G. SCHWABE.

SHUTTLE OPERATING DEVICE.

APPLICATION FILED APR. 23, 1908.

928,802.

Patented July 20, 1909.

2 SHEETS—SHEET 1.

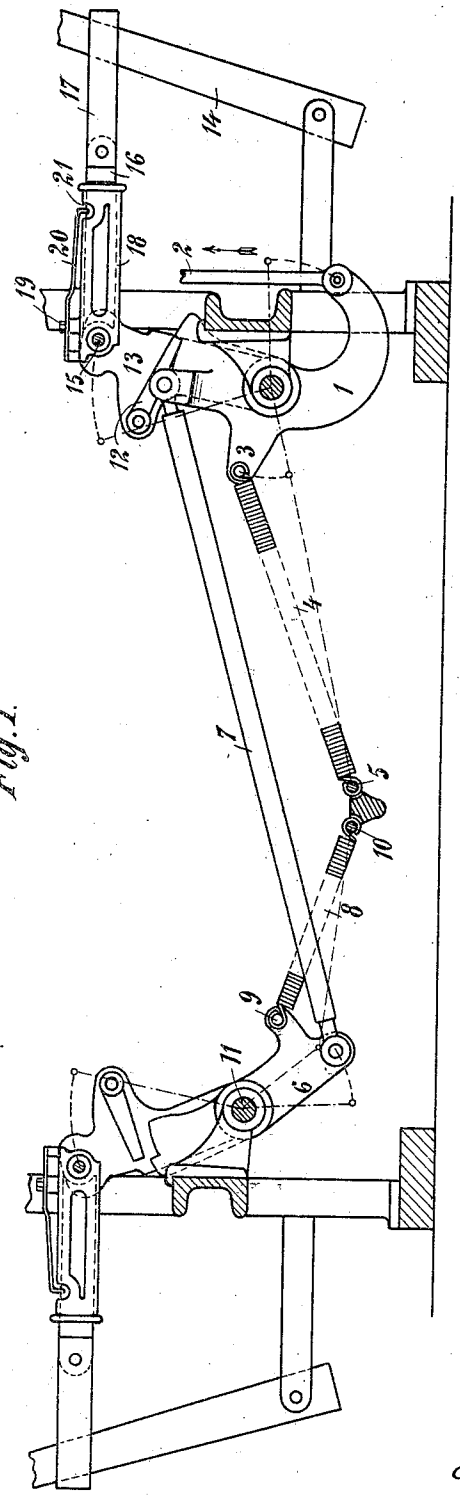


Fig. 1.

Witnesses:
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M. R. Schulz.

Inventor:
Georg Schwabe
by his attorney
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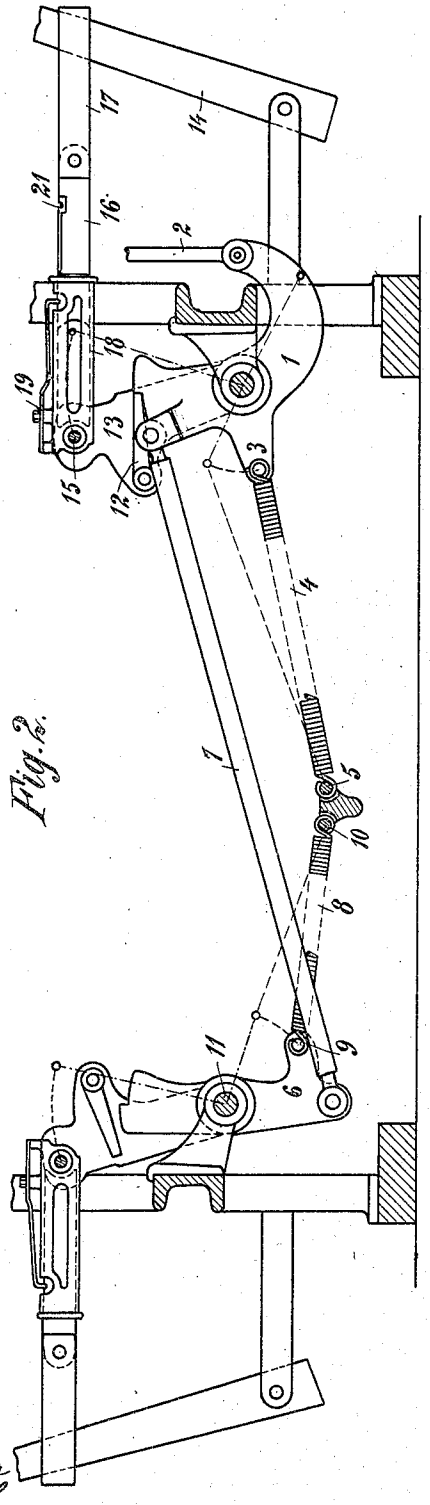


Fig. 2.

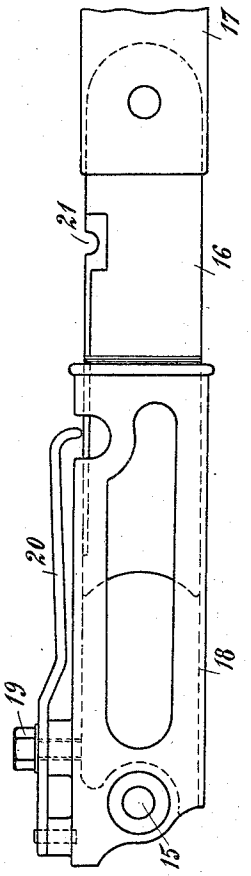


Fig. 3.

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UNITED STATES PATENT OFFICE.

GEORG SCHWABE, OF BIELITZ, AUSTRIA-HUNGARY.

SHUTTLE-OPERATING DEVICE.

No. 928,802. Specification of Letters Patent. Patented July 20, 1909.

Application filed April 23, 1908. Serial No. 428,786.

To all whom it may concern:

Be it known that I, GEORG SCHWABE, a subject of the Emperor of Austria-Hungary, and a resident of Bielitz, Austrian Silesia, part of the Austro-Hungarian Empire, have invented new and useful Improvements in Shuttle-Operating Devices, of which the following is a specification.

This invention comprises a combination of the directly acting driving device with spring acting drive, inasmuch as on the one hand the spring action is utilized in the beginning of the driving operation, in order to reduce the power required, while on the other hand it produces a braking action upon the driving parts before the termination of the driving operation, in such a manner that the action of the mass of the parts, that is to say their inertia, is partly obviated.

This device is shown in Figures 1 to 3, Fig. 1 showing the position before the beginning of the throwing of the shuttle; Fig. 2 illustrates the position when the throwing of the shuttle has been completed, while Fig. 3 is an enlarged side view of the coupling.

The sector 1, (Fig. 1, position before starting the throwing of the shuttle), which is connected by the rod 2 to the picker mechanism, is connected in its upper part at 3, with a spiral spring 4, acting as a lever arm and which is secured at 5, to the loom itself. On the sector 6, on the opposite side of the loom, which is connected by the rod 7, to the sector 1, similar connection is made with a spiral spring 8, which is however not secured to the upper part of the sector 6, but at a point 9, which is in line with the fastening point 10 and the pivoting point 11 of the sector 6, so that the leverage of the sector 6 is reduced to *nil*, this position being termed the dead point or dead center. The pawl 12 connects the sector 1, or the lever 6, respectively, to the picker arm 13, which acts upon the picker stick 14 by means of the wooden pull rod 16 with safety device and leather loop 17.

The safety device against the breaking of the picker mechanism for power looms, relates particularly to such safety mechanisms as will prevent the breaking of the parts by interrupting the connection between the picker lever and the picker stick. By means of the particular arrangement of parts of the pull rod and connections, the parts are disconnected in case of an obstruction, while, after the finishing of the stroke, the connection is restored.

As soon as, by means of the operating mechanism, the pull rod 2 is drawn upward in the direction of the arrow, (Fig. 1), the sectors 1 and 6, (Fig. 2), have a corresponding movement and the picker arm 13 is also moved by means of the pawl 12, the said arm being connected to the picker stick 14 which operates the shuttle. This allows the extended spiral spring 4 to contract, resulting in a reduction of the amount of power required for the throwing of the shuttle. At the same time, however, tension is being put on the spiral spring 8, which is removed from its inoperative position, (Fig. 1), by the movement of the sector 6, the said spring opposing a strong resistance in the position according to Fig. 2, to the forward movement, which resistance is still increased by the fact that the spiral spring 4, on the other hand, has been moved into a position in which it does not operate the sector 1, after the picker movement has been effected, (Fig. 2).

Inasmuch as the spiral spring 8 does not begin to exercise its power before the picker movement has attained its highest speed which takes place at about half the stroke of the picker mechanism, the operation of the spiral spring 4 is not in any way interfered with thereby. The spiral spring 8 being extended after the completion of the stroke, partially overcomes the inertia of all the different parts of the picker mechanism, so that the picker movement takes place without jerking.

After the completion of the throwing of the shuttle, the operating mechanism moves the pull rod 2 back in the opposite direction, and also the sectors 1 and 6, the picker arm 13 and the picker stick 14. During this time, the sector 1 puts tension on the spiral spring 4, while the sector 6 allows contraction of the spiral spring 8. The sectors 1 and 6 will then remain in this position, (Fig. 1), until the shuttle is thrown again.

The above mentioned detachable connection between the picker lever 13 and the picker stick 14 is effected by securing the sliding part 16 to which the leather loop 17, connected to the picker stick 14, is fastened, detachably in a guiding sleeve or shoe 18 which is pivoted by means of a stud 15 to the picker lever 13. The sleeve 18 is provided at 19 with a flat spring 20, engaging with a cor-

responding groove 21 on the sliding part 16, thus effecting the connection between the sliding part 16 and the sleeve 18. The shuttle driving mechanism transfers its movement by means of this connection in the ordinary manner from the picker lever to the picker stick 14. When, however, an obstruction is placed in the path of the picker stick 14, the flat spring becomes disengaged from the groove 21, the picker arm 13 with the sleeve 18 continues its movement, and the sliding part 16 which has become released by the disengagement of the flat spring 20 is projected from the sleeve 18 until the picker lever 13 has assumed its extreme position, see Figs. 2 and 3, and by this means breaking of the shuttle driving mechanism is prevented. The picker lever 13, which is now returned to its initial position, pushes the guiding sleeve 18, which is mounted thereon, upon the sliding part 16 which is able to operate upon the picker stick 14, until the flat spring 20 enters again into the groove 21.

I claim:

A shuttle operating device comprising a first pivoted sector, a second pivoted sector, a connecting rod, a support intermediate the sectors, a first spring hung to the first sector and support, a second spring hung to the second sector and support, the first spring diverging from a line connecting the support with the pivot of the first sector at the beginning of the stroke, while the second spring simultaneously coincides with a line connecting the support with the pivot of the second sector.

Signed by me at Vienna, Austria, this tenth day of April 1908.

GEORG SCHWABE.

Witnesses:

FRIEDR. RUNGE,

THEODOR SCHWARZ.