

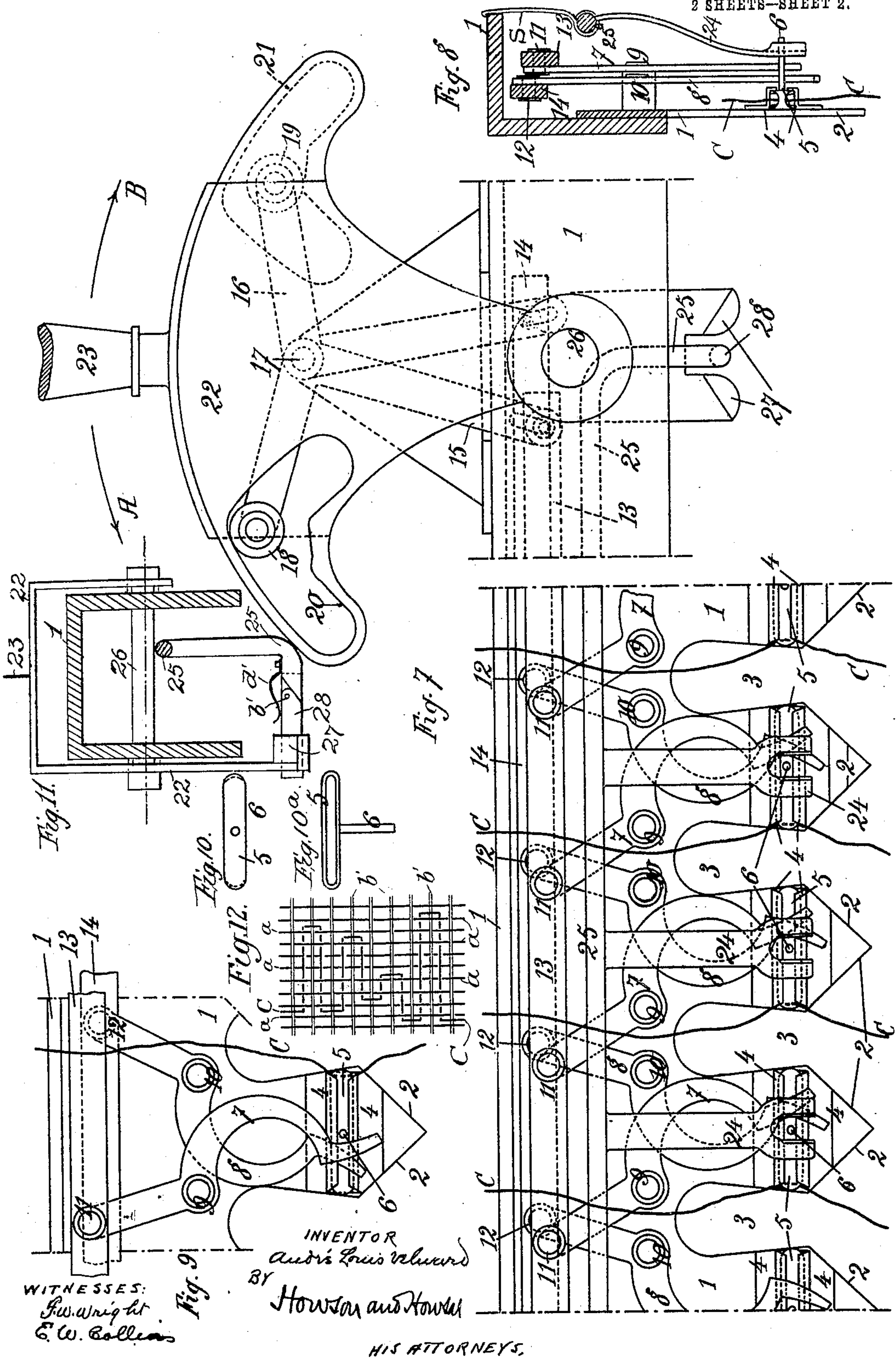
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APPARATUS FOR TAMBOURING.

APPLICATION FILED DEC. 17, 1903.

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WITNESSES:
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APPARATUS FOR TAMBOURING.

No. 804,072.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ANDRÉ LOUIS VELUARD, manufacturer, a citizen of the French Republic, and a resident of Frankford, Philadelphia, State of Pennsylvania, (whose post-office address is in care of James Bromley, Leiper and Adams streets, Frankford, aforesaid,) have invented certain new and useful Improvements in Apparatus for Tambouring,

of which the following is a specification.

This invention consists in the application to weaving-looms of all kinds, mechanical or otherwise, of arrangements enabling tambouring to be continuously made. Said arrangements may be operated mechanically wholly or in part.

In the manufacture of tambour-work as at present conducted the embroidering-thread is carried by pirns, which perform the work of tambouring and which only contain a somewhat short length of thread. It is therefore necessary to frequently stop the loom in order to replenish the embroidering-thread. By the present invention the embroidery-thread is stored to an indefinite length on a bobbin placed outside the loom, and it passes into a thread-guide, replacing the usual cam. The work may therefore be continuous.

In the accompanying drawings, Figures 1 to 6 are diagrammatic views showing the various stages of the operation. Fig. 7 is a front view, and Fig. 8 a transverse section, of means for carrying out the principle of the invention. Fig. 9 is a front view of a part of the mechanism in order to show the working. Figs. 10 and 10^a are separate detail front and plan views of one of the thread-guides. Fig. 11 is a sectional schematic view of a detail of the arm 25. Fig. 12 is a diagram illustrating, on an enlarged scale, the arrangement of the threads.

The principal part of the invention, Figs. 7 and 8, is supported by a frame 1, terminated toward the bottom by guide-surfaces 2, ending two by two at a recess 3. Toward the lower extremity of the frame 1 guide-slots 4 are arranged, in which slots guides 5, holding the embroidery-thread C, are adapted to travel. These thread-guides are provided with an operating-rod 6, Fig. 10, subjected to the action of operating-levers 7 and 8, pivoted, respectively, at 9 and 10 on the frame 1. The upper end of the lever 7 is connected by a spindle 11 to a bar 13, and the lever 8 is connected in a similar manner at 12 to a bar 14. It is evident that by pulling or pushing

the bars 13 and 14 an angular movement may be imparted to the levers 7 and 8, which pivot on their respective axes and act on the rod 6 of the thread-guides 5. The displacement of the bars 13 and 14 may be brought about by different means, preferably by connecting them with elbow-levers 15 and 16, pivoted at 17 and terminated at their free ends by rollers 18 19, intended to act in combination with cams 20 and 21, respectively. These two cams are mounted in a part 22, pivoting at 26 on the frame 1 and provided with an operating-handle 23. The form given to the cams 20 and 21 is such that while one series of levers is operated in order to actuate the thread-guides the other series is brought into the desired position for doing useful work when a fresh displacement of the handle 23 takes place, as will be hereinafter explained. The arrangement of the mechanism is completed by small forks 24, mounted on a rod 25, subject to the action of a spring S, which tends to maintain the said forks in contact with the mechanism. Each fork engages in repose a rod 6 of the thread-guides 5, and they are lifted by means of a double cam 27, attached to the part 22, which cam acts on a part 28, attached to the rod 25, so as to liberate the thread-guides 5 before each displacement of the levers 7 and 8.

As shown in Fig. 11, the end 28 of the rod 25 is bent inwardly and is provided with a pawl-like portion hinged at *b'* and depressed by a spring *d'*. This end 28 is located when the handle 23 is in the position of Fig. 7 between one of the cams 27, which are movable with the lever 23. Upon throwing the lever 23 to the left one of the cams 27 will ride upon the end 28 of the rod, turn the rod 25 against its spring S, release the forks 24 from the pins 6 of the guides 5, and permit the levers 7 and 8 to be operated, through the rods 13 and 14 and levers 15 16, to move the guides sidewise from one guide-surface 2 to the next adjacent one. When this movement of the guide has taken place, the lower face of the cam 27 will have been moved past and out of contact with the rod 28, when the spring S will immediately return the forks 24, so as to interlock with pins 6 of the guides to prevent their accidental displacement by tension on the embroidery-thread or other cause as the frame and guides are inserted into or withdrawn from the shed. In returning the handle to its mid-position the spring *d'* will yield to allow the upper surface of cam 27 to return without operating the rod 25.

The working of the apparatus is as follows: Fig. 7 shows the mechanism at the moment when it is to be set in movement by the moving of the handle 23 in the direction indicated by the arrow A. The rollers 18 and 19 bear, respectively, on the opposite sides of the cams 20 and 21. In executing the movement indicated the bar 13 is drawn toward the right and levers 7 are displaced in such a way as to push each thread-guide 5 across the recess 3 into the slot 4, situated to the left of the one in which it was previously held. By returning the handle 23 to its initial position the levers 7 are turned back; but the cam 20 is arranged in such a way as to leave these levers to the left of the rods 6, with a view to a fresh operation of the apparatus. During this double displacement of the handle 23 the cam 21 has caused a slight movement of the bar 14, and consequently of the levers 8, which now occupy their working position.

Fig. 9 shows a part of the system as it appears after the movement of the handle 23 from the position shown in Fig. 7 to the left in the direction of the arrow A and back to its mid-position. When this latter is displaced in the direction indicated by the arrow B and then returned to a position of repose, the bar 14 is pushed toward the left, and the levers 8 cause the thread-guides 5 to pass to the right into the slides which contained them previously, while the cam 20 has again to bring the levers 7 into their working position, Fig. 7. It will be noticed that by reason of this movement the embroidering-thread C passes alternately to left and right of the recesses 3, sliding in the thread-carriers 5, which for this purpose have the form of an elongated ring, Fig. 10.

The mechanism just described is arranged on the weaving-loom, the guides 2 being directed downward above the warp-threads. In the position which is shown in Figs. 7 and 8 of the drawings it is adapted to be displaced vertically by a suitable driving mechanism, so as to come in contact with the warp-threads raised by the jacquard mechanism. These threads sliding against the said guides 2 enter fully into the recesses 3 over the whole width of the loom.

The threads C intended for making the tambouring and which pass into the guides 5 are not necessarily the same for all the parts. Each of them comes from a bobbin of variable size, arranged, for instance, at the rear of the loom and having any suitable tension mechanism.

The fabric is obtained in the following way, of course assuming that the loom is already working. In the following explanations reference will be made to Figs. 1 to 6, in which the letter D indicates the special arrangement hereinbefore described and a single element of which is shown, as all behave in the same manner.

First phase, first throw of the tambouring.—

The jacquard mechanism raises the warp-threads *a*, under which the embroidery-thread C, Fig. 1, is to pass, and then immediately the whole mechanism D is lowered, and the raised threads are then engaged in the recess 3. At this moment the thread-guide 5, which was at the left, is pushed to the right, Fig. 2, in the manner hereinbefore indicated. The embroidering-thread C following the movement is returned under the raised warp-threads, after which the whole mechanism D resumes its former position out of contact with the threads.

Second phase, first shuttle throw.—It will be noticed that by the displacement of the thread-guide 5 two lengths of the embroidering-thread start from this thread-guide, one ending at the fabric, the other directed toward the bobbin supplying the said thread. As it is necessary that the foundation pick be inserted between these two lengths, a special slay or reed *b*, arranged between the mechanism D and the lay *c*, must be introduced the moment the warp-threads separate for the passing of the shuttle between the lay and the usual slay or reed. The special slay or reed *b* raised by the jacquard mechanism then places itself between the two lengths of the thread C, Fig. 3, when the shuttle *d* is actuated in order to throw the bottom pick, after which the slay or reed *b* is lowered and resumes its initial position. For the first throw of the shuttle it is indispensable that in the entire width of the part of the warp where the embroidering-thread has worked (and this applies for each element D) only such threads are raised as have already been lifted by the preceding throw, (first throw of the tambouring.) In fact, it is easy to understand that if one or more of the threads which had not been lifted at the preceding throw were now lifted this thread or these threads would raise the two lengths of the embroidering-thread and bring them forward toward the finished fabric, thus rendering impossible the passage of the pick.

Third phase, second movement of the tambouring.—The jacquard mechanism, operating for the third time, raises the threads under which the thread C is again to pass, Fig. 4. The whole mechanism D is lowered and the thread-guide again pushed to the left, which lays the thread C between the two laps of the warp and releases the end coming from the bobbin. In order that this release may be complete, it is indispensable that all the threads which were lifted at the first movement of the tambouring and no others be lifted for this second movement. The thread C, which is simply retained by its crossing at the foundation pick, is returned in this manner into its primitive position, Fig. 5.

Fourth phase, second throw of the shuttle.—The whole mechanism D being raised, it lifts all the threads necessary for the production

of a foundation pick, Fig. 6, which is operated in the ordinary manner. Starting from this moment all the parts and all the threads are in the position shown in Fig. 1, and the four phases which have just been described are reproduced in a continuous manner.

In the enlarged diagram, Fig. 12, I have shown, by way of example, how an embroidering-thread C may be interwoven with the warps *a* and wefts *b'*. As will be seen from this diagram, the embroidering-thread C is held at the right by the introduced weft or foundation pick *b'*.

The slay or reed *b* should have straight or curved teeth. Its movements and also that of the mechanism D are obtained in all power-looms either by hand or by using the jacquard mechanism or by employing a special movement.

The important result obtained by the application of the invention is to allow of embroidering-threads of great length being employed, as the size of the feed-bobbins is not limited.

I claim as my invention—

1. In combination with the usual shuttle and lay and shed-forming mechanism of a loom, mechanism for the mechanical and continuous manufacture of embroidering, comprising guides for carrying an indefinite length of embroidery-thread from without the shed, into the shed, and means for moving said guides sidewise within the shed.

2. In combination with the usual shuttle and lay and shed-forming mechanism of a loom, mechanism for the mechanical and continuous manufacture of embroidering, comprising guides for carrying an indefinite length of

embroidery-thread from without the shed, into the shed, and means for moving said guide into and out of the shed, and means for moving the guide sidewise within the shed.

3. An embroidery-frame for a loom, comprising a frame adapted to be inserted into the shed, having guide-surfaces, between which the warp-threads may be held, in combination with guides each adapted to guide an indefinite length of embroidery-thread from without the shed, and means for moving said guide from one guide-surface to another.

4. An embroidery-frame for a loom, comprising a frame adapted to be inserted into the shed, having guide-surfaces, between which the warp-threads may be held, in combination with guides, each adapted to guide an indefinite length of embroidery-thread from without the shed, and means for moving said guide from one guide-surface to another, and forks adapted to interlock with said guides at such times as they are not being moved from one guide-surface to another.

5. A guide for an embroidery-frame for looms, consisting of a ring of elongated form for the passage of an indefinite length of thread, in combination with a frame adapted to be inserted into the shed and having guide-surfaces in which the guide may be retained, and means to pass the guide from one such surface to another.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDRÉ LOUIS VELUARD.

Witnesses:

CHARLES H. HOWSON,
JOS. H. KLEIN.