No. 753,521. PATENTED MAR. 1, 1904.

C. SCHOEN.

SWIVEL LOOM.

APPLICATION FILED FEB. 12, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

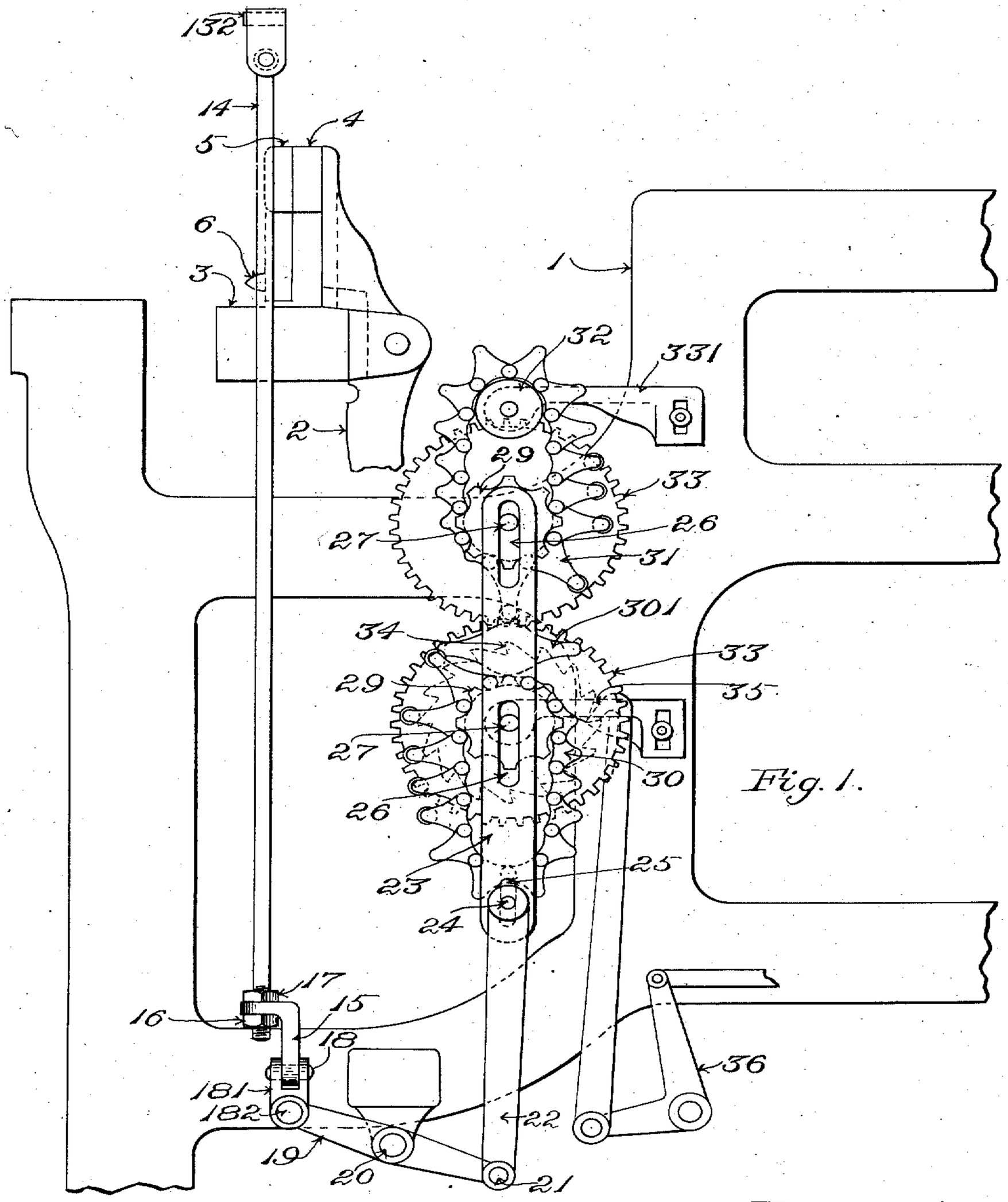

Fig. 1.

Witnesses:
Oscar F. Hill
Aline Tarr.

Inventor:
Carl Schoen
By Macleod Calver & Randall
Attorneys.

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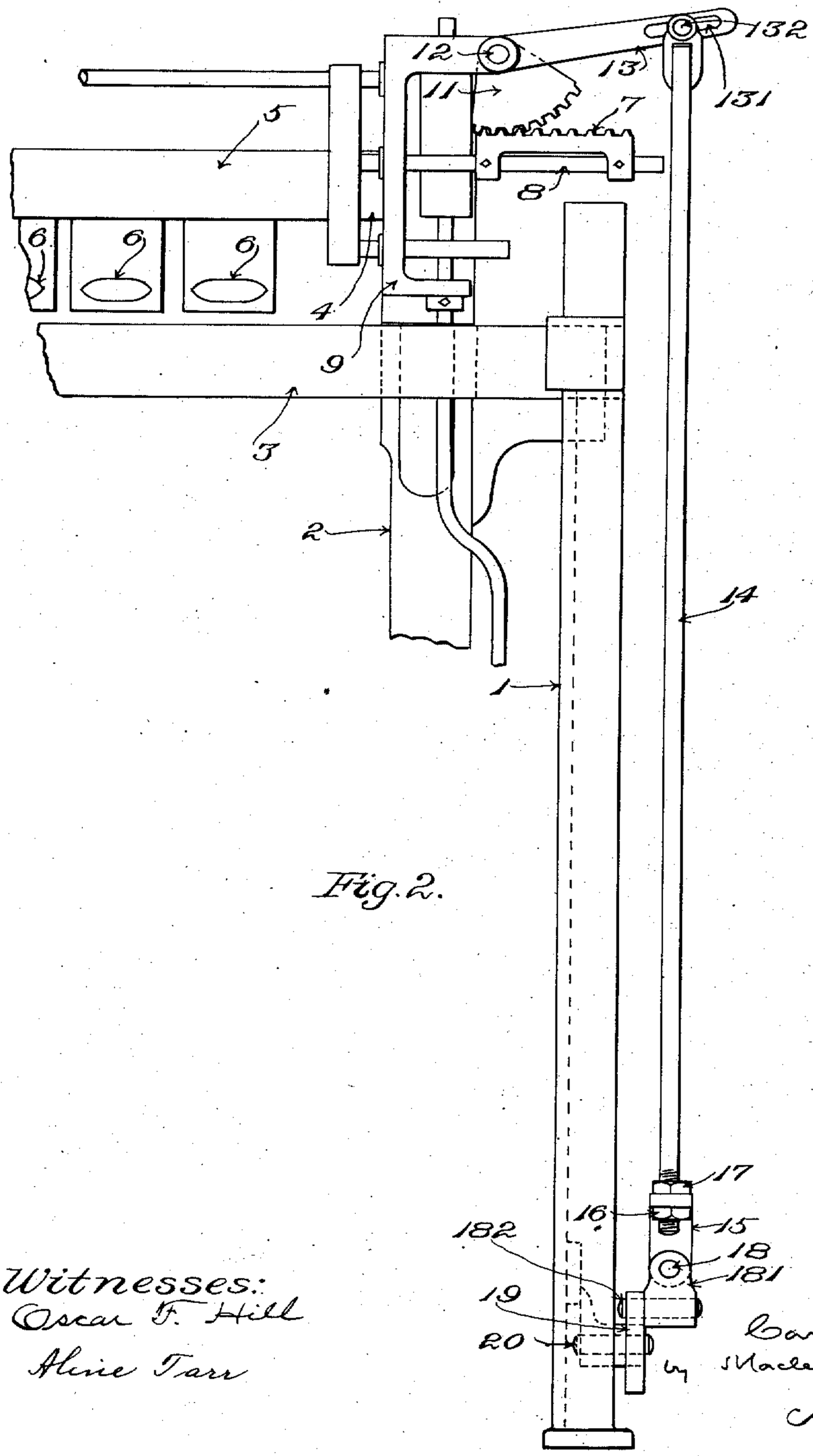

Fig. 2.

Witnesses:
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No. 753,521. Patented March 1, 1904.

UNITED STATES PATENT OFFICE.

CARL SCHOEN, OF NEW YORK, N. Y.

SWIVEL-LOOM.

SPECIFICATION forming part of Letters Patent No. 753,521, dated March 1, 1904.

Application filed February 12, 1903. Serial No. 143,032. (No model.)

To all whom it may concern:

Be it known that I, CARL SCHOEN, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented a certain new and useful Improvement in Swivel-Looms, of which the following is a specification, reference being had therein to the accompanying drawings.

Swivel-looms are provided with mechanical arrangements by means of which at predetermined intervals in the course of the weaving the swivel-batten of a loom of this class automatically is moved in the direction of its length transversely of the loom in order to shift relative to the warp-threads in the direction of the width of the web being produced the position of the swivel-shuttles which are carried by the said swivel-batten. In some cases this transverse shift is made to take place after the completion of a line of spots or figures across the web in order that the spots or figures of the line next succeeding in the direction of the length of the web may be caused to alternate in position transversely with relation to those of the first line in well-known manner. In other instances the shift of the swivel-batten is caused to occur at more or less frequent intervals during the production of the design or figure and for greater or less distances in order to produce the required effects in the swivel figure or pattern by the resulting changes in the positions of the successive picks of swivel-weft which are introduced into the web by the respective swivel-shuttles.

The invention relates to the mechanism by which the swivel-battens of swivel-looms are shifted laterally in the said looms; and one general object of the invention is to provide mechanism of improved character adapted to produce any shifts of the swivel-battens which are made necessary by the results needed to be attained in the weaving.

The object of the invention is, further, to provide mechanism which will enable any required number, either odd or even, great or small, of different positions of the swivel-batten and the swivel-shuttles carried thereby to be produced in one repeat of the pattern being made in the web with the aid of the swivel-shuttles; also, to provide mechanism which will enable movement of the swivel-batten and swivel-shuttles to be occasioned from any given position within the operative range of positions to any other position within said range, including movement of the swivel-batten and swivel-shuttles from one extreme position to the other, with only one ground-pick between successive positions of the swivel-batten, if desired, thereby giving the greatest capacity and efficiency and also enabling the swivel-batten to be shifted when required by one movement of the same to the extent of the spacing of the swivel-shuttles, so that different colors or kinds of swivel-weft may be alternated in the goods in the length of the warp, either as successive portions of a continuous pattern or figure, with, if desired, only one pick of ground-weft between, or in the production of successive figures or spots.

An embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 shows in side elevation portion of a loom having the said embodiment applied thereto, only such parts of the loom being shown as are required in order to render clear the relations, &c., of the parts in which the invention resides. Fig. 2 is a view looking from the front of the loom, the breast-beam and adjacent parts being omitted.

Having reference to the drawings, portion of a loom-frame is indicated at 1, such being one side or end of the said loom-frame. At 2 is shown portion of a lay-sword; at 3, portion of the lay-beam; at 4, portion of the reed-cap on the lay, and at 5 portion of a swivel-batten mounted adjacent the reed-cap, as customary. Swivel-shuttles carried by the swivel-batten are indicated at 6 6. The manner and means of supporting the swivel-batten, moving it vertically for the purpose of placing it in and out of operative position with relation to the warps, operating the swivel-shuttles, &c., all may be as heretofore and will be obvious to those who are skilled in the art.

I will now proceed to describe the parts by which the longitudinal shifts of the swivel-batten transversely of the loom are occasioned. The intermediate motion-transmit-

ting connections and the manner and means of making connection with the swivel-batten itself are not of the gist of the invention. They may be varied in practice and as deemed advisable or found necessary. The drawings show a rack 7, mounted upon a slide-rod 8, projecting from the end of the swivel-batten through a guide on the vertically-movable support 9 for the swivel-batten, the said rack being engaged by a sector 11, pivoted at 12 upon the said support 9, the said sector having fast therewith an arm 13. The free extremity of said arm is slotted longitudinally at 131 to receive the adjustable bolt or pivot 132, by which is joined with said arm the upper end of a rod 14, which latter at its lower end passes through an eye in a horizontal projection of the coupling-piece 15, the said lower end being screw-threaded and receiving thereon the adjusting-nuts 16 and 17, located, respectively, below and above said horizontal projection. Coupling-piece 15 is joined pivotally at 18 with the block 181, mounted upon the pin or stud 182, carried by the forward arm of a rocker 19, pivoted at 20 and having its rear arm joined pivotally at 21 to the lower end of a link 22, the upper end of which is connected with a slider 23 by pivot-pin 24, adjustably secured in vertical slot 25 in said slider. The pivotal connection at 18 between the coupling-piece 15 and block 181 permits the transverse swinging movements of the rod 14 resulting from the curvilinear path of the bolt or pivot 132, connecting the upper end of the rod with the arm 13, as said arm is caused to swing vertically. The slider 23 extends vertically, although this is not material to the invention, and is formed with vertical slots 26 26, through which the studs 27 27 extend. The said studs are mounted one above the other and parallel with each other on the loom side. Upon said studs 27 27 are mounted the barrels or wheels 29 29. Upon the slider 23 between the upper and lower barrels or wheels 29 29 is mounted the projection 301, which latter from the manner of its cooperation with the tappets of the two tappet-chains which pass around the said barrels or wheels I term a "follower."

In carrying the invention into effect the barrels or wheels 29 29 are formed as chain-barrels, and with the said chain-barrels, respectively, are combined the tappet-chains 30 31, respectively. The loose portion or slack of the lower tappet-chain 30 hangs below the lower chain-barrel. The upper tappet-chain passes over an idler 32 above the upper chain-barrel, mounted upon a vertically-adjustable support 331, and thereby the slack of the upper tappet-chain is taken up or supported. The respective tappet-chains are composed of links that are pivotally joined to one another. The exterior portions of said links are shaped to act against the follower 301 and by their engagement therewith move the slider 23, so as to transmit to the swivel-batten the movement which will occasion the required shift thereof. The links are made of graduated heights corresponding with the various positions which the swivel-batten is required to assume, and they are separably and interchangeably pivoted to one another, so that they may be put together in any required order or sequence, and each tappet-chain may thus be built up to suit the pattern that it is desired to produce in the weaving. The links having the higher elevations to act against the surfaces of the follower are preferably equipped with anti-friction-rollers to make contact with the follower for the purpose of reducing the friction, wear, and strain which are incident to the working. A link of one tappet-chain and a link of the other tappet-chain act in unison upon the follower which intervenes between said links as they simultaneously are brought around into position to act against the follower. Thus by the conjoint action of the pair of links against the top and botton of the follower simultaneously the follower is moved into the required position and held there, thereby securing the required shift and positioning of the swivel-batten through the connections which have been described.

An essential characteristic of the invention is the fact that the chain-barrels or their equivalents, by which the tappet-chains are presented to the follower, are relatively small in diameter, the said diameter, the working faces of the follower, and the lengths of the links from one pivot to another being so proportioned that when one link of either chain is in full engagement with the follower, holding the latter in the required position, the projecting portions of the links next adjoining in front of said link and behind the same extend at opposite angles from the chain-barrel on radial lines passing entirely outside and clear of the portion of the follower with which engagement of the link occurs. This prevents two adjoining links on one tappet-chain from making contact with the follower at one time, whatever may be the relative heights of said links. Hence a link of the lowest height may succeed or itself be followed by a link of the greatest height in use without any interference on the part of the link of the greatest height with the follower. This enables the swivel-batten to be shifted by one advance of the tappet-chains clear from one extreme position to the other. This would be practically impossible with the use of pattern cylinders or barrels having pins or pegs driven into the peripheries thereof. Owing to the necessity for forming such pattern cylinders or barrels of moderately small diameter on account of the limited space which is required to be occupied thereby, the necessary close proximity of the pins to one another on a pattern cylinder or barrel would cause the extremely long pins to interfere with the

position of the follower if they immediately preceded or followed a blank space or extremely short pin. Pattern cylinders or barrels sufficiently large in diameter to permit the pins or pegs to be spaced widely apart enough to obviate interference, as just indicated, would be altogether too large in their proportions. With the use of pattern cylinders or barrels having pins or pegs driven into the peripheries thereof changes of the swivel-batten from one extreme position thereof to the other can be made only by successive steps or movements, with picks of ground-weft between, rendering impossible the attainment of results which are attained by my invention.

The chain barrels or wheels are connected to turn in unison by means of gear-wheels 33 33, and one of them is provided with a ratchet-wheel 34, that is engaged by a pawl 35, the latter being connected with a bell-crank or rocker 36, having in practice suitable connections with a head motion or the like, whereby the said pawl is operated at the predetermined intervals in the working of the loom to impart movement to the chain barrels or wheels and advance the tappet-chains.

The tappet-chains have the advantage that they can be built up of any required length, either great or small, to suit the pattern and to contain any required number of repeats of the pattern. It is immaterial what particular number of links may be required for one repeat of the pattern, inasmuch as any convenient multiple of such number may be included in the chains, which is not the case with pattern-cylinders having pins or pegs applied to them. With these latter a given pattern cannot be produced unless the number of holes in the pattern-cylinder corresponds with or is an exact multiple of the number of pins or pegs in one repeat.

What is claimed is—

In a swivel-loom, in combination, the swivel-batten and its swivel-shuttles, a follower and motion-transmitting connections intermediate the same and the swivel-batten, to shift the latter transversely in the loom, tappet-chains composed of links having projections of various heights, and chain-barrels of relatively smaller diameter having said follower located between them, whereby the projecting portions of links on each chain at opposite sides of the link of said chain in action against said follower are caused to extend at opposite angles on radial lines clear of the follower, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CARL SCHOEN.

Witnesses:
WILLIAM J. HARE,
FRANK J. MULLEN.

Correction in Letters Patent No. 753,521.

It is hereby certified that in Letters Patent No. 753,521, granted March 1, 1904, upon the application of Carl Schoen, of New York, N. Y., for an improvement in "Swivel-Looms," an error appears in the printed specification requiring correction, as follows: In line 50, page 3, the word "smaller" should read *small;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22d day of March, A. D., 1904.

[SEAL.]

F. I. ALLEN,
Commissioner of Patents.

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