

(No Model.)

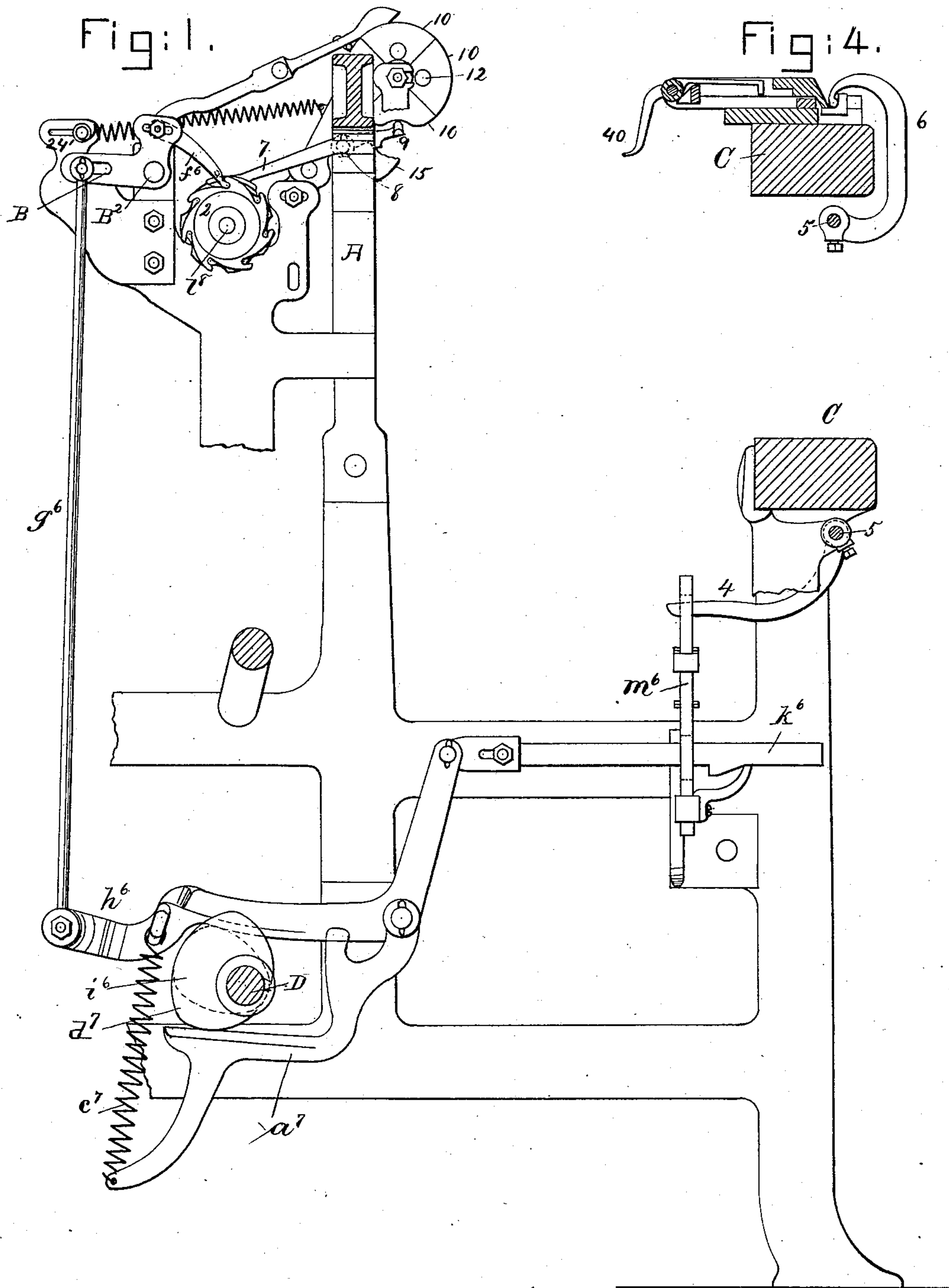
2 Sheets—Sheet 1.

H. WYMAN.

PATTERN DEVICE FOR SHUTTLE BOX OPERATING MECHANISM FOR LOOMS.

No. 364,696.

Patented June 14, 1887.



Witnesses—

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John F. C. Freinick

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(No Model.)

2 Sheets—Sheet 2.

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Fig:3.

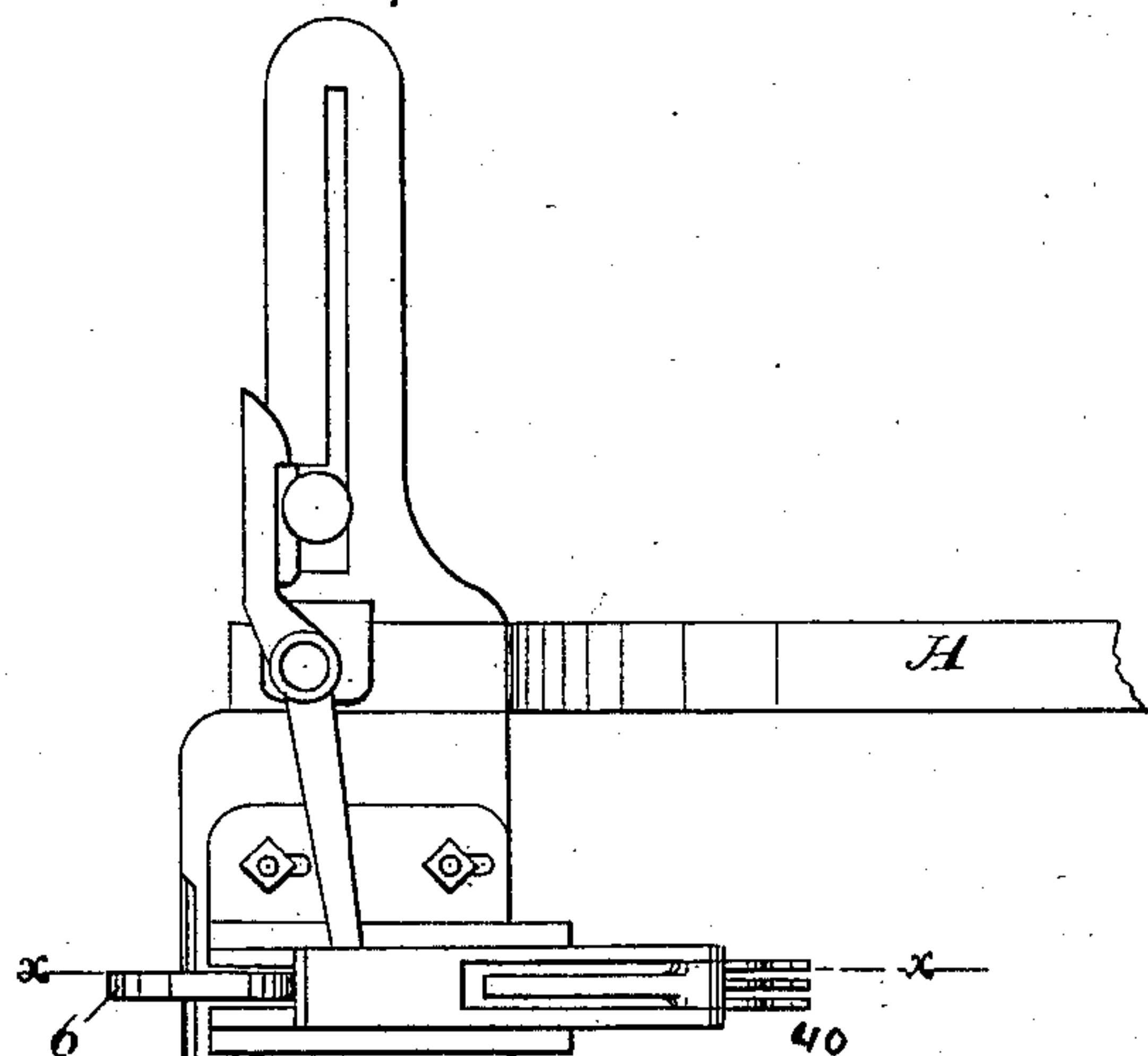
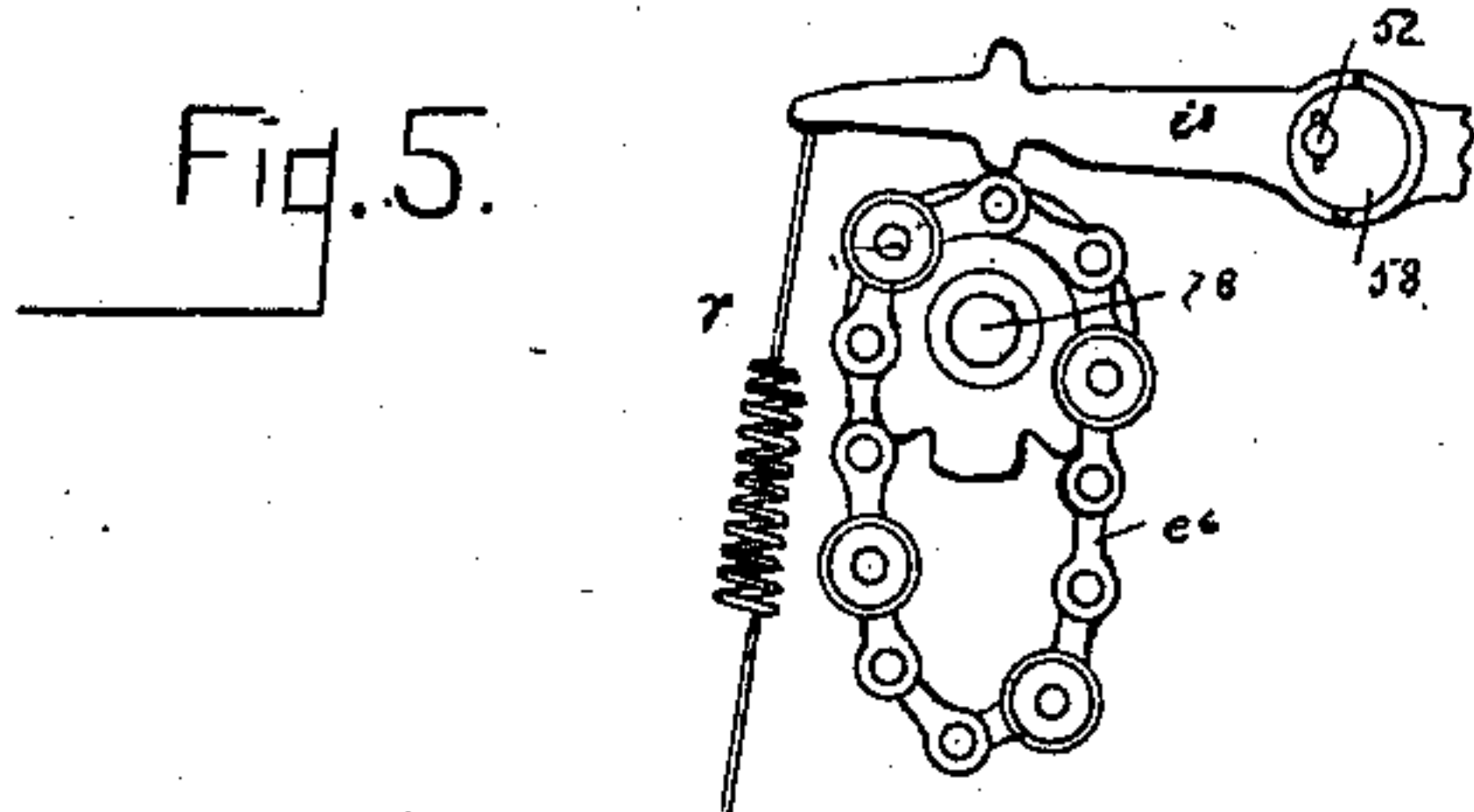
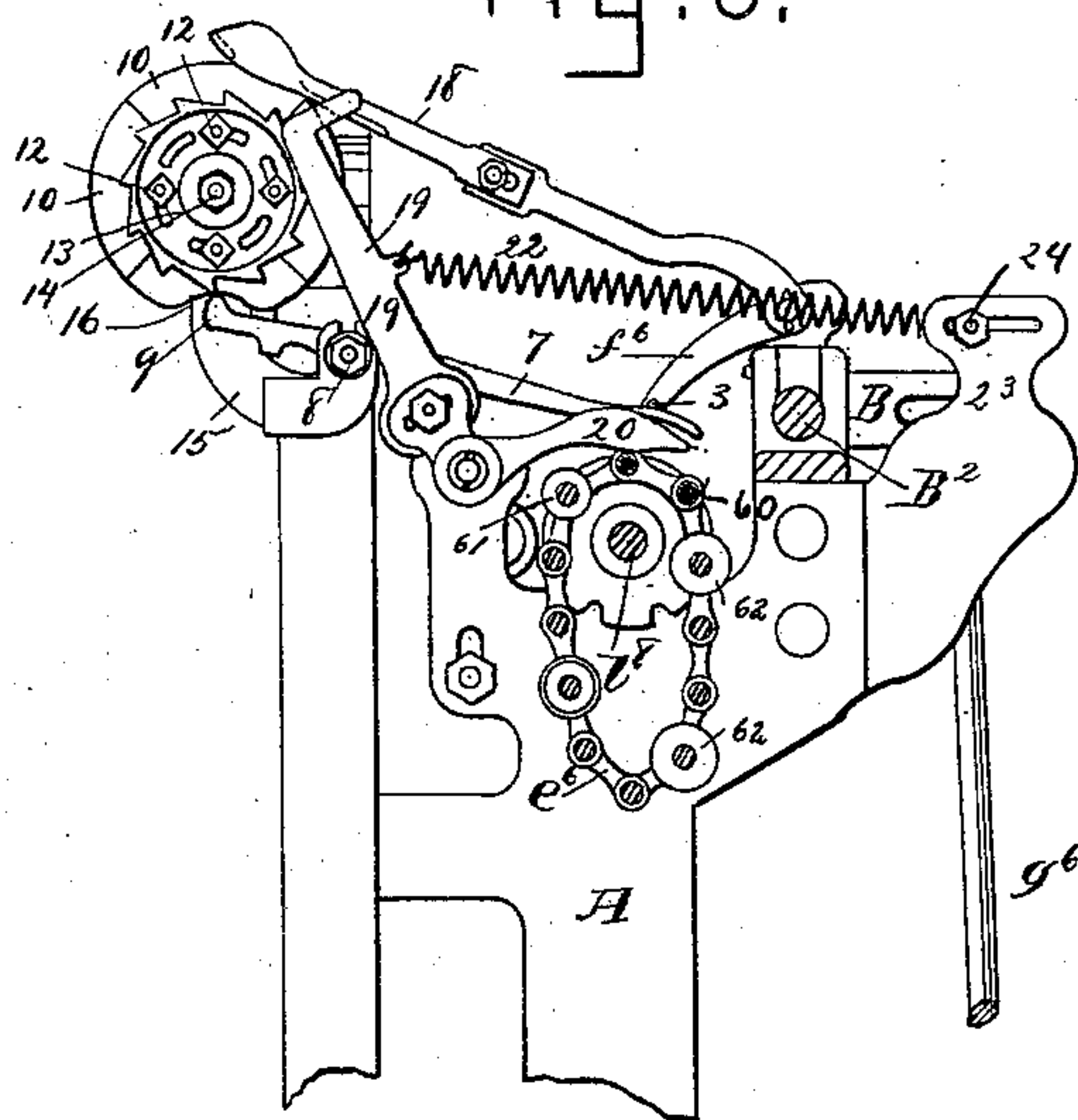


Fig:2.



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UNITED STATES PATENT OFFICE.

HORACE WYMAN, OF WORCESTER, MASSACHUSETTS.

PATTERN DEVICE FOR SHUTTLE-BOX-OPERATING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 364,696, dated June 14, 1887.

Application filed December 9, 1881. Serial No. 47,458. (No model.)

To all whom it may concern:

Be it known that I, HORACE WYMAN, of the city and county of Worcester, State of Massachusetts, have invented an Improvement in Looms, of which the following description, in connection with the accompanying drawings, is a specification.

This invention has for its object to automatically suspend the movement of the main pattern-chain for the shuttle-boxes of a loom whenever it is desired to employ for a number of times in succession any one shuttle, such suspension of movement enabling the said chain to be materially shortened.

My invention consists of certain organizations of mechanical devices for such purpose, as will be hereinafter more fully set forth, and specified in the claims.

This invention is an improvement on United States Patent No. 197,754, dated December 4, 1877, heretofore granted to me, to which reference may be had, wherein a series of levers or fingers are operated directly by the indicators of the auxiliary pattern-surface to control the movements of a shuttle-box mechanism.

My invention also consists in an auxiliary pattern-surface and mechanism to control the stopping and starting of the main pattern-chain, the said auxiliary pattern-surface being governed by a row of indicators carried by the main pattern-chain.

Figure 1 represents in partial vertical cross-section a sufficient portion of a loom to enable my present invention to be understood. Fig. 2 is a view of the parts shown in Fig. 1 and part of the other end of the loom-frame to illustrate the filling stop-motion; Fig. 3, a rear side view of the upper part of the loom shown in Fig. 1; Fig. 4, a section of Fig. 2 on the dotted line *xx*; and Fig. 5 is a detail showing the shuttle-box pattern-chain, its cylinder or hub, and shaft, and fingers resting thereon, and part of their connections with the shuttle-boxes.

A ratchet, 2, is secured directly to the inner end of the shaft *7*, which carries the usual pattern-chain, *e*, which (through suitable levers or fingers, *i*, resting thereon, as in my said patent, such fingers being herein shown in dotted lines in Fig. 2 and in full lines in the detail Fig. 5,) determines the order in which the cranks for shifting the shuttle-boxes shall

operate, the said fingers in practice being connected by wires or connectors *r* with the shuttle-box-moving mechanism, as in the said patent, the indicators of the pattern surface or chain *e* acting as cams upon the levers or fingers *i* to move the same.

The ratchet 2 is engaged and moved by the pawl *f* on a pawl-carrier, B, connected by rod *g* with the lever *h*, actuated by cam *i*. (Shown in dotted lines, Fig. 1.) This lever is connected with the hooked rod *k*, which is extended through the sliding bar *m*. The lever *h* has connected with it an auxiliary arm, *a*, held up to the cam *d* by a spring, *c*, all as shown in Fig. 1. These parts so far described are substantially the same as those designated by the same letters in my said patent, so need not be herein more fully described.

The sliding bar *m* is herein shown as lifted by the arm 4, which projects from the usual stop-rod below the breast-beam C, the said rod having a finger, 6, near its other end, as in Patent No. 129,640, granted to me July 16, 1872, the said finger being in line with the sliding part of the web-fork 40. The shaft of the pattern-chain will be prevented from overrunning in any usual way—as, for instance, as represented in United States Patents No. 491, dated November 25, 1837, and No. 11,933, dated November 13, 1854. If the pawl *f* drops sufficiently to engage the ratchet-wheel 2, the pattern-chain *e* will be moved at each thrust of the pawl. To obviate this and lift the pawl *f* when the rolls or indicators of a bar of the pattern-chain are to be used to enable any one shuttle to be used for two or more successive shots, the said pawl has a pin, 3, which extends therefrom over the end of the pawl-lifter 7, pivoted at 8, between the main pattern surface or chain and the auxiliary pattern-surface. The rear end, 9, of the pawl-lifter 7 is extended under and so as to be directly acted upon by the auxiliary shuttle-box pattern surface or cam, which is composed of several sectional concentric plates, 10, secured by bolts 12 to a ratchet-wheel, 13, on a stud, 14, held in a bracket, 15, attached to the loom-frame A. One or more of these plates may be provided with a depression, as at 16, Fig. 3, to act as a cam or indicator to enable the rear end, 9, of the pawl-lifter 7 to rise and permit the front end of the said lifter

to fall and with it permit the pawl f^6 to engage the teeth of and move the ratchet-wheel 2 one or more times in succession, according to the requirements of the cloth being woven.

5 The ratchet-wheel 13, which carries the auxiliary shuttle-box pattern surface or cam, has reciprocating above it, as herein shown, a pawl, 18, having the same center of motion as the pattern-chain-moving pawl f^6 . This pawl
10 18 may be made to engage the teeth of the ratchet 13, and move it and the auxiliary shuttle-box pattern-surface at every rotation of the cam-shaft D; or, if desired, the said pawl 18 may be controlled as to its times of
15 engagement with the ratchet 13 by a pawl-rest, 19, having its pivot or fulcrum between the auxiliary pattern-surface and the pattern-chain c^6 , and having an arm, 20, (see Figs. 2 and 3,) which is extended backward over one
20 line of indicators or rolls and spaces of the usual main pattern surface or chain, c^6 , the said arm being held down thereon by the spring 22, connected with the said pawl-rest and with an adjustable pin, 24, in the bracket
25 23, or by the weight alone of the arm 20.

It will be supposed that the ratchet 13 has twelve teeth, and that its attached cam has but one depression, 16. If ratchet 13 be moved by pawl 18 one tooth at a time, the
30 pawl f^6 will be lifted for an interval covering eleven movements of the said pawl, during which time the ratchet 2 and chain c^6 will remain at rest.

The indicators or rolls of the pattern-chain
35 c^6 , which act on the arm 20 of the pawl-rest 19, are of different diameters or sizes, and will be so arranged as to move the pawl-rest 19 more or less to enable the pawl 18 to remain in engagement with the ratchet 13 dur-
40 ing more or less of its movement to thus effect the movement of the ratchet 13 of the auxiliary pattern-surface a distance equal to three teeth, or two teeth, or one tooth, and consequently the said auxiliary pattern-surface
45 may be made to suspend the action of the pawl f^6 during intervals covering 11, 5, and 3 of the movements of the said pawl.

The pawl 18, when in its lowest position, has a movement sufficient to actuate the ratchet
50 13 for a space of three of its teeth, but by moving it to different heights by different-sized rolls of the main pattern-chain, acting directly on the arm 20 of the pawl-rest 19, the said pawl 18 may be made to move the said ratchet
55 a distance equal to two teeth or one tooth, or by causing it to become completely lifted, owing to the absence of a roll, the said pawl 18 will not engage the ratchet at all. In this way
60 a very short main pattern surface or chain may be made to operate a set of four or six shuttle-boxes and enable any usual desired number of successive picks to be put in with the thread of the same shuttle from any one
65 box.

The pawl-carrier for pawls f^6 and 18 is marked B, and it is pivoted at B². (See Figs. 1 and 3.)

To always insure correct movement of the two pattern-surfaces with relation to each other, I take the movement for both from the
70 oscillating pawl-carrier B, the movement thereof in one direction actuating one pattern-surface, as, for instance, the main pattern surface or chain, and in the opposite direction
75 the other surface, as, for instance, the auxiliary pattern-surface, by which means each surface is enabled to properly operate the parts to be moved by it.

I so arrange the means to move both the auxiliary pattern-surface and the main pat-
80 tern surface or chain and also the intermediate parts between them that an indicator on the main pattern surface or chain serves to stop the said chain by effecting the starting of the auxiliary pattern-surface, and through the lat-
85 ter causing the elevation of the pawl-lifter 7, and the said chain is started when the depression 16 of the auxiliary pattern-surface comes above the end 9 of the pawl-lifter 7. Maintaining the main pattern surface or chain
90 c^6 at rest while the pawl 18 actuates the auxiliary pattern-surface enables the employment of a very short chain c^6 .

The main pattern-chain indicators 60 61 62, which act to determine the engagement of the
95 auxiliary pattern-surface-moving pawl 18 with its ratchet, are made of different heights, and by their impingement upon the part 20 of the pawl-rest 19 vibrate said pawl-rest corre-
100 spondingly different distances, and according to the extent of its vibration cause the pawl 18 to engage the teeth of and turn the said ratchet a distance equal to two or three of its
105 teeth, thereby moving the said auxiliary pattern-surface over variable distances. By this means the time required for effecting a revolution of such surface and bringing the de-
110 pression 16 again in the position shown in Fig. 3 is made variable according to the height of the indicator, and the duration of the periods of rest of the main pattern surface or chain is thereby determined.

When the filling breaks, the bar m^6 is lifted, as described in my Patent No. 197,754,
115 of December 4, 1877, referred to, which causes the rod g^6 to stop, and the pawls f^6 and 18 then cease to operate.

The employment of the pawl-lifter 7, arranged as shown and described, and moved directly by the auxiliary pattern-surface, en-
120 ables the latter by that one lever to positively hold out of operation the pawl which directly engages and moves the pattern-chain.

The fingers i^6 have their fulcrums on an eccentric sleeve, placed on the stud 52, and the
125 said fingers are extended horizontally over the shuttle-box chain c^6 , there being a row of indicators for each finger, the fingers being more or less in number, according to the number of cranks to be moved and cells in the shuttle-
130 box.

In this my invention I have arranged the lever which lifts the pawl from the ratchet on the shaft of the shuttle-box pattern-chain, so

that its opposite end is acted upon directly by the auxiliary pattern-surface, thus doing away with other intermediate levers and simplifying the parts. So, also, in my invention the pattern-chain for the shuttle-boxes at times remains at rest, the same row of rolls thereon serving to insure several successive picks of the same shuttle, but all in different sheds.

I do not claim the employment of an auxiliary pattern-surface for controlling the formation of sheds.

Instead of the pattern chain e^6 , I may employ any other usual or suitable pattern surface.

15 I claim—

1. The series of fingers adapted to be connected with devices to effect the movement of a series of shuttle-boxes, the auxiliary pattern-surface, and the main pattern surface or chain provided with rows of indicators on which the said fingers rest, and which are adapted to act as cams to move the fingers by the rotary movement of the said pattern surface or chain, and with a separate row of indicators to control the times of operation and of rest of the auxiliary pattern-surface, combined with intermediate connecting mechanism, substantially such as described, between the main pattern surface or chain and the auxiliary pattern-surface to control the stopping and starting of the said pattern-chain and the auxiliary pattern-surface alternately for a consecutive number of movements, and with means for moving the said main pattern surface or chain and the said auxiliary pattern surface, substantially as described.

2. The series of fingers adapted to be connected with the shuttle-box-moving devices, the main pattern surface or chain carrying rollers or indicators constructed to act as cams to move the said fingers, and a line of indicators to govern the position of the pawl-rest, the ratchet 2, and pawl f^6 , combined with the auxiliary pattern-surface, the ratchet 13, pawl 18, the pawl-carrier carrying both pawls f^6 and 18, and means for operating said pawl-carrier, the pawl-rest 19 20, acted upon directly by the indicators of the chain and engaging directly with the pawl 18, and the pawl-lifter 7, acted upon directly by the auxiliary pattern-surface and engaging directly with the pawl f^6 , said pawl-lifter and pawl-rest being pivoted between the pattern-chain and auxiliary pattern-surface, substantially as described.

3. The main pattern surface or chain provided with indicators to control the movements of a series of shuttle-boxes, its ratchet and pawl, the auxiliary pattern-surface constructed substantially as described, its ratchet and pawl, a carrier common to the two pawls, means for actuating said carrier, and pawl-lifter 7, oper-

ated by the auxiliary pattern-surface to control the pawl which moves the ratchet of the main pattern surface or chain, combined with a pawl-rest having an arm, 20, which is kept constantly pressed against the said main pattern surface or chain, and an arm upon which rests the pawl of the auxiliary pattern-surface, rolls on the said chain acting to move the pawl-rest to lower the said pawl and start the movement of the auxiliary pattern-surface, and rotate the latter to move the said pawl-lifter and leave the main pattern surface or chain at rest, substantially as described.

4. In combination, a main pattern surface or chain carrying rows of indicators to control the movements of shuttle-boxes, and also carrying a secondary row of indicators of different heights to control the movement of an auxiliary pattern-surface, means for operating the said chain, a pawl-rest operated by the secondary indicators, an auxiliary pattern-surface with its actuating ratchet and pawl, and means to move the pawl, whereby the indicators of different heights control the auxiliary pattern mechanism to effect a greater or less range of movement thereof, according to the heights of the indicators on the main pattern surface or chain, substantially as described.

5. The pattern surface or chain carrying the indicators to control the movement of a series of shuttle-boxes, and also carrying a secondary line of indicators of different diameters or heights, its actuating ratchet-wheel and pawl, and means to actuate said pawl, and the pawl-rest operated by the said chain, combined with the auxiliary pattern-surface, its actuating ratchet and pawl, means to move said pawl, and the pawl-lifting lever 7, operated thereby to control the movement of the main pattern-surface, substantially as described.

6. An auxiliary pattern-surface, its ratchet-wheel, pawl 18, means to move the said pawl, a pawl-rest having an arm, 20, a pattern-chain provided with rolls of different diameter to move the said rest for different distances to enable the pawl 18 to move the auxiliary pattern-surface for a distance equal to one, two, or three teeth, combined with the pawl-lifter 7 and pawl f^6 , and with means to move said pawl f^6 , the absence of a roll of the pattern-chain from under the said arm 20 causing the pawl-rest to lift the pawl 18 and determine the duration of rest of the main pattern-surface, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORACE WYMAN.

Witnesses:

H. L. ADAMS,
J. B. SYME.