No. 789,762. PATENTED MAY 16, 1905.

G. SCHWABE.

LAY MOTION FOR LOOMS.

APPLICATION FILED DEC. 7, 1903.

*Fig. 1.*

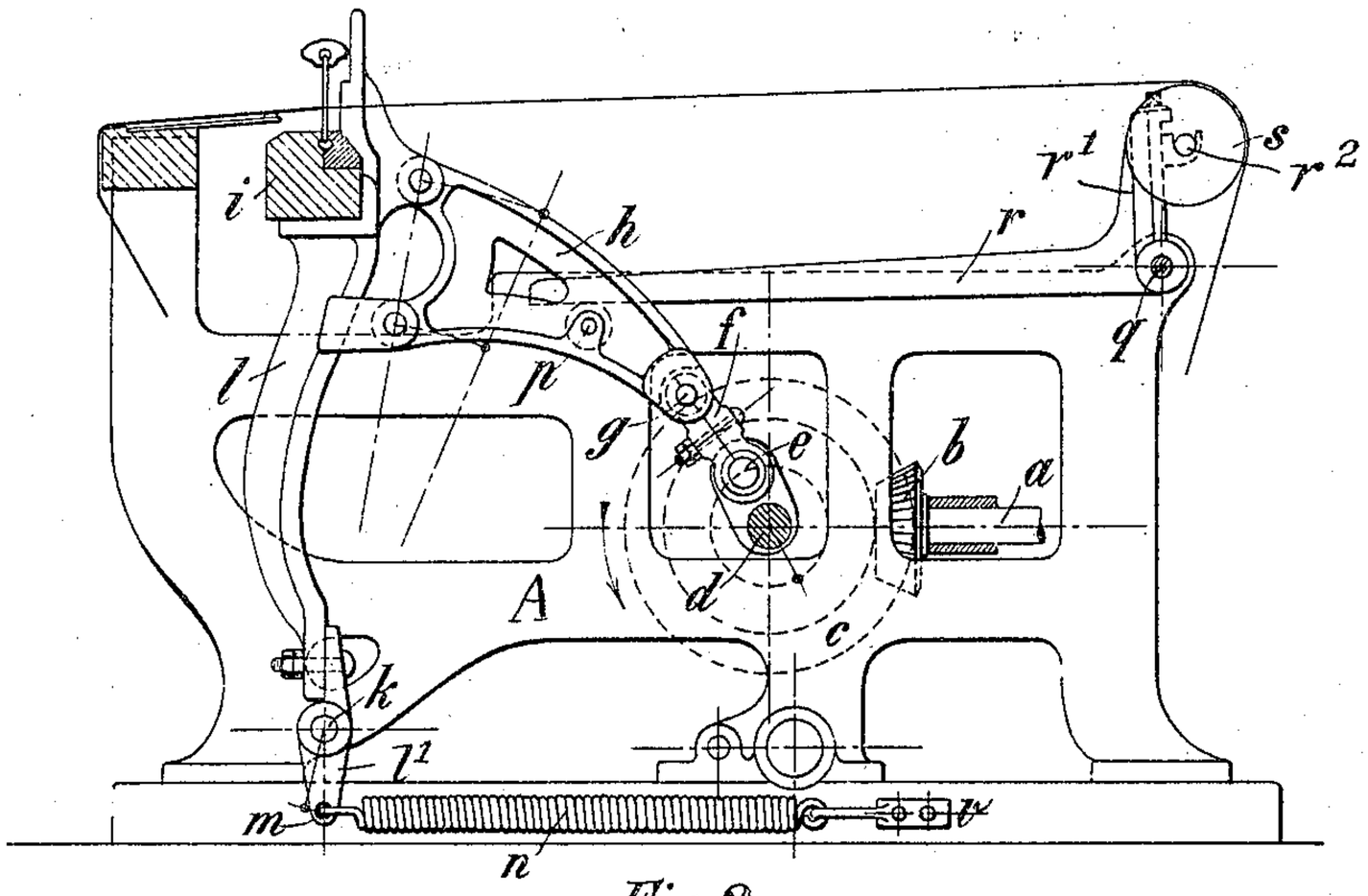
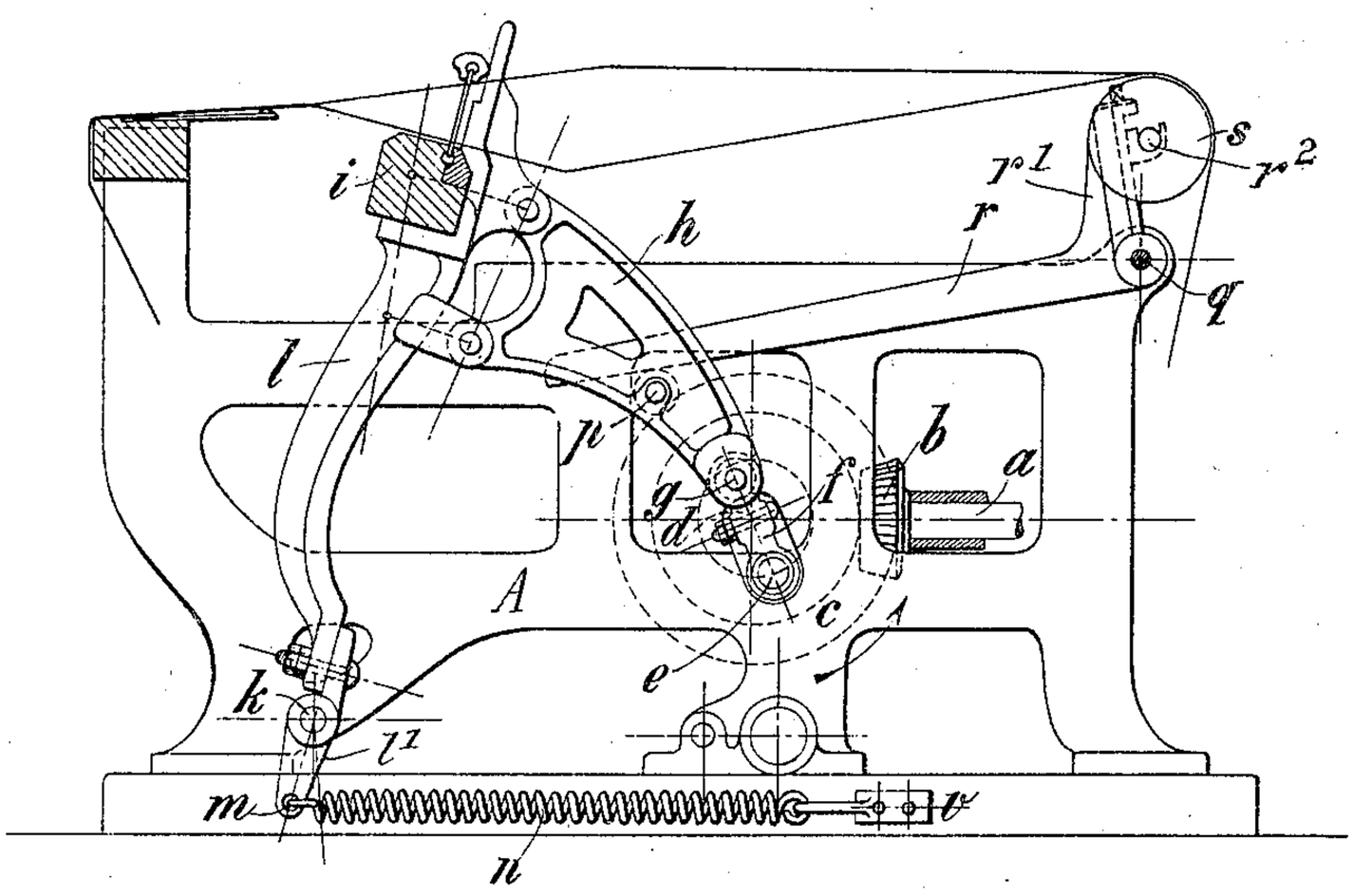



*Fig. 2.*

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# UNITED STATES PATENT OFFICE.

GEORG SCHWABE, OF BIELITZ, NEAR BIALA, AUSTRIA-HUNGARY.

## LAY-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 789,762, dated May 16, 1905.

Application filed December 7, 1903. Serial No. 184,222.

*To all whom it may concern:*

Be it known that I, GEORG SCHWABE, a subject of the Emperor of Austria-Hungary, residing at Bielitz, near Biala, Austrian Silesia, Austrian Empire, have invented an Improved Lay-Motion for Looms, of which the following is a specification.

This invention relates to a loom which is provided with a spring-influenced lay of such a construction that a steady and uniform operation of the loom is insured.

In the accompanying drawings, Figure 1 is a sectional elevation of part of a loom embodying my invention, and Fig. 2 a similar view showing the parts in a different position.

With the construction of mechanical looms as heretofore practiced the lay when working on heavy fabrics is of very considerable weight. In order to avoid the necessity of overcoming the weight of the lay in the forcing back of the picking-thread against the fell by the action of the reed, the lay is situated as far back as possible, so that in this position its center of gravity will coincide with the center of rotation. Upon the rearward motion of the lay, as shown by the arrow in Fig. 1, however the weight of the lay comes into action the more the distance of its center of gravity from the center of rotation increases. The rotation of the crank-shaft being continued, the pressure upon the same and the crank-pin and upon the connecting-pins of the links increases. In the case of increasing the number of revolutions the movement of the lay is also acting and increases the pressure, this pressure of the lay being transmitted to the driving-pulley, as shown by the arrow in Fig. 1, and the driving-belt of the loom is therefore exerting a checking action instead of a pulling action on the rearward movement of the lay. The belt commences to pull when the lay has arrived at the lowest position of its path. This change of the direction of power acting upon the driving-belt causes lack of uniformity in the working of the loom. When the lay-operating crank is moving in the direction of the arrow, Fig. 2—that is to say, when the lay is approaching the fell, so as to beat up the picking-thread—the power which acts on the driving-belt is expended first in moving the lay into the beating-up position, and, furthermore, for the purpose of overcoming the weight which is usually employed for keeping the warp-threads taut. This weight, which is not represented in the drawings, is attached to a lever $r$, one arm of which rests upon the rollers $p$, which are fastened to the brackets for connecting the lay-swords with the crank-pin, while the other arm of the lever $r$ acts upon the take-up beam $s$, and thereby keeps the warp taut. This causes a considerable strain and wear upon the crank-pins, and after a longer or shorter time the motion of the lay is so unsteady and becomes so little uniform that the flying out of the shuttle from its path cannot be avoided.

The present invention is intended to overcome all these inconveniences. It does away so completely with the pressure of the lay during the forward and backward movement and with the pressure exerted upon the crank-shaft, upon the pins of the links, and the crank-pin that the latter is not subjected to wear any more.

The invention is based upon the utilization of the weight of the lay, as well as upon its action as a whole during the backward movement of the lay, as shown by the arrow in Fig. 1, which causes the spiral springs to become distended, which latter are brought into action during the forward movement, as shown by the arrow in Fig. 2.

The driving-shaft $a$, Figs. 1 and 2, of the loom transmits its rotation by means of the wheels $b$ and $c$ upon the crank-shaft $d$, by means of which the lay $i$ is oscillated back and forth by the medium of the crank-pin $e$ and the links $f$ with the pins or studs $g$ and the brackets $h$ of the lay. The lay rests upon swords $l$, which are pivoted to the frame A at $k$ and are provided with integral arms or extensions $l'$ in alinement with swords $l$ and projecting beyond the pivots. Each of these arms is perforated at $m$ for engagement with one end of a counterbalancing-spring $n$, the other end of which is secured to a fastening $o$ at some point of the lay-frame below the operating-crank and lay. The brackets $h$ carry rollers $p$, which support arms $r$ of angle-levers $r\,r'$, fulcrumed at $q$. The other arms, $r'$,

of these levers support the take-up beam *s* at $r^2$.

When the lay *i* is moving in the backward direction, as shown by the arrow in Fig. 1, tension is imparted to the spiral springs which act upon the lay-swords *l* at the point *m*. The tension augments upon the continuation of the backward movement of the lay, thereby compensating entirely the ensuing action of the weight of the lay, and it eliminates the pressure of the lay upon the crank-shaft *d* and upon the pins *g* and *e* of the links and the crank. The tension of the spiral springs *n* is so adjusted that during the backward movement of the lay in the direction of the arrow in Fig. 1 the driving-belt of the loom is no longer exercising any checking action, as the direction of the force on the belt remains the same continuously. After the lay has reached the lowest point of its path it commences its forward movement in the direction of the arrow in Fig. 2. The charged spiral springs *n* are now working in the reverse order. They eliminate the pull on the lever *r* of the take-up beam produced by the taut warp-threads and also the weight of the forwardly-moving lay, as shown by the arrow in Fig. 2, the compensating power of the spiral springs *n* being greatest at that point where the weight of the lay *i* is chiefly operated—that is to say, in the deepest position—while the compensating power of the springs is least—that is to say, equal to zero—when the lay has reached its beating-up position again, as shown in Fig. 1. Thus even in the forward movement of the lay *i* any pressure upon the crank-shaft *d*, upon the pins or studs *g* of the links, and upon the crank-pin *e* is overcome, and there is no further need of the crank-shaft *d* exerting any power upon the lay *i* during the backward and forward movement of the same; but the shaft only acts as a guiding means.

What I claim, and desire to secure by Letters Patent of the United States, is—

In looms, the combination with the lay, lay-supporting oscillating brackets or swords, a crank-pin and pivotal connection between said pin and the lay and lay-swords, of an extension integral with and in line with said swords and extending beyond the fulcrum of the same, a spring at the free end at any of said extensions and extending substantially at right angles to the lay, said spring being fastened at some point of the lay-frame below the operating-crank of the lay.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GEORG SCHWABE.

Witnesses:

ANTON BUDZIKIEWICZ,

CARL SCHMIDT.