

No. 742,817.

PATENTED OCT. 27, 1903.

F. A. & H. A. GUILLETTE.  
BOX PATTERN MECHANISM FOR LOOMS.

APPLICATION FILED APR. 23, 1900.

NO MODEL.

2 SHEETS—SHEET 1.

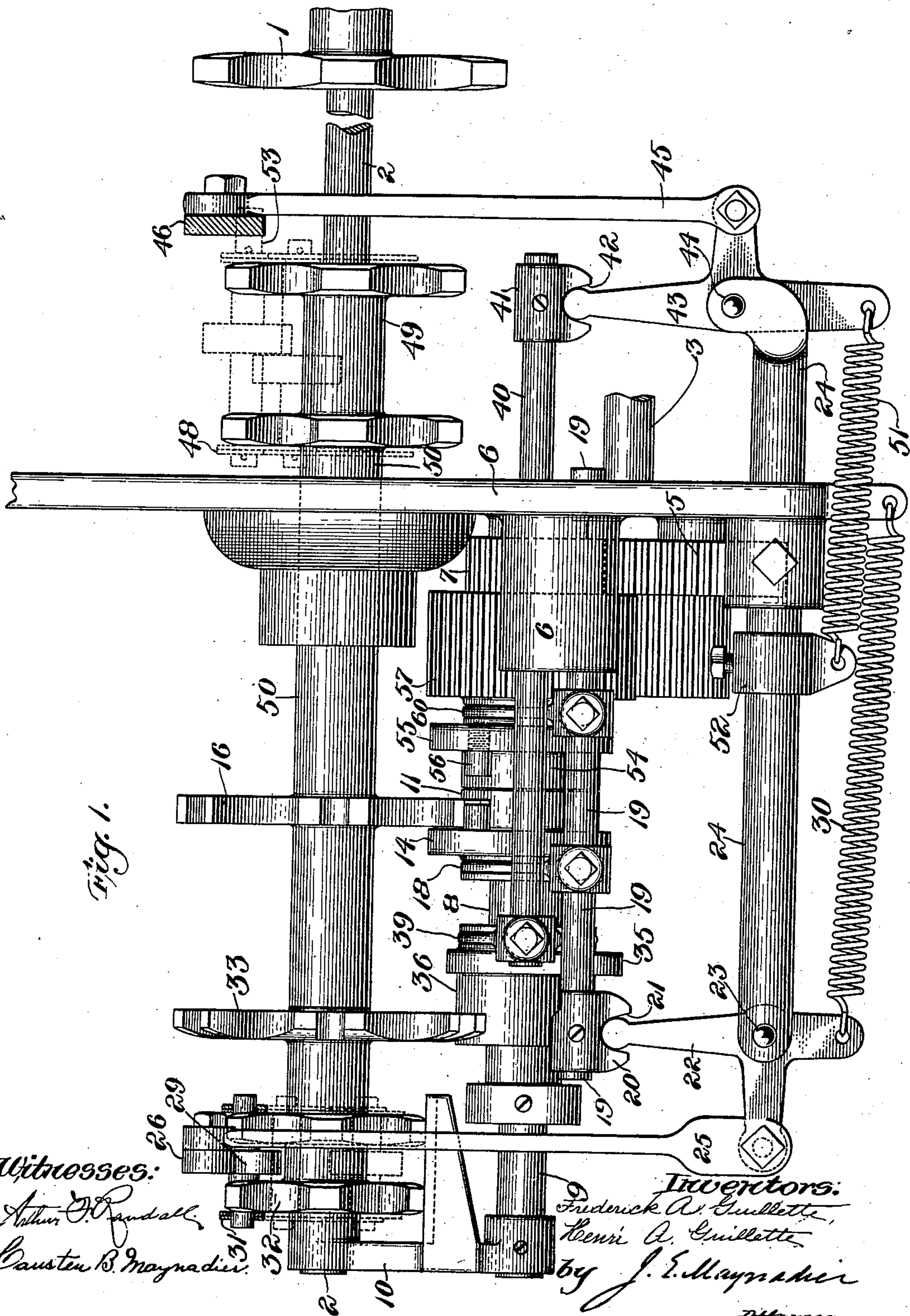


Fig. 1.

Witnesses:

Arthur D. Randall,  
Causten B. Maynard.

Inventors:

Frederick A. Guillette,  
Henri A. Guillette.

by J. E. Maynard  
Attorney.

No. 742,817.

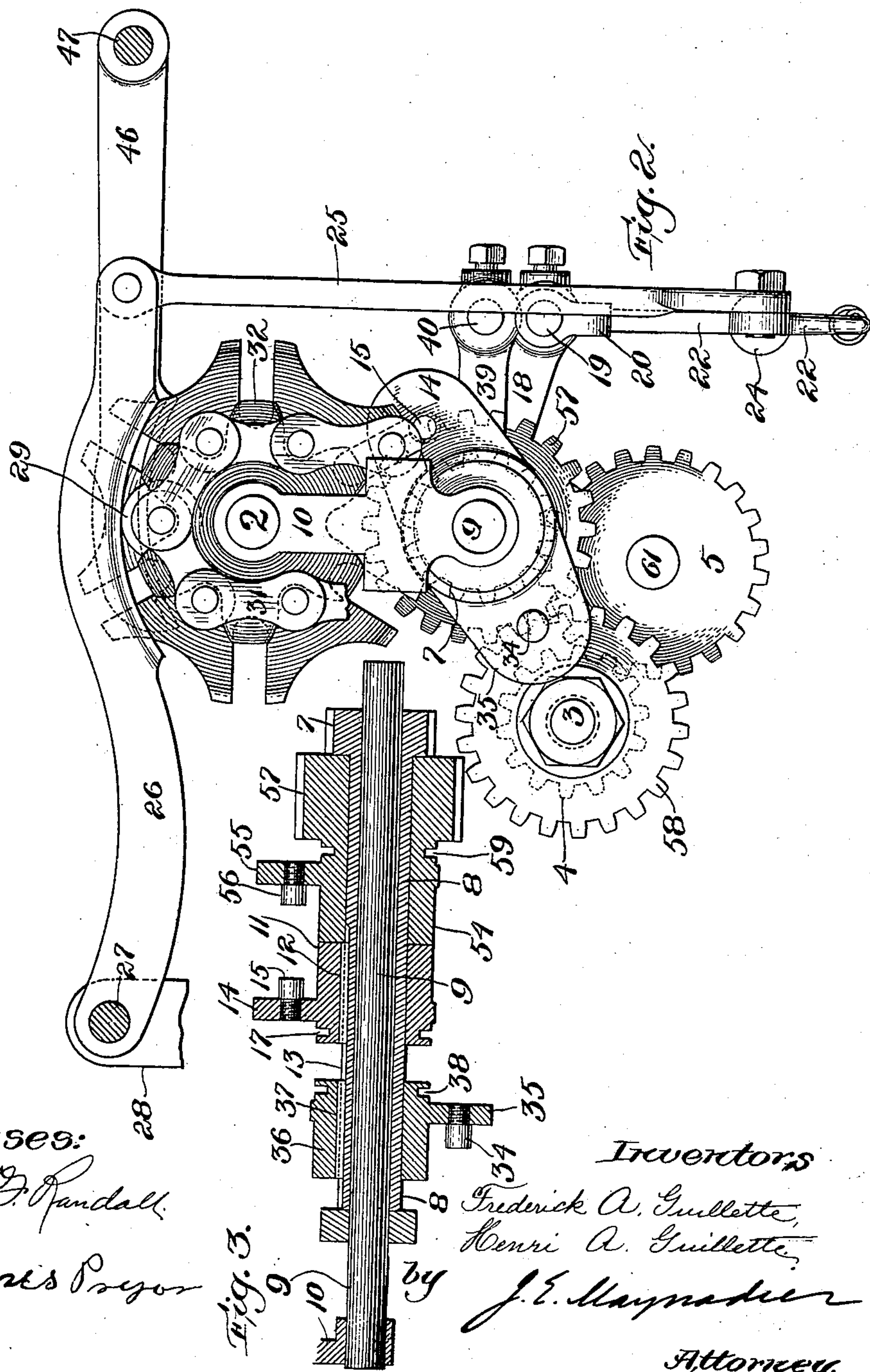
PATENTED OCT. 27, 1903.

F. A. & H. A. GUILLETTE.  
BOX PATTERN MECHANISM FOR LOOMS.

APPLICATION FILED APR. 23, 1900.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:

Arthur G. Randall.

James P. Poyor

Inventors

Frederick A. Guillette,

Henri A. Guillette,

by J. E. Maynard

Attorney.



# UNITED STATES PATENT OFFICE.

FREDERICK A. GUILLETTE AND HENRI A. GUILLETTE, OF TAUNTON, MASSACHUSETTS, ASSIGNORS TO CROMPTON & KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## BOX-PATTERN MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 742,817, dated October 27, 1903.

Application filed April 23, 1900. Serial No. 13,847. (No model.)

*To all whom it may concern:*

Be it known that we, FREDERICK A. GUILLETTE and HENRI A. GUILLETTE, of Taunton, in the county of Bristol and State of Massachusetts, have invented an Improved Box-Pattern Mechanism for Looms, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of our improved box-pattern mechanism for looms. Fig. 2 is an end view of the mechanism shown in Fig. 1 as viewed from the left in said figure. Fig. 3 is a sectional detail drawn on a reduced scale and hereinafter referred to.

Our invention relates to box-pattern mechanisms for looms of that class shown and described in United States patent to G. F. Hutchins, No. 413,369, dated October 22, 1889.

In the patent referred to the main-pattern indicator-chain which acts upon the levers of the box-shifting mechanism is actuated by mechanism which is controlled by an auxiliary set of indicators, and the auxiliary set of indicators act upon that mechanism and cause the latter to either hold a single bar of the main-pattern indicator-chain in operative position for a number of successive picks of the loom or else to move the chain forward step by step uninterruptedly, so as to move the bars of the chain successively into operative position. It will therefore be clear that when the design being woven called for a change of shuttle-box for every pick of the loom, as in pick-and-pick weaving or as in repeated alternations of more than two threads, it was necessary to run the box-chain continuously forward step by step to move the indicators on that chain successively into operative position and to provide as many bars and links in the box-chain as picks in the pattern to be produced, and as a result it has often been the case that an exceedingly long and clumsy chain was necessary to produce a given pattern made up in most part of pick-and-pick weaving or of repeated alternations of more than two threads.

Our invention has for its object to improve the construction of box-pattern mechanisms for looms, to the end that fewer indicators will

be required to produce a given pattern made up in most part of pick-and-pick weaving or of repeated alternations of more than two threads and to thereby greatly reduce the length of the box-pattern indicator-chain, and our improved box-pattern mechanism comprises a main box-pattern indicator-chain for operating the box-shifting mechanism, means for actuating said chain in one direction, means for actuating said chain in the opposite direction, and automatic means for controlling both of said actuating means which causes the latter to alternately act upon the chain.

Referring to the drawings, 1 designates the usual harness pattern-barrel, which is fast to shaft 2, and barrel 1 carries the usual harness pattern-chain (not shown) for operating the harnesses of the loom. Shaft 2 is connected in the usual manner with a shaft 3, to which power is applied, and on shaft 3 is fast a gear 4, which meshes with an intermediate gear 5, loose on a stud 61, fast to the frame 6 of the loom. Intermediate gear 5 meshes with a gear 7, formed on the end of a sleeve 8, which is loose on a rod 9, fast at one end to frame 6 and at its other end to a link 10, depending from the end of shaft 2.

On sleeve 8 is a hub 11, which is connected to sleeve 8 by a key 12, which slides in keyway 13 in said sleeve, so that hub 11 is free to be moved lengthwise of sleeve 8, but must turn with it. Hub 11 has an arm 14 projecting from it, on which is a pin 15, which engages a star-wheel 16, loose on shaft 2, and said hub is also formed with an annular groove 17, which is occupied by a yoke 18, fast to the endwise-movable rod 19, which is mounted in frame 6. Rod 19 has fast to it a block 20, formed with a socket 21, which is engaged by one arm of a lever 22, pivoted at 23 to a bracket 24, fast to frame 6. The other arm of lever 22 is pivotally connected to the lower end of a link 25, which is pivotally connected at its upper end to the free end of a lever 26, pivoted at 27 to a bracket 28, projecting from frame 6.

Lever 26 is moved in one direction by the auxiliary box-pattern indicators 29 and in the opposite direction by a spring 30, one end of



which is fast to lever 22 and the other end to frame 6. The auxiliary-pattern indicators 29 are mounted on the bars of the auxiliary-pattern chain 31, carried by barrel 32 on shaft 2, and barrel 32 is connected with a star-wheel 33, which is engaged by a pin 34 on arm 35, projecting from hub 36, which is mounted on sleeve 8, and hub 36 is connected to sleeve 8 by a key 37, which projects into keyway 13 in said sleeve, so that hub 36 is, like hub 11, free to move lengthwise of sleeve 8, but turns with it.

Hub 36 is formed with an annular groove 38, which is occupied by a yoke 39, and yoke 39 is fast to an endwise-movable rod 40, mounted in frame 6, and rod 40 has fast to it a block 41, in which is a socket 42, engaged by one arm of a lever 43, pivoted at 44 to bracket 24. The other arm of lever 43 is pivotally connected to the lower end of a link 45, which is pivotally connected at its upper end to a lever 46, fulcrumed upon a bar 47, which is also the fulcrum of the levers (not shown) for operating the box-shifting mechanism. Lever 46 is acted upon by the ends of certain of the bars of the main box-pattern indicator-chain 48, carried by the barrel 49, which is connected with star-wheel 16 by sleeve 50.

Lever 46 is moved in one direction by the projecting ends 53 of the long bars in chain 48 and in the opposite direction by a spring 51, fast at one end to lever 43 and at its other end to an adjustable collar 52, fast on bracket 24.

So long as lever 46 is held in its uppermost position by the elongated bars of chain 48 star-wheel 33 is engaged and moved step by step by arm 35 and chain 31 is moved forward in one direction step by step, and so long as lever 46 is held in its lowermost position arm 35 is held in its inoperative position, as shown in Fig. 1, and chain 31 is held stationary.

On sleeve 8 is loosely mounted a hub 54, from which projects an arm 55, which carries a pin 56, and hub 54 is integral with a gear 57, which engages a gear 58, fast on shaft 3, so that when shaft 3 is turning gear 57 and arm 55 turn in one direction and gear 7 and arm 14 turn in the opposite direction.

Hub 54 is formed with an annular groove 59, which is occupied by a yoke 60, fast on rod 19, and when rod 19 is moved endwise the two hubs 11 and 54 move together with it, and the movement of rod 19 from one of its two positions to its other position throws one arm 14 or 55 into operative position and the other arm out of operative position.

It will now be clear that so long as lever 26 is held in its uppermost position by auxiliary indicators 29 arm 14 will occupy its operative position with relation to star-wheel 16 and chain 48 will be moved forward in one direction step by step and arm 55 will occupy its inoperative position, and that so long as there are no auxiliary indicators 29 under lever 26 and the latter occupies its lowermost posi-

tion arm 55 will occupy its operative position and chain 48 will be moved backward step by step and arm 14 will occupy its inoperative position. It will also be clear that if the auxiliary indicators 29 be so arranged in chain 31 as to alternately raise and lower lever 26 for each pick of the loom arms 14 and 55 will be alternately moved into operative position and chain 48 will be reciprocated, so that one of two of the bars of chain 48 will be alternately placed in operative position and those two bars of the chain will suffice for any number of successive picks of the loom when weaving pick-and-pick.

When the pattern being woven calls for the repeated alternation of more than two threads—as, for example, three different threads—the indicators 29 are so arranged in chain 31 as to hold arms 14 and 55 alternately in operative position each for two successive picks of the loom, so that chain 48 will be moved forward two steps in succession and backward two steps in succession. In this manner each of three of the bars of chain 48 will be moved into operative position; but the middle bar of the three will be moved into operative position at each alternate pick of the loom, and this condition is required particularly when two-faced goods are being woven, one side of which is to be plain and the other or face side of which is to be of regular alternations of two different threads.

With our improved mechanism the chain is reciprocated when the loom is weaving pick-and-pick, so as to bring the bars of a single pair or group of bars of the chain alternately into operative position, and therefore the number of bars and links required in the chain is greatly reduced and the length of chain required is greatly lessened.

What we claim as our invention is—

1. In a pattern mechanism for looms provided with a star-wheel and pin-wheel actuating means, a horizontal pin-wheel shaft, a longitudinally-movable pin-wheel thereon rotatable in one direction, and a second longitudinally-movable pin-wheel thereon, rotatable in the opposite direction, and a free space between the pins on the pin-wheels, a main-pattern cylinder-shaft parallel with said pin-wheel shaft, a star-wheel fast thereon, operated by one pin-wheel when in operative position, to rotate said main-pattern shaft in one direction, and operated by the other pin-wheel when in operative position, to rotate said main-pattern shaft in the opposite direction, and said main-pattern cylinder-shaft stationary when neither of the two pins is in operative position and the star-wheel is in the free space between the two pins, substantially as shown and described.

2. In a pattern mechanism for looms provided with a star-wheel and pin-wheel actuating means, a horizontal pin-wheel shaft, a longitudinally-movable pin-wheel thereon rotatable in one direction, and a second longitudinally-movable pin-wheel thereon rota-



table in the opposite direction, a main-pattern cylinder-shaft parallel with said pin-wheel shaft, a star-wheel fast thereon, operated by one pin-wheel when in operative position, to rotate said main-pattern shaft in one direction, and operated by the other pin-wheel when in operative position, to rotate said main-pattern shaft in the opposite direction, substantially as shown and described.

3. In the pattern mechanism of a loom, a main-pattern surface, and means to move said pattern-surface either forward or backward, an auxiliary-pattern surface, means under the control of the main-pattern surface, in either its forward or backward movement, to move said auxiliary surface, or leave it at rest, and means under the control of said auxiliary surface, to move said main surface either forward or backward, substantially as shown and described.

4. In the pattern mechanism of a loom, having a star-wheel and pin-wheel actuating mechanism, the combination with the star-wheel of the main-pattern surface cylinder, of two hubs rotating in opposite directions, and each carrying an engaging pin, and means under the control of an auxiliary-pattern surface to move said hubs longitudinally, to disengage one and engage the other of the two pins with the said star-wheel, whereby the pattern-surface may be moved forward or backward, as one or the other of the pins may be in engagement with the said star-wheel, substantially as shown and described.

5. In the pattern mechanism of a loom, having a star-wheel and pin-wheel actuating mechanism for the main and auxiliary pattern indicating mechanism, a pin-wheel shaft carrying a pin-wheel hub movable longitudinally, to move the main-pattern-chain star-wheel in one direction, and a second hub movable longitudinally, to move said star-wheel in the opposite direction, and an endwise-movable rod carrying a yoke engaged with one of said hubs, and a second yoke engaged with said second hub, and intermediate connections between said endwise-movable rod and said auxiliary-pattern mechanism, to place either of said hubs in operative position to move said main-pattern star-wheel in either

direction, substantially as shown and described.

6. In a loom having a star-wheel and pin-wheel actuating mechanism, a main and auxiliary pattern indicating mechanism, a pin-wheel shaft for carrying a pin-wheel hub movable longitudinally, to move the main-pattern-chain star-wheel in one direction, and a second hub movable longitudinally, to move said star-wheel in the opposite direction, an endwise-movable rod carrying a yoke engaged with one of said hubs, and a second yoke engaged with said second hub, and intermediate connections between said endwise-movable rod and said auxiliary-pattern mechanism to place either of said hubs in operative position to move said main-pattern star-wheel in either direction, and a third hub on said pin-wheel shaft, movable longitudinally, to move the multiplier-pattern star-wheel, a second endwise-movable rod carrying a third yoke engaged with the third hub, and intermediate connections between said endwise-movable rod and said main-pattern mechanism, to place said third hub into or out of operative position with said multiplier star-wheel, to move or leave it at rest, substantially as shown and described.

7. In a loom, the combination of a main-box pattern-indicator chain for operating the box-shifting mechanism, means for actuating said main chain in one direction, separate means for actuating said main chain in the opposite direction, automatic mechanism for controlling both of said actuating means for effecting an automatic reverse of the main chain, an auxiliary-pattern indicator-chain, and an operative connection between the main-box chain and the auxiliary chain, said operative connection being controllable from an element of the main chain and comprising means for being thrown in and out of operative relation to the auxiliary chain for putting the motion of the latter in and out of play.

FREDERICK A. GUILLETTE.  
HENRI A. GUILLETTE.

Witnesses:

WM. MAYNADIN,  
ARTHUR F. RANDALL.