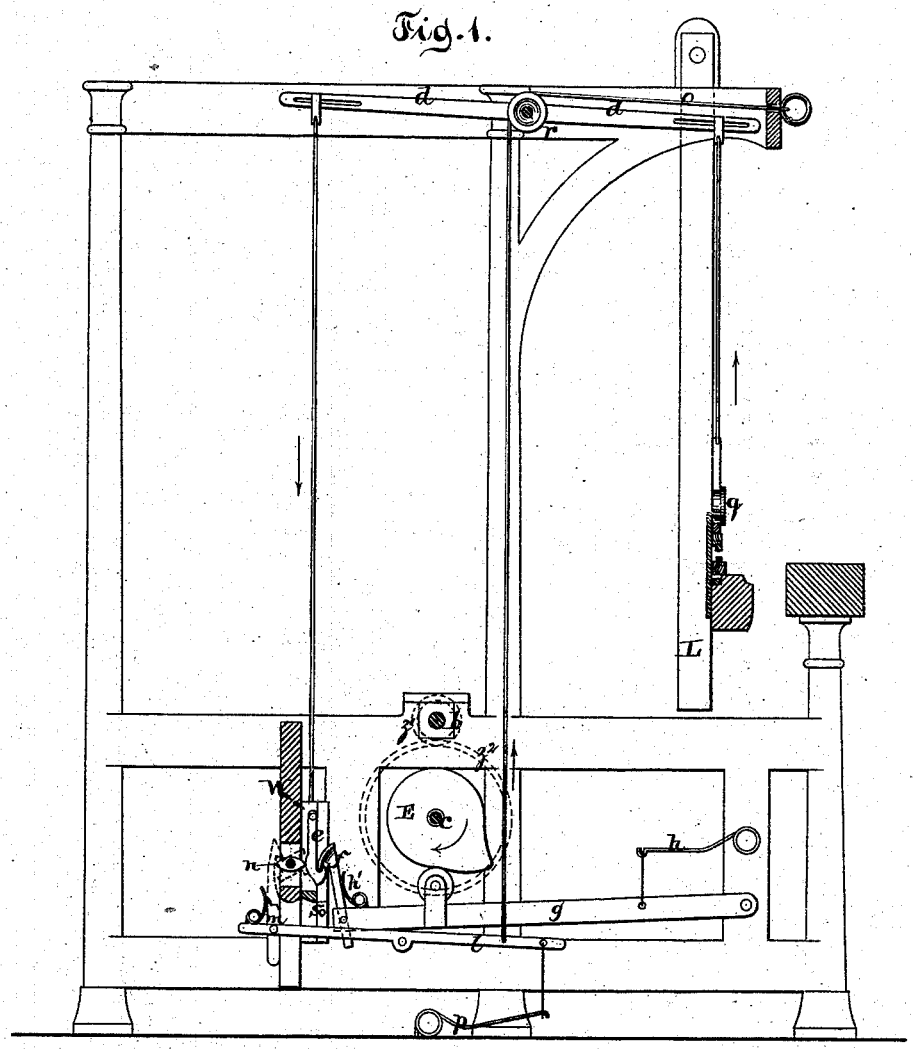
4 Sheets—Sheet 1.

R. MUELLER.

TAPE-LOOM.

No. 186,602. Patented Jan. 23, 1877.

Fig. 1.



Witnesses.
Otto Hufeland
Chas. Wahlers.

Inventor.
Robert Mueller
by
Van Santvoord & Hauff
his attys.

4 Sheets—Sheet 2.

R. MUELLER.

TAPE-LOOM.

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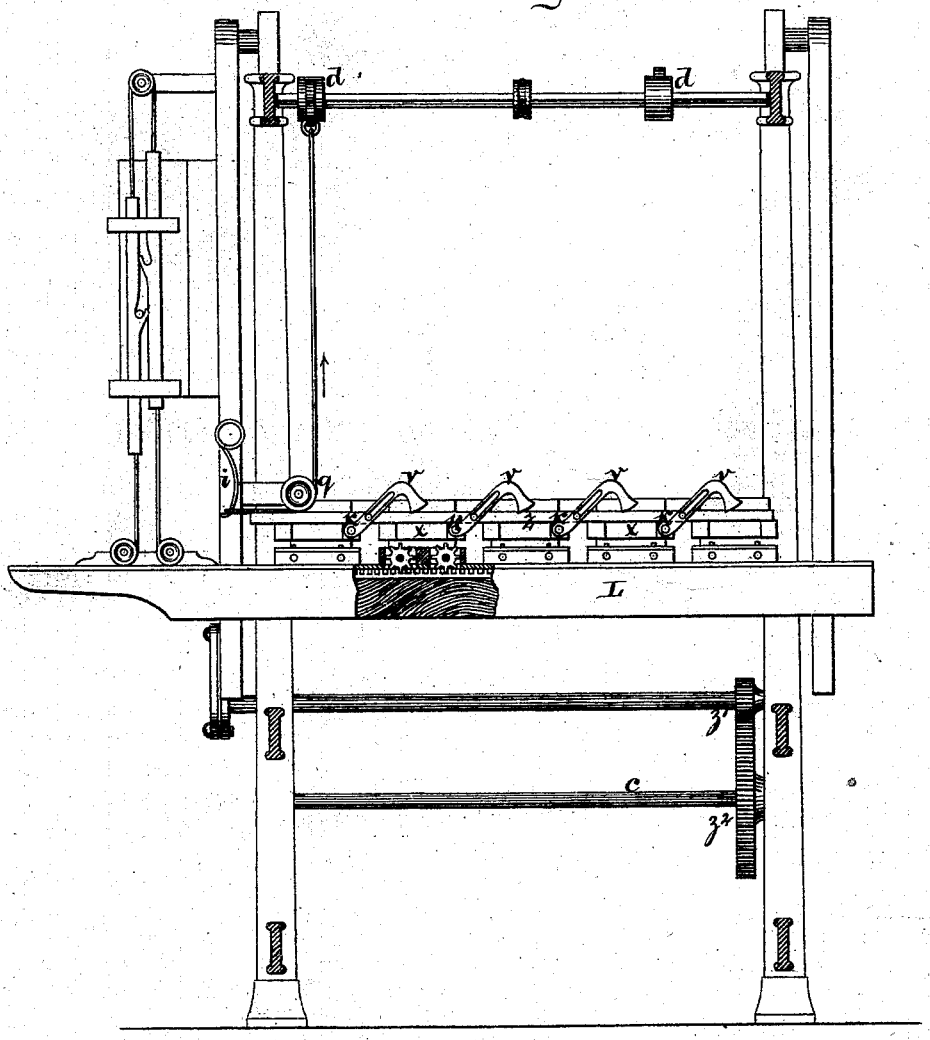
Fig. 2.



Witnesses.
Otto Kupland
Chas. Wahlers.

Inventor.
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TAPE-LOOM.

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Fig. 4.

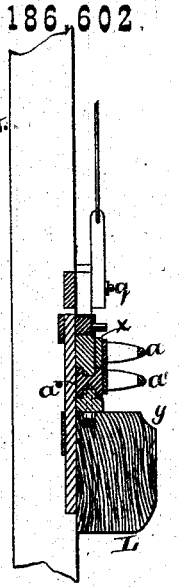


Fig. 3.

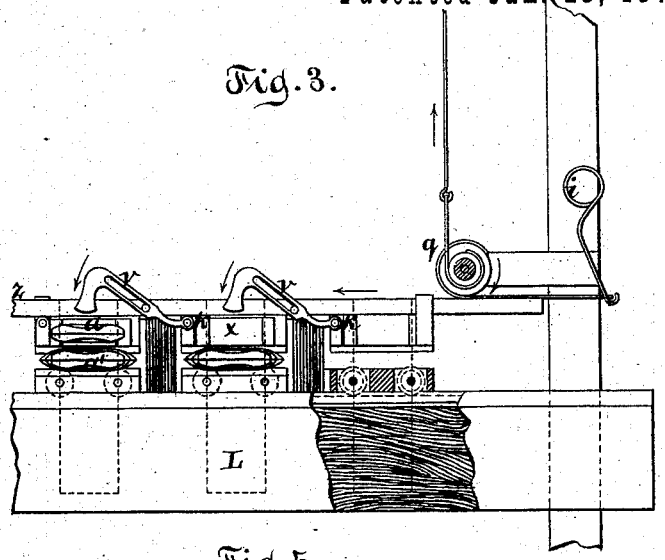


Fig. 5.

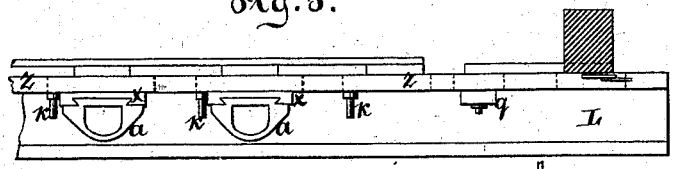


Fig. 6.

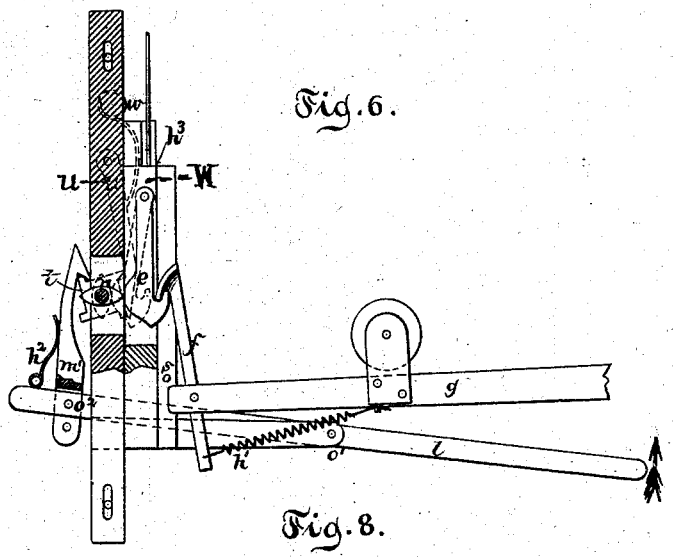


Fig. 7.

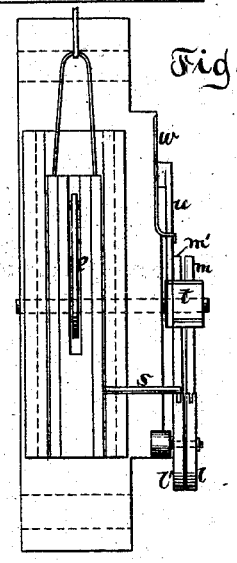


Fig. 8.

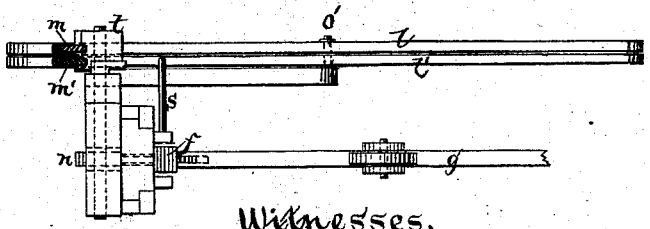
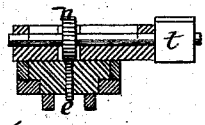


Fig. 9.



Witnesses.
Otto Hufeland
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R. MUELLER.

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Fig. 11.

Fig. 10.

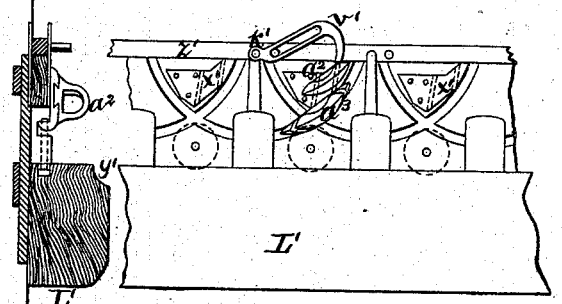


Fig. 12.

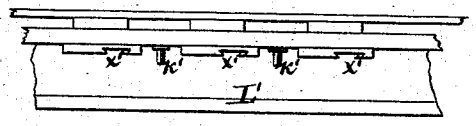


Fig. 17.

Fig. 18.

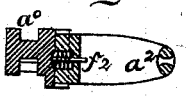
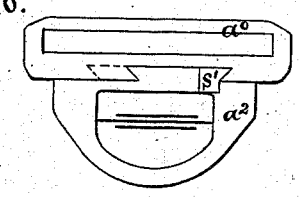


Fig. 16.



Witnesses.

Otto Hufland

Chas. Ohlers.

Fig. 15.

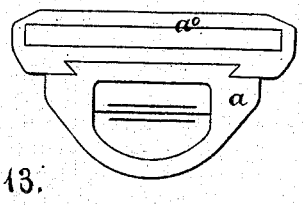


Fig. 13.

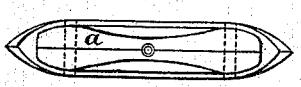
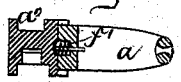


Fig. 14.



Inventor.

Robert Mueller

by

Van Santvoord & Hauff

his attorneys.

UNITED STATES PATENT OFFICE.

ROBERT MUELLER, OF COLLEGE POINT, NEW YORK.

IMPROVEMENT IN TAPE-LOOMS.

Specification forming part of Letters Patent No. **186,602**, dated January 23, 1877; application filed October 16, 1876.

To all whom it may concern:

Be it known that I, ROBERT MUELLER, of College Point, in the county of Queens and State of New York, have invented a new and useful Improvement in Tape-Looms, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a longitudinal vertical section. Fig. 2 is a front view, partly in section. The remaining figures are details on a larger scale than the previous figures, which will be referred to as the description progresses.

Similar letters indicate corresponding parts.

In tape-looms as heretofore constructed the operation of changing the weft-spools which have run empty for fresh ones during the progress of the work has to be performed by the attendant, and in order to change one spool, the entire loom has to be stopped; and since these changes have to be made at frequent intervals, they cause considerable loss of time, and the quantity of work produced by the loom is materially reduced.

The object of my invention is to avoid this loss of time by combining, with the loom, a mechanism which performs the operation of changing the weft-spools automatically, and without the necessity of stopping the loom, and without affecting the uniformity of the texture and the beauty of the work.

The mechanism which forms the subject-matter of my present invention consists of a slide, which is thrown out of gear automatically after each performance of its function, and of a shuttle combined with an ejector, the motion of which depends upon the slide above mentioned, and which serves to throw into action the full-spool carrier, and to eject the empty one, before the shuttle passes through the shed, and, consequently, without the omission of a single filling-thread.

In the drawings, the letter *b* designates the driving-shaft, from which motion is transmitted, by means of cog-wheels $Z^1 Z^2$, to the shaft *c*, on which is mounted the eccentric E. As this eccentric is turned round it acts on the lever *g*, which is forced up in contact with said eccentric by a spring, *h*. To the end of the lever *g* is pivoted a hook, *f*, which moves up and down by the action of the lever, and is pressed up against the slide W by a spiral spring, h^1. This slide connects, by means of a cord, with a lever, *d*, and it carries a latch, *e*. If this latch occupies the position shown in Figs. 1 and 6, the motion of the lever *g* is transmitted, through the slide W, to the lever *d*.

By referring to the drawing it will be seen that only the downward motion of the lever *g* is transmitted to the slide. When the lever moves upward, by the action of the spring *h*, the hook *f* slides over the latch *e*. This latch, however, occupies the position shown in Fig. 1 only when the cam *n* is in a horizontal position, but not when the same occupies the vertical position shown in dotted lines in Fig. 6. In the latter case the hook *f* passes the latch *e*, also, during its downward stroke, without imparting motion to the slide W. The mechanism, therefore, is out of action if the cam *n* occupies a vertical position. The position of this cam depends upon the position of a ratchet, *t*, secured on the same shaft. In the casing of the slide W is secured a pin, o^1, which forms the fulcrum for two levers, *l l'*, which carry at their rear ends hooks *m m'*, which catch over the lantern *t*, being supported by pivots o^2, and held in contact with the ratchet by a spring, h^2. The lever *l* can be turned in the direction of the arrow shown near it in Fig. 6 by a cord, *o*, which extends through the breast-beam, (see Fig. 1,) or for this cord, any other suitable device may be substituted; and by moving this lever in the direction above indicated, the ratchet is turned forty-five degrees, and then the lever is brought back to its original position by the spring *p*. The ratchet is retained by a stop-pawl, *u*, which is subjected to the action of a spring, *w*, so that said ratchet can only turn forty-five degrees each time it is moved. By this motion the position of the cam *n* is determined. Whenever it is desired to impart motion to the lever *d*, therefore, the attendant pulls the cord *o*, whereby the ratchet is caused to turn forty-five degrees, the cam *n* is brought into a horizontal position, and the latch *e* is pushed out. At its next downward stroke the hook *f* catches hold of the latch *e*, and the slide W is caused to move downward.

By a very simple contrivance the cam *n* is brought back to a horizontal position by the action of the slide itself. For this purpose a pin, *s*, is secured in the slide, (see Fig. 8,) which, when the slide moves downward, acts on the lever *l'*, situated on the side of the lever *l*, and the spring-dog attached to said lever causes the ratchet to turn forty-five degrees, and thereby the cam *n* is brought in a vertical position, allowing the latch *e* to fall back out of the path of the hook *f*. This hook is now free to move up and down without imparting motion to the slide, until, by pulling the cord *o*, the ratchet is again turned forty-five degrees. The attendant is thereby enabled to bring the mechanism in action whenever he desires, and after having acted once said mechanism throws itself automatically out of gear. The motion of the slide W is transmitted to the two-armed lever *d*, and through this lever to the pulley *g*. This pulley, Fig. 3, consists of two disks placed side by side. The smallest disk of the two connects, by a belt wound around it, with the lever *d*, while on the other disk is also wound a belt, which connects with a spring, *i*, and with a slide-bar, *z*. Whenever the slide W is thrown in gear, therefore, the pulley *g* is turned in the direction of the arrow marked near it in Fig. 3, and the slide-bar is moved. This bar extends throughout the entire length of the batten, and it is provided with pins, which serve to impart motion to ejectors *v*, which swing on pivots *k*.

Before proceeding any further I will now describe the construction of the shuttles.

In Figs. 3, 4, and 5 I have represented a batten with rectilinear shuttle-races; in Figs. 10, 11, and 12, one with curved shuttle-races. In both instances my invention can be applied without difficulty. In Figs. 13, 14, and 15 I have shown a shuttle for the rectilinear race, in about one-half of its natural size. Each shuttle is composed of two sections—viz., the back a^0 and the spool-holder *a*, the latter being made to fit into a dovetailed guide-groove in the former, and being retained in the desired position by a friction-spring. (Best seen in Fig. 14.)

On the upper part of the batten, above each shuttle-race, is secured a guide-box, *x*, Figs. 3 and 4, for the reception of the spool-carriers *a*, while in each of the shuttle-races is contained a shuttle-back, a^0, which also contains its spool-carrier. If the slide W is thrown in gear, and, consequently, the slide-bar *z* and the ejectors *v* are caused to move as indicated by the arrow in Fig. 3, the spool-carrier contained in the guide-box *x* is depressed, so that it takes the place of the spool-carrier contained in the shuttle-back a^0 beneath it, the latter spool-carrier being thrown out into a cavity, *y*, formed for its reception on the batten L. The spool-carrier thus ejected can be readily taken off, and furnished with a fresh spool for subsequent use. If one or more spools have given out, the attendant has nothing to do but to insert fresh spool-carriers above those which are nearly empty, and by pulling the cord *o* (which extends along the breast-beam, and can be reached from any position in front of the loom) the slide W is thrown in gear, so as to depress the fresh-spool carriers, and to eject those with the empty spools.

In all those places where no fresh-spool carriers have been inserted, the hooks *v* move down into the empty boxes *x* without producing any effect.

All these operations can be performed without stopping the loom.

By the spring *i* the slide-bar *z* and the hooks *v* are returned immediately to the position shown in Fig. 3, and by its action on the lever *d* the slide W is raised to its highest position. The eccentric E, Fig. 1, is mounted on the shaft *c* in such a position that it depresses the lever *g* at the moment when the shuttles occupy the position shown in Fig. 3, and consequently the action of the ejectors takes place during the time when the shuttles, after having passed their sheds, are at rest. The shuttles of the batten, with curved shuttle-races, are shown in Figs. 16, 17, and 18.

The method of changing the spool-carriers—that is to say, the operation of the slide-bar *z'* and the ejectors *v'*, Fig. 10—is precisely the same, as above described, in a batten with rectilinear shuttle-races.

The guide-boxes *x'*, Fig. 12, are modified to suit the construction of the curved shuttle-races. The dovetailed projection of the spool-carrier a^2, Figs. 16, 17, and 18, is placed obliquely toward the axis of the spool, and the shuttle occupies an oblique position, as shown in Fig. 10. The ejector *v'*, which swings on the pivot *k'*, strikes the spool-carrier a^2 at the point *s'*, Fig. 16, and as it depresses that spool-carrier which has been inserted in the box *x*, the spool-carrier beneath is ejected from its back.

From this description it will be seen that by my invention the operation of introducing shuttles or spool-carriers with fresh spools, and that of removing the shuttles or spool-carriers with empty spools, can be effected with the greatest ease and without stopping the loom.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a loom, of a shuttle-box, *x*, situated above the shuttle-race, with the shuttle-race, and with a shuttle made in two sections, the rear section fitting the shuttle-race, while the front section can be inserted either in the shuttle-box *x*, or in the rear section of the shuttle, substantially as set forth.

2. The combination, with the batten L, of a slide, W, which receives motion from the main shaft of the loom, a slide-bar, *z*, and ejectors *v'*, for the purpose of changing the shuttles in the batten, substantially as described.

3. The combination, with the slide W and

its latch *e*, of a cam, *n*, ratchet *t*, and levers *l l'*, the lever *l'* receiving its motion from the slide W, and serving to throw the latch *e* out of action, substantially as herein set forth.

4. The combination, in a loom, of a slide, W, with its latch *e*, cam *n'*, ratchet *t*, levers *l l'*, slide-bar *z*, ejectors *v*, shuttle-boxes *x*, and sectional shuttles *a a°*, all constructed and operating substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 12th day of October, 1876.

ROBERT MUELLER. [L. S.]

Witnesses:
W. HAUFF,
E. F. KASTENHUBER.