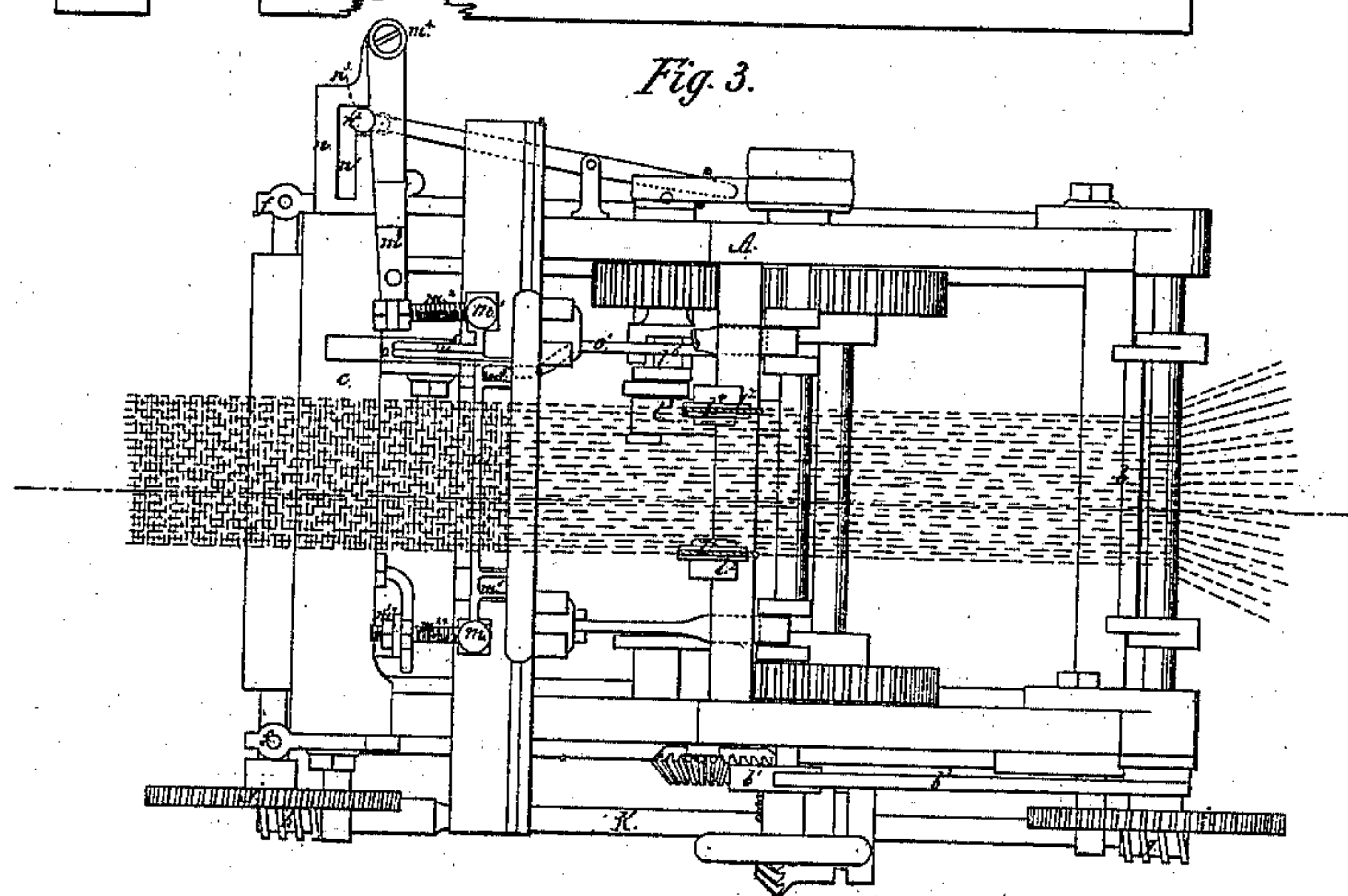
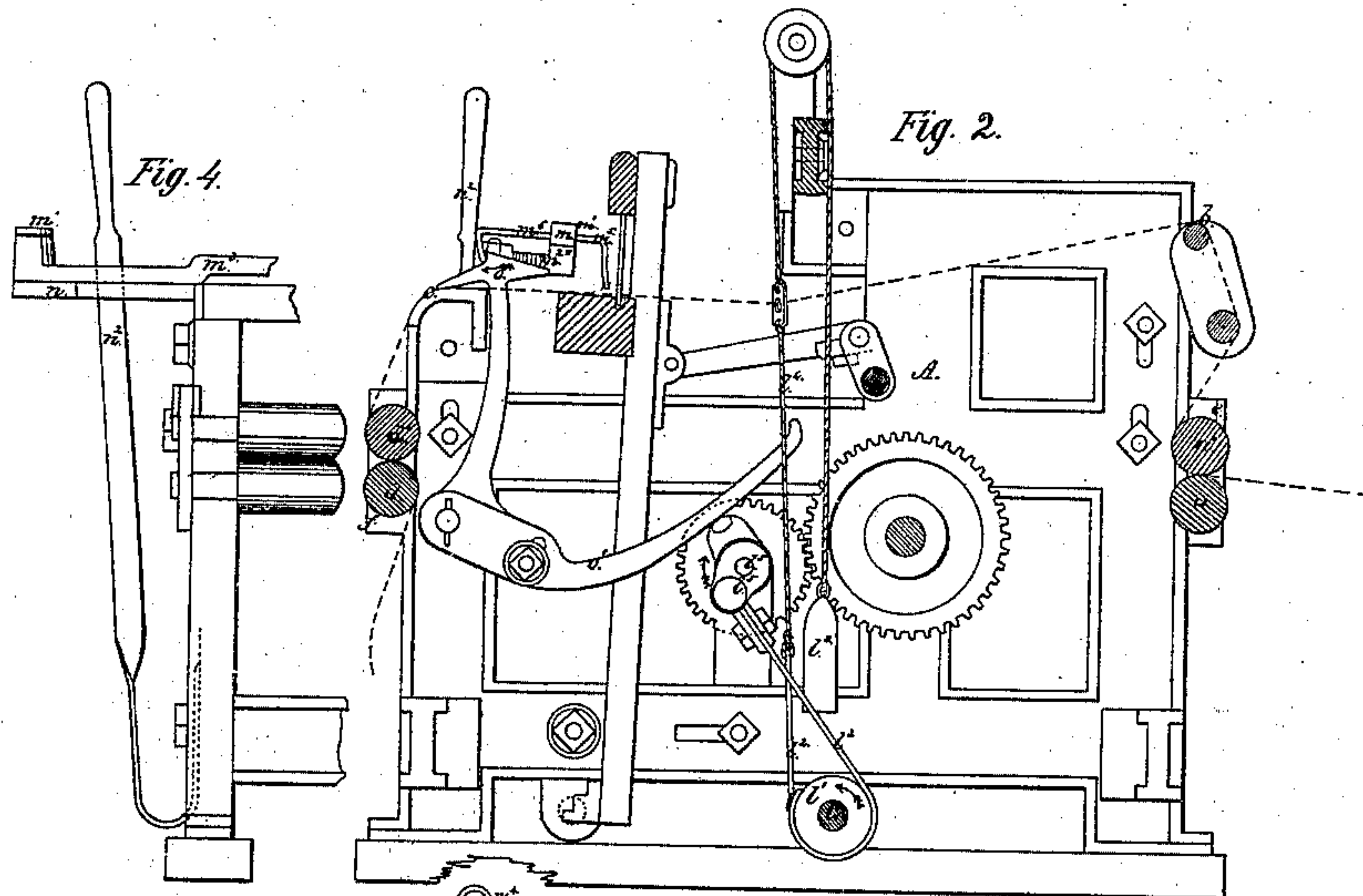
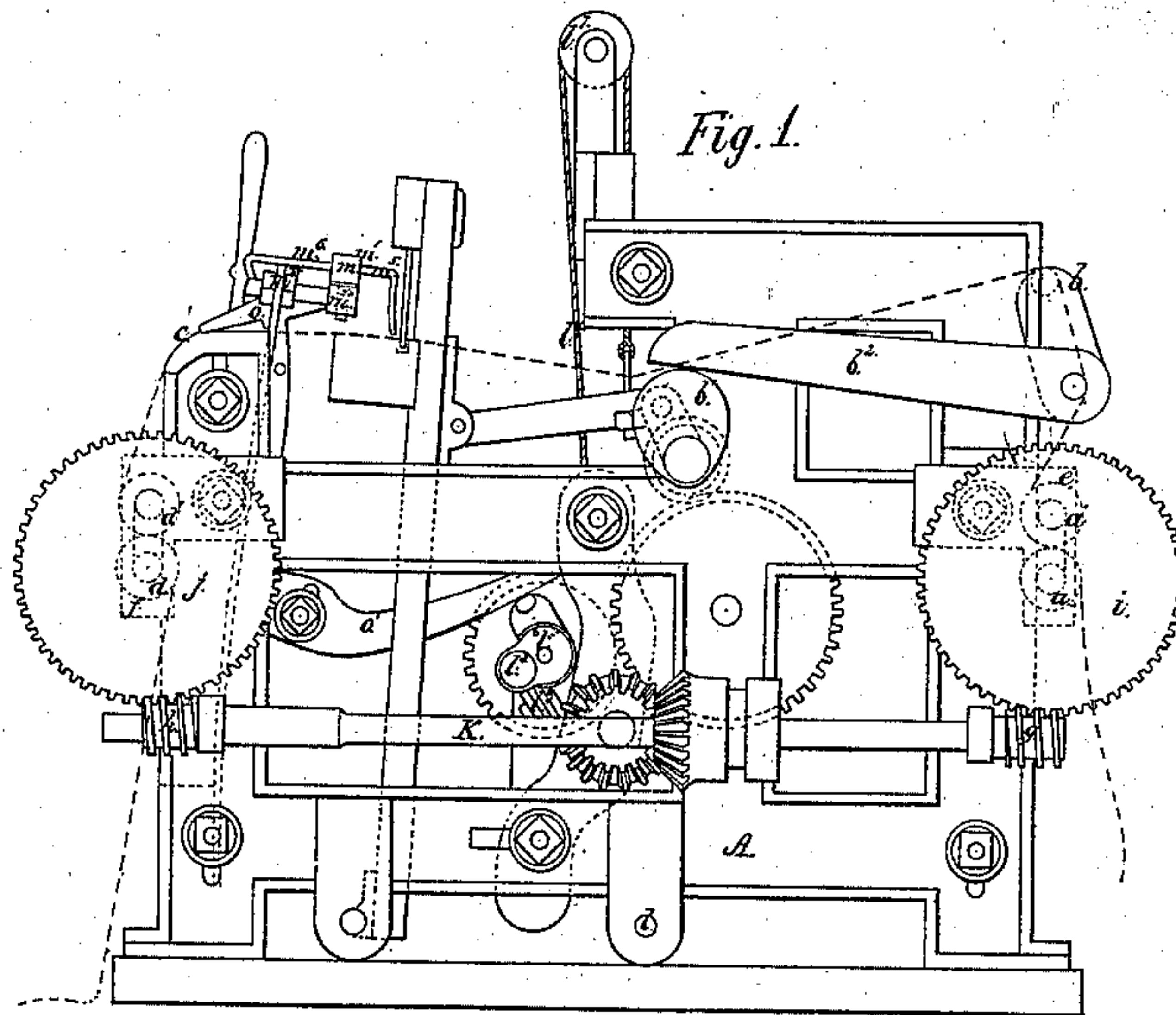


Loom.

N<sup>o</sup> 47,687.

*Patented May 9, 1865.*



Witnesses,  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN LOOMS.

Specification forming part of Letters Patent No. 47,687, dated May 9, 1865.

*To all whom it may concern:*

Be it known that I, WILLIAM TUNSTILL, of the city, county, and State of New York, have invented a new and useful Improvement in Looms; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of this invention. Fig. 2 is a longitudinal vertical section of the same, the plane of section being indicated by the line *x x*, Fig. 3. Fig. 3 is a plan or top view of the same. Fig. 4 is a detached elevation of the stop-motion.

Similar letters of reference indicate like parts.

This invention consists in the application of two endless screws gearing in worm wheels on the axles of the rolls, which carry the warp-thread and the finished fabric in such a manner that a positive and uniform strain is exerted on the fabric as well as on the warp-threads, and no back motion is possible, in combination with a peculiar shedding-motion, consisting of a rocking frame applied in combination with the rolls, delivering the warp-threads in such a manner that by the rocking motion of said frame yarn is given to the tread at the proper intervals, and the strain exerted on the warp-threads by the operation of producing the shed is materially reduced; further, in a peculiar device for producing the selvage on both edges of the woven fabric, by imparting to one or two threads at each side of the loom an up-and-down motion independent of the motion of the harness; also, in a peculiar double-stop motion, consisting of a rock-shaft which extends across the loom in front of the batten, and which is provided with two hooks, one at either end, to operate in combination with an oscillating dog and with the belt-shipper in such a manner that when the weft-thread breaks or gives out at either end of the shuttle-race the oscillating dog engages with the tail of one of the hooks on the rock-shaft, and the belt is changed, but if the weft-thread is intact in its place, the hooks, by coming in contact with the same, turn the rock-shaft, and the oscillating dog produces no change in the position of the belt.

A represents the frame of a loom, which is

made of iron or any other suitable material, and forms the bearings for the several working parts and the general mechanism for weaving. The yarn or warp threads are taken from a series of spools put up in a suitable frame on the rear end of the loom, and they (the warp-threads) pass through between two rollers, *a a'*, thence over the oscillating frame *b*, through the harness and reed, and over the breast-beam *c* to the cloth rollers *d d'*, and after passing these rollers the woven fabric is deposited on the ground or in some suitable receptacle. The rollers *a a'*, and also the rollers *d d'*, are arranged in such relation toward each other that they can be compressed, and the threads or fabric is firmly clamped between them.

The axles or gudgeons of the rollers *a a'* have their bearings in boxes *e*, secured to the rear end of the frame *A*, and the axles or gudgeons of the rollers *d d'* have their bearings in similar boxes, *f*, at or near the front end of the said frame, and the axles or gudgeons of the lower rollers, *a* and *d*, extend beyond their respective boxes far enough to make room for worm-wheels *i* and *j*, which gear in worms or endless screws *g h*, mounted on a shaft, *k*, to which a rotary motion is imparted by suitable gear from the driving-shaft of the loom. By the action of the worms and worm-wheels the rollers *a* and *d* are rotated precisely with the same speed, and the warp-threads, when once properly stretched, retain their tension, and no back motion is possible.

In order to produce the shed without subjecting the warp-threads to an additional strain, or, in other words, to give yarn to the thread, a shedding-motion is applied, which consists of a frame, *b*, to which an oscillating motion is imparted by a cam, *b'*, mounted on the crank-shaft and acting on a lever, *b<sup>2</sup>*, which connects with said frame.

At the time the shed is to be made, the frame *b* swings forward and the tension of the warp-threads is decreased, and after the shuttle has passed through the shed, and while the batten beats up the weft, the frame *b* swings back and the warp-threads are restored to their original tension.

The correct action of the shedding-motion actually depends upon the proper tension of the warp-threads, and upon the action of the



rollers  $a a' d d'$ . If the threads and the fabric are firmly clamped between these rollers they will retain their tension and still allow the shedding-motion to produce the desired effect.

The selvage is produced by giving to one or two threads at each side of the loom an up-and-down motion independent of the harness. This object is effected by the action of a shaft,  $l$ , which extends across the loom near the bottom part of the frame A. Mounted on this shaft are two drums,  $l'$ , one of which is provided with two straps,  $l^2 l^3$ , which wind thereon in opposite directions, whereas one strap winds on the other drum in the same direction as the strap  $l^2$ . The belts  $l^2$  connect with the heddle cords  $l^4$ , and the belt  $l^3$  connects with a crank,  $l^5$ , on a small shaft,  $l^6$ , which has its bearings in suitable brackets or standards secured to the frame A, and to which a rotary motion is imparted by suitable gear from the driving-shaft. The heddle-cords  $l^4$  extend over pulleys  $l^7$ , in the upper part of the frame A, and their loose ends are secured to weights  $l^8$ , which serve to keep them tight and to raise one heddle after it has been depressed, or depress the same after it has been raised by the action of the crank  $l^5$  on the strap  $l^3$ .

As the crank revolves in the direction of the arrow marked thereon in Fig. 2 of the drawings, the strain exerted on the belt  $l^3$  causes the shaft  $l$  to revolve in the direction of the arrow marked near it in the same figure, and the belts  $l^2$  wind up on the drums  $l'$ , causing one heddle to ascend and the other to descend, said heddles being secured to their cords on opposite sides of the pulleys  $l^7$ . As the motion of the crank  $l^5$  continues, and after the same has passed its upper center, the belt  $l^3$  becomes slack, the weights  $l^8$  cause the belts  $l^2$  to unwind, and the belt  $l^3$  winds up on the drums  $l'$ , and the motion of the heddles is reversed.

The stop-motion consists of a small shaft,  $m$ , which extends across the loom in front of the batten. This shaft has its bearings in two swivel-boxes,  $m'$ , which are secured in the ends of the screw-rods  $m^2 m^{2*}$ . One of these rods is fastened in the upper end of a spring-standard,  $m^{3*}$ , which is rigidly attached to the frame A, but the other screw-rod,  $m^2$ , extends from the loose end of a lever,  $m^3$ , which is secured to the bracket  $n$  by means of a pivot,  $m^4$ , so that it can oscillate back and forth in a horizontal plane. Said oscillating lever is arranged on the upper surface of a bracket,  $n$ , which is provided with a slot,  $n'$ , to form the guide for the belt-shipper  $n^2$ . This belt-shipper consists of a spring-lever, the spring of which has a tendency to throw the upper end of the same toward the frame and to cause the driving-belt of the loom to pass from the

fast to the loose pulley. In order to throw the belt back on the fast pulley the belt-shipper has to be forced out in the guide-slot, and when the same is made to catch in the notch  $n^3$ , near the outer end of said guide-slot, it retains the belt on the fast pulley until it is thrown out of said notch and allowed to fly back toward the frame A. This object is effected by the action of the oscillating lever  $m^3$ , and in order to force this lever back automatically and throw the belt-shipper out of the notch  $n^3$  whenever the weft-thread breaks or gives out, two or more hooked arms,  $m^5$ , are secured in the shaft  $m$ , extending toward the batten in a direction at right angles to the same and with their hooked ends in such a position that they come in contact with the weft-thread whenever the batten moves forward. By the action of the weft-thread on the hooked ends of the arms  $m^5$  the shaft  $m$  is turned slightly, and the hooked tail  $m^6$ , which extends therefrom in a direction opposite the arms  $m^5$ , is raised clear of a dog,  $o$ , which is pivoted to the frame A, and to which an oscillating-motion is imparted by the action of a cam mounted on the shaft  $l^6$  and of an arm,  $o'$ , connected to said dog, as shown in Fig. 2 of the drawings. The dog  $o$  is provided with a shoulder, and if the arms  $m^5$  do not come in contact with the weft-thread—that is to say, if the weft-thread has given out or is broken—the tail  $m^6$  is caught by the shoulder of the dog, and as said dog moves in the direction of the arrow marked on it in Fig. 2 of the drawings, the lever  $m^3$  is forced out against the belt-shipper, throwing the same out of the notch  $n^3$  and allowing it to follow the tendency of its spring and to cause the belt to change from the fast to the loose pulley.

By having a hooked arm at or near either end of the shaft  $m$ , the stop-motion operates instantaneously on whatever side of the loom the weft-thread may break or give out, and no unnecessary throw of the shuttle will take place before the loom stops.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the shaft  $k$ , worms  $g h$ , wheels  $i j$ , rollers  $a a' d d'$ , rocking-frame  $b$ , arm  $b^2$ , and cam  $b'$ , when constructed and arranged to operate as herein specified.

2. The belts  $l^2 l^3$  and drums  $l'$ , in combination with the crank  $l^5$  and the heddle-cords  $l^4$ , constructed and operating substantially as and for the purpose set forth.

3. The devices above described for effecting the stop-motion, arranged substantially as and for the purpose specified.

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WM. T. MCNAMARA.