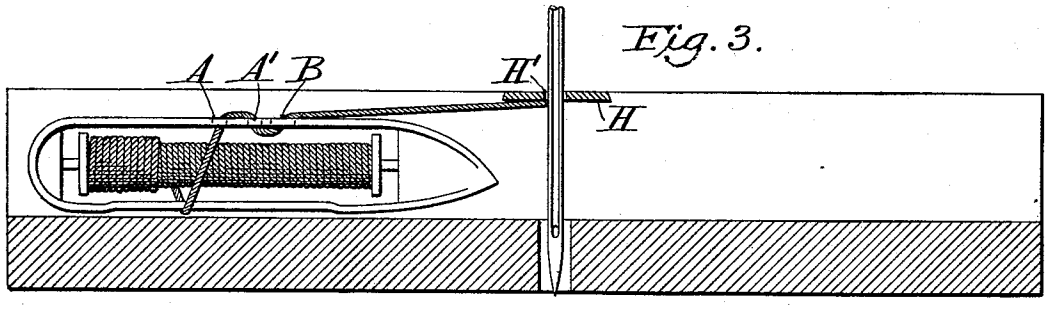


Fig. 4.

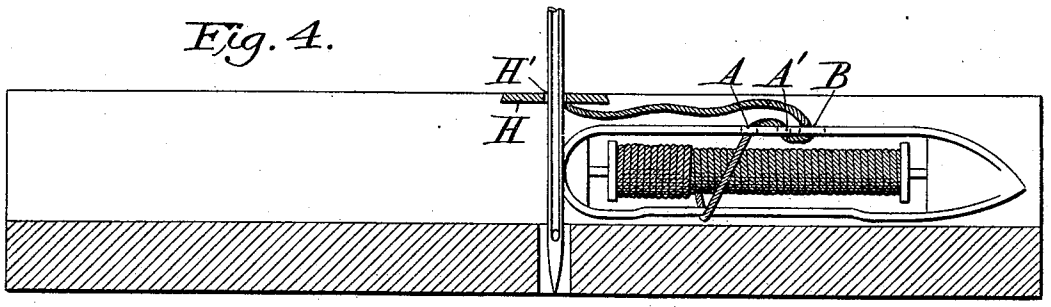
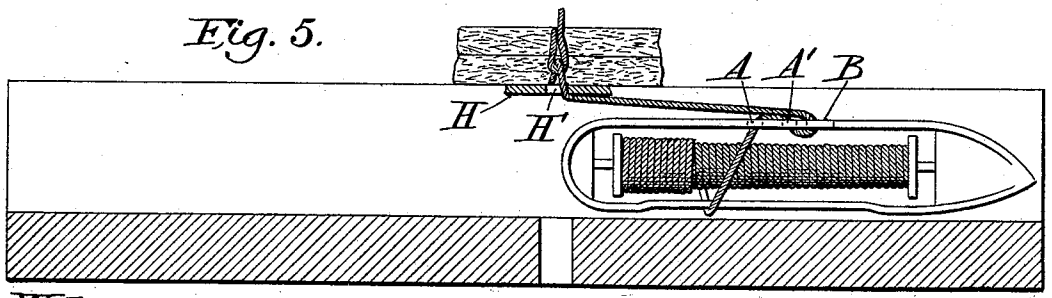


Fig. 5.



Witnesses
James F. Duhamel
Horace A. Dodge.

MARSHALL HENRY PEARSON,
Inventor,
by Dodges & Sons Attys.

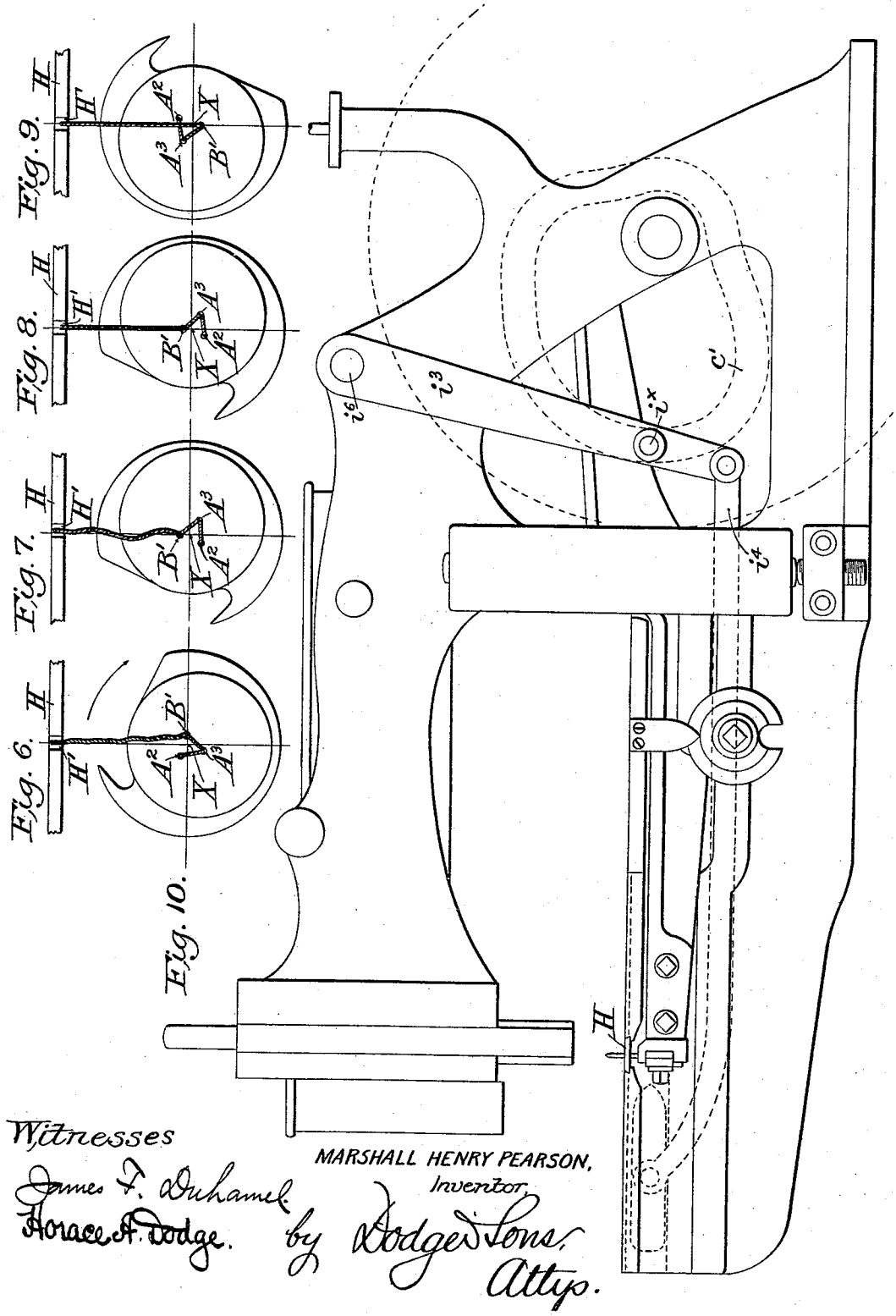
(No Model.)

2 Sheets—Sheet 2.

M. H. PEARSON.

SEWING MACHINE.

No. 479,838. Patented Aug. 2, 1892.



Witnesses
James F. Duhamel.
Horace A. Dodge.

MARSHALL HENRY PEARSON,
Inventor,
by Dodge & Sons,
Attys.

UNITED STATES PATENT OFFICE.

MARSHALL HENRY PEARSON, OF LEICESTER, ENGLAND, ASSIGNOR TO THE JOHN O'FLAHERTY COMPANY, OF MONTREAL, CANADA.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 479,838, dated August 2, 1892.

Application filed October 30, 1891. Serial No. 410,345. (No model.) Patented in England June 28, 1889, No. 10,481.

To all whom it may concern:

Be it known that I, MARSHALL HENRY PEARSON, a citizen of England, residing at Leicester, in the county of Leicester and Kingdom of England, have invented certain new and useful Improvements in Sewing-Machines, (for which I have received British Patent No. 10,481, dated June 28, 1889,) of which the following is a specification.

This invention relates to sewing-machines; and it consists in a novel construction and arrangement of the parts whereby the thread required to form a stitch is drawn from the shuttle during the backward movement of the latter.

The advantages of this invention are—

First. Whereas with previous forms of shuttles the needle-thread when drawing the shuttle-thread into the material has also to draw the requisite amount of shuttle-thread from the shuttle, thus causing an unnecessary amount of strain on the needle-thread, with my invention the necessary quantity of shuttle-thread has been previously withdrawn from the shuttle and the needle-thread has simply to draw the shuttle-thread into the material without having the additional duty of drawing the thread from the shuttle.

Second. By reason of the foregoing less tension is required for a given tightness of sewing than when other shuttles are used, and conversely lighter sewing can be obtained with a given tension on the shuttle-thread.

Third. It is well known among sewing-machine experts that the amount of tension on the shuttle-thread cannot be made absolutely constant or uniform, and that a slight irregularity in such tension will destroy the uniformity of the sewing; but with my invention such irregularity of tension does not affect the uniformity of the sewing in anywise whatever, the shuttle-thread being practically locked when the before-mentioned loose thread has been drawn into the material.

Fourth. Instead of having to adjust the tension of both needle and shuttle threads, as in the case when other shuttles are used, with my invention only the tension of the needle-thread has to be adjusted.

Fifth. When other forms of shuttle are used, the distance to which the shuttle-thread is drawn into the material varies somewhat according to the relative tensions on the needle and shuttle threads, and usually it is drawn up to about the center of the thickness of the material being sewed. When any but the thinnest material is being sewed this causes the shuttle-thread to be used up quickly, thus entailing loss of time by winding reels or cops and placing such reels or cops in the shuttle; but when the shuttle is made according to my invention the distance to which the shuttle-thread is drawn into the material is contant, and may be made as small as is consistent with good sewing, thus economizing the time by making a given quantity of shuttle-thread sew a greater length of material than by the old method.

Sixth. As the "feed" of the material takes place after the stitch has been tightened and before the thread for the next stitch is drawn from the shuttle, the length of the stitch does not affect the distance the thread is drawn into the material, the amount of thread given off by the shuttle being that required for drawing into the material plus the length of the next stitch, irrespective of what the length of such stitch may be.

In the accompanying drawings, Figure 1 is the plan of a reciprocatory shuttle of the ordinary boat-shaped type, showing the holes A A′ for the tension and the thread-delivery hole B. Fig. 2 is a section through a shuttle-box, showing the shuttle after the feed has taken place and as it is about to give off the requisite amount of shuttle-thread for the next stitch. Fig. 3 shows the same shuttle after it has given off the thread and when it is at the extreme limit of its movement in the direction shown. Fig. 4 shows the same shuttle when it, having passed through the loop in the needle-thread, is remaining stationary until the needle-thread has drawn the slackness observable in the thread into the material being sewed. Fig. 5 shows the same shuttle after the slack has been drawn into the material and as it is just about to begin its movement toward the left. Fig. 6 is a view of an oscillating shuttle, showing the holes A^2 A^3 for the tension and the thread-delivery

hole B′, the position shown being that occupied by the shuttle as the point is about to enter the loop in the needle-thread. Fig. 7 shows the same shuttle after it has passed through the loop and is remaining stationary until the needle-thread shall have pulled the slackness observable in the thread into the material being sewed. Fig. 8 is a view of the same shuttle after the loose thread has been drawn into the material and as the shuttle is about to begin its return movement. Fig. 9 shows the same shuttle as it has just given off sufficient thread for the next stitch, and Fig. 10 a side view of so much of a sewing-machine as is necessary to show the means for imparting motion to the shuttle.

I will now proceed to describe the manner in which I apply my invention, first, to a reciprocating shuttle, and, second, to an oscillating shuttle.

My invention may be applied to any form of reciprocating shuttle employing either reels or cops; but I prefer to use the form of shuttle shown in Figs. 1, 2, 3, 4, and 5—that is, with a bar formed in the lower side of the shell, as is seen by the dotted lines in Fig. 1. In the upper side of the shell I form a series of holes of any number, as shown at A A′ B, Fig. 1, &c. Of these holes all except the thread-delivery hole B may be in any convenient position; but the hole B must be located so that it will be a predetermined distance nearer to the hole H′ in the needle-plate H (through which the needle passes) when it has completed its movement in the direction in which it passes through the loop in the needle-thread, as in Figs. 4 and 5, than it is when it has completed its movement in the opposite direction, as in Fig. 3. In order that the effect of thus locating the said thread-delivery hole may be fully understood, let us conceive that the shuttle is in the position shown in Fig. 4, and that the shuttle-thread has been drawn up into the material. The shuttle will then be moved by suitable mechanism to the position shown at Fig. 2, and the portion of thread situated between the thread-delivery hole B and the opening H′ in the needle-plate taut, because the distance between the holes B and H′ is the same as when the shuttle was in the position shown in Fig. 4, minus the amount of thread drawn through the hole H′ by reason of the material having been "fed" the length of a stitch; but the shuttle has still a predetermined distance to travel in the direction it is moving, as shown by the arrow in Fig. 2, and as one end of the shuttle-thread is held fast by the needle-thread in the material it follows that the shuttle-thread must of necessity give off the required amount of thread to complete its movement in the said direction, as shown in Fig. 3. The direction of the movement of the shuttle is now reversed, and passing through the loop in the needle-thread it again reaches the position shown in Fig. 4, and as the shuttle has given off a certain amount of thread since it previously occupied this position it follows that the portion of thread between the thread-delivery hole B and the opening H′ in the needle-plate H will be loose or slack and will allow of its being freely drawn into the material being sewed.

Owing to the thread being passed through the series of holes A A′ B, as shown in Figs. 4 and 5, the needle-thread cannot draw any further amount of thread from the shuttle, and so is constrained to draw upon its own supply for the completion of the stitch after the before-mentioned slackness in the shuttle-thread has been used up.

The difference in the distances between the holes B and H′ when the shuttle is in the two positions, as shown in Figs. 3 and 4, is equal to twice the distance it is required that the shuttle-thread shall be drawn into the material. Thus if it is required that the shuttle-thread shall be drawn into the material one-eighth of an inch I so locate the thread-delivery hole B that it will be one-quarter of an inch nearer to the hole H′ when the shuttle is in the position shown in Fig. 4 than it is when the shuttle is in the position shown in Fig. 3.

The thread-delivery hole B may be of any convenient shape; but I prefer to make it of an elongated shape, as shown at B, Fig. 1, as it then has a tendency to lock the shuttle-thread as the loose portion is being drawn into the material, as in Figs. 4 and 5, but allows it to pass more freely from the shuttle when the shuttle is moving from the position shown in Fig. 2 to that shown in Fig. 3.

Motion is imparted to the shuttle by means of a rod i^4, connected to the lower end of a pendulum-lever i^3, pivoted at i^6 to the bracket-arm of the machine and having a stud or finger $i^\times$, adapted to work into a cam-groove c'. (Shown in dotted lines in Fig. 10.) I do not wish, however, to restrict myself to this particular construction of mechanism for actuating the shuttle, as other and equivalent means will obviously be employed, according to the style or type of machine to which the invention is applied.

In a shuttle of the oscillating type, as shown in Figs. 6, 7, 8, and 9, I form a series of holes in the shell or cover of the shuttle, as at A^2 A^3 B′. Of these holes all except the thread-delivery hole B′ may be in any convenient position; but the hole B′ must be located so that it will be a certain predetermined distance nearer the opening H′ in the needle-plate when the shuttle is in the required position for the shuttle-thread to be drawn into the material, as shown in Figs. 7 and 8, than when the hole B′ is at its maximum distance from H′, as shown at Fig. 9.

The shuttle shown in Figs. 6, 7, 8, and 9 is assumed to oscillate round the axis X. Therefore the hole B′ will be at its maximum distance from H′ when B′, H′, and the axis X

are in the same plane and when B′ and H′ are upon opposite sides of the axis X, as shown in Fig. 9.

Although for the purpose of description I have assumed the thread to be tensioned or locked by being passed through the holes A A′ A^2 A^3, I wish it to be plainly understood that other devices may be employed for accomplishing the same object.

From the foregoing description and accompanying drawings any one with a fair knowledge of the mechanism of sewing-machines should be able to apply my invention to any form of sewing-machine that employs a needle and shuttle.

Having thus described my invention, what I claim is—

1. The combination, in a sewing-machine, of a frame or plate having a needle-opening, a shuttle provided with a hole for the delivery of the thread, and mechanism, substantially such as shown and described, for imparting motion to said shuttle and adapted to carry the thread-delivery hole of the latter to a greater distance in rear of the needle-hole than in front of the same, whereby the thread required to form a stitch is drawn from the shuttle during the backward movement of the latter.

2. In a sewing-machine, the combination, with a frame or plate H, provided with a needle-hole H′, of a reciprocating shuttle provided with a thread-delivery hole B, and means, substantially such as shown and described, for actuating the shuttle and carrying its thread-delivery hole B farther to the rear side of the needle-hole H′ than to the other side.

In witness whereof I hereunto set my hand in the presence of two witnesses.

MARSHALL HENRY PEARSON.

Witnesses:
ARCHIBALD MACLAINE HARWAR,
FRED FELLOWES WIGGINS.