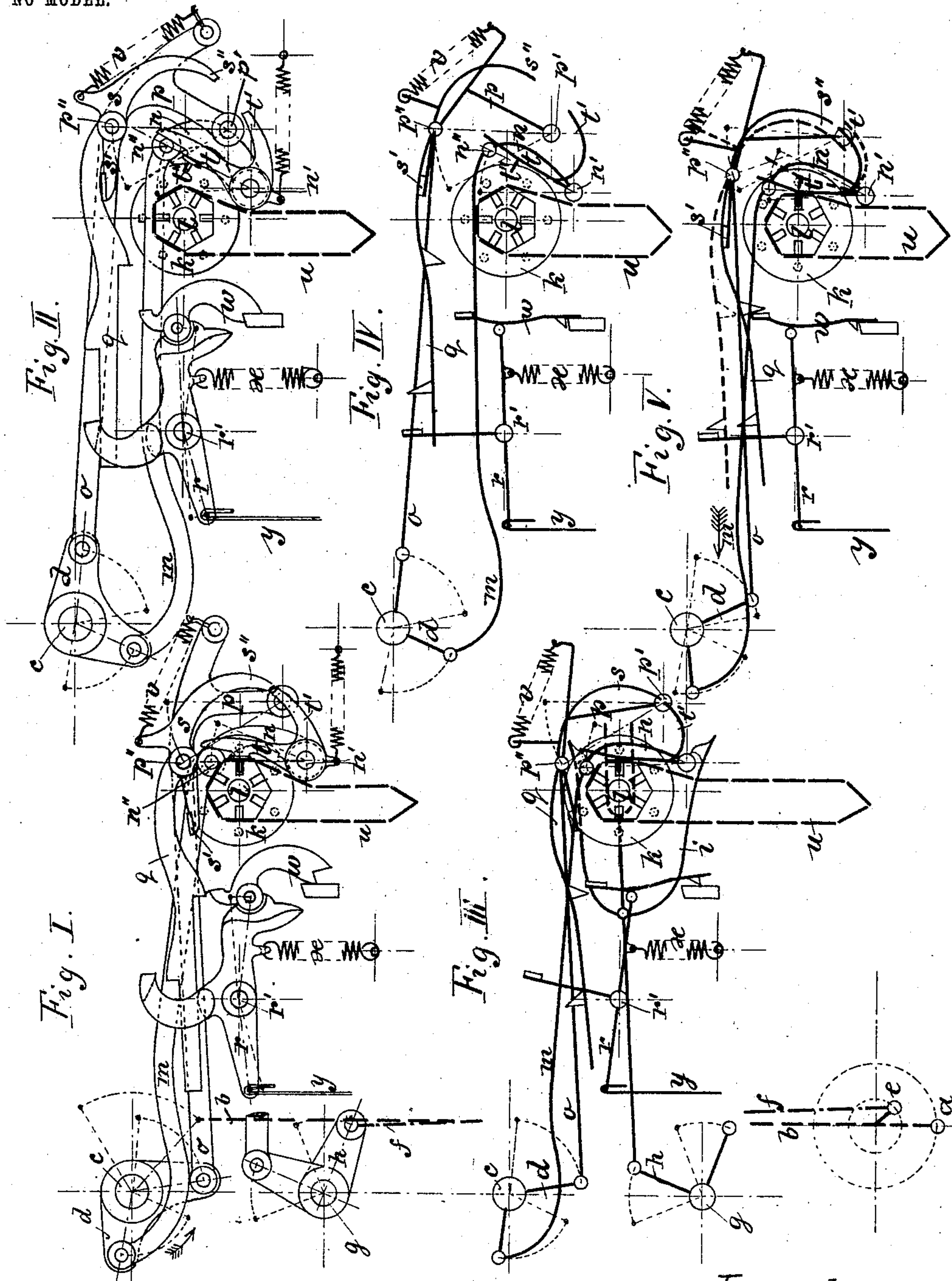


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MECHANISM FOR CHANGING THE SHUTTLES IN LOOMS.

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NO MODEL.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

GEORG SCHWABE, OF BIELITZ, AUSTRIA-HUNGARY.

## MECHANISM FOR CHANGING THE SHUTTLES IN LOOMS.

SPECIFICATION forming part of Letters Patent No. 765,711, dated July 26, 1904.

Application filed February 17, 1903. Serial No. 143,801. (No model.)

*To all whom it may concern:*

Be it known that I, GEORG SCHWABE, manufacturer, a subject of the Emperor of Austria-Hungary, residing at Bielitz, Silesia, Austria-Hungary, have invented certain new and useful Improved Mechanism for Changing the Shuttles in Looms, of which the following is a specification.

This invention relates to looms in which the changing of the shuttles has heretofore been effected by chain and roller jacquard apparatus; and it has for its object to enable paper pattern-cards to be employed for that purpose, while the roller-jacquard is retained for producing the pattern. As the axis of the drum of the iron roller-jacquard is carried in fixed bearings and for the sake of simplicity the drum for the shuttle-changing cards is according to my invention mounted on the same shaft as the above it cannot receive the oscillating motion which the drums of ordinary jacquard apparatus receives. Means must therefore be provided whereby the drum of the paper-jacquard can be freely turned, so as to bring those parts into action that effect the changing of the shuttles by bringing the required shuttle-box in line with the shuttle-race of the lay. This is effected as I will describe with reference to the accompanying diagrammatic drawings.

Figures 1 and 3 show the mechanism in that position at which the changing of the shuttle-boxes is to commence. Figs. 2 and 4 show the mechanism in the position during the turning of the drum, and Fig. 5 shows the position of the parts after the completion of such turning.

The iron roller or bar raises or lowers the thrust-bars *q*, which in their forward motion effect, by means of their upper or lower beaks, the lowering of the pawl-levers *r* and the wires *y* for changing the shuttles or the disengagement of the pawls *w* of the pawl-levers *r* and the raising of the wires *y* for changing the shuttles. By means of a crank *a*, fixed on a loom-shaft, the shaft *c* is moved to and fro by means of the rod *b*. Also the crank *e* moves, by means of the pull *f*, the shaft *g* with crank *h*, Figs. 1 and 3, which

by means of the turning hooks *i* turn the lantern-wheel *k* of the card-drum *l*.

On the shaft *c* is fixed a two-armed lever or bell-crank *d*, which, on the one hand, is connected by the rod *m* with the guide-arm *n*, pivoted at *n'* and provided with a pin *n''*, and, on the other hand, it is connected by rod *o* with the guide-arm *p*, pivoted at *p'* and carrying a pin *p''*. The latter carries the thrust-bars *q*, together with the abutment-levers *s*.

The bars *q* are guided by the pawl-levers *t*, while the levers *s* engage at *s'* beneath the thrust-bars *q* and are pressed by the guide-arm *p* through the action of springs *v* against the bars *q*.

The beak at *s''* is adapted to strike against the end *t'* of the forked needle-lever *t*, which is provided with a pin *t''* and is pivoted at *n'*. The needles or pins *t''* fit accurately into the corresponding openings of the paper pattern sheet or card *u*.

The needle-levers *t'* are pressed, by means of weak springs, against the drum, and they are extended above the needles *t''*, the pin *n''* of the guide-arm *n*, being made to bear against such extension.

After the change of the shuttle-boxes the crank *a* actuates the lever *d* by means of the rod *b*, and consequently also the pull-rods *m* and *o*, in the direction of the arrow, Fig. 1, as also the guide-arms *n* and *p*, with their pins *n''* and *p''*. As the position of the two-armed lever *d* is now such that the pull-rod *o* is acted upon by the full length of the lever-arm, while the pull-rod *m* is acted upon by a very much shortened lever-arm, the pin *p''*, together with the thrust-bars *q* and the abutment-levers *s*, will move more rapidly forward in the direction of the arrow than the pin *n''* of the guide-arm *n*. The beak *s''* of the abutment-lever *s* is therefore raised away from the feeler-lever *t* before the pin *n''* will come in contact with extension of the needle-lever *t*. As soon as the latter takes place the pins *t''* are removed by the lever *t* so far from the paper card *u*, Figs. 2 and 4, that the turning of the card-drum can commence freely, this being effected by the crank *e* through the pull *f*, lever *h*, and the turning hooks *i*.



Already during the turning the abutment-levers  $s$ , as also the needle-levers  $t$ , guided by the pin  $n''$ , approach the card-drum in the direction of the arrow, Fig. 5. After the completion of the turning the needles  $t''$  of the levers  $t$  either engage with the openings of the paper card  $u$  or bear against the surface thereof, so that according to the one or other case the ends  $t'$  of the levers  $t$  are either in the raised or in the lowered position. The now approaching beaks  $s''$  of the levers  $s$  can in the latter case pass beyond the needle-levers  $t$ ; but in the former case they bear against the same, and as the pin  $p''$  moves farther on the thrust-bars  $q$  and abutment-levers  $s$  move away from each other. Hereupon the thrust-bars  $q$  can fall freely and their lower beaks pass at the correct moment in front of the pawls  $w$ , which are thus disengaged and descend with the pawl-levers  $v'$ , so as to allow the wire-pulls  $y$ , that are attached to the other side of the fulcrum of  $v$ , to be drawn upward.

Those abutment-levers  $s$  which at  $s''$  have passed free beyond the ends  $t'$  of the feeler-levers  $t$ , as at Fig. 5, which takes place when the pin  $t''$  bears upon the surface of the paper card, are caused by the spring  $v$  to raise the thrust-bars  $q$  at  $s$ . Their upper beaks pass in front of the upper part of the pawl-levers  $v$ , causing the pawls  $w$  to be again engaged, while the wire-pulls  $y$  are lowered for effecting the shuttle change, so that now the change

of the shuttle-boxes can be effected. After the completion of such changing the rotation of the crank  $a$  again commences, as described with reference to Figs. 1 and 2.

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

1. In a loom, an abutment-lever, a thrust-bar pivoted thereto, a feeler-lever having a pin and adapted to engage the abutment-lever, a perforated card adapted to engage the feeler-lever pin, combined with a pawl-lever having a beak, and a pawl adapted to be engaged by the thrust-bar, substantially as specified.

2. In a loom, the combination of a bell-crank with a pair of rods pivoted thereto, a thrust-bar and an abutment-lever pivoted to one of said rods, a feeler-lever having a pin and adapted to engage the abutment-lever, a perforated card adapted to engage the feeler-lever pin, a pin on the second rod, adapted to engage the feeler-lever, and a pawl-lever having a beak and a pawl adapted to be engaged by the thrust-bar, substantially as specified.

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

GEORG SCHWABE.

Witnesses:

ANTON BUDZIKIEWICZ,  
CARL SCHMIDT.