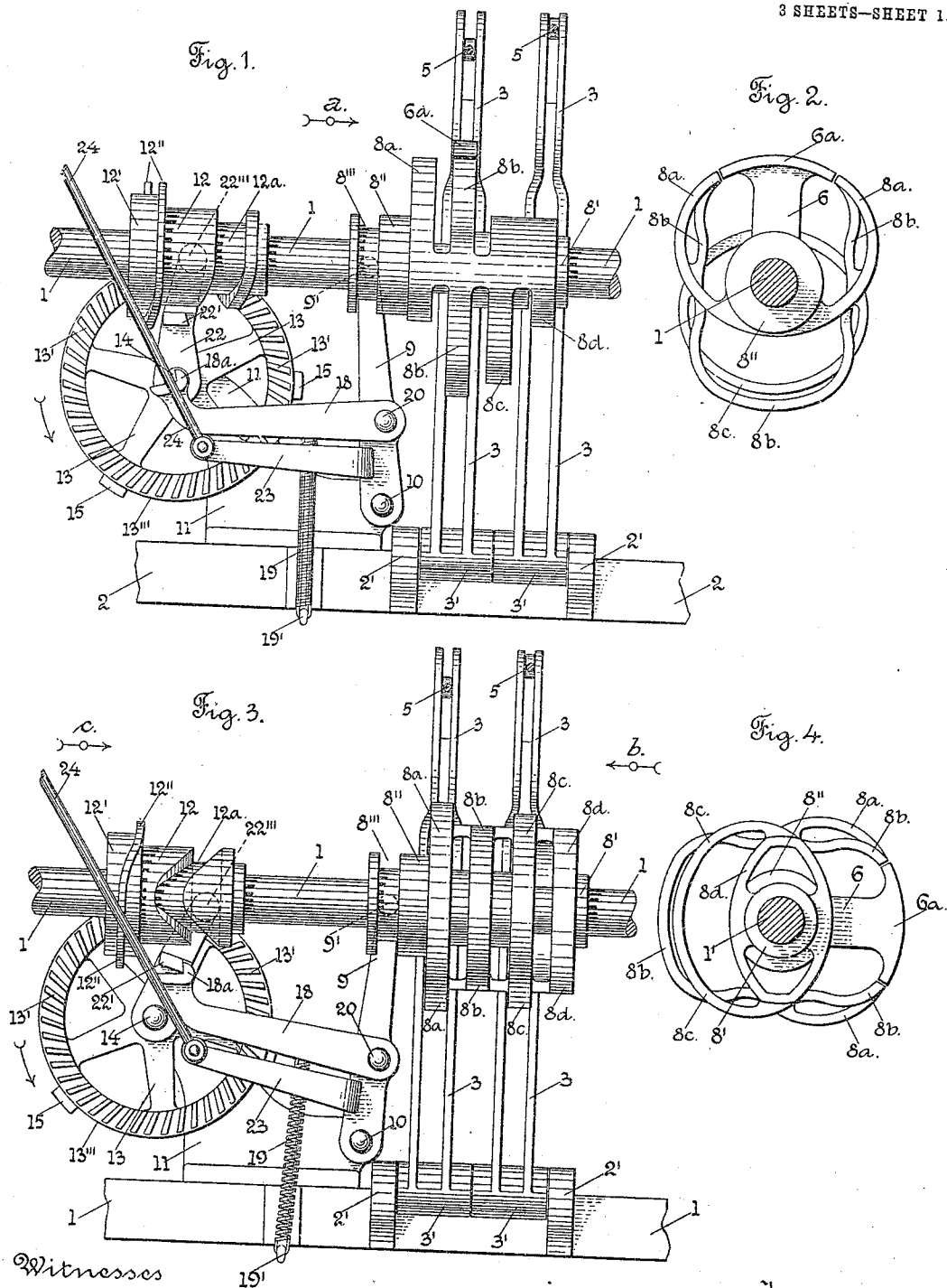


H. WYMAN.
CAM MECHANISM.
APPLICATION FILED JUNE 17, 1909.

957,724.

Patented May 10, 1910.
3 SHEETS—SHEET 1.



Witnesses
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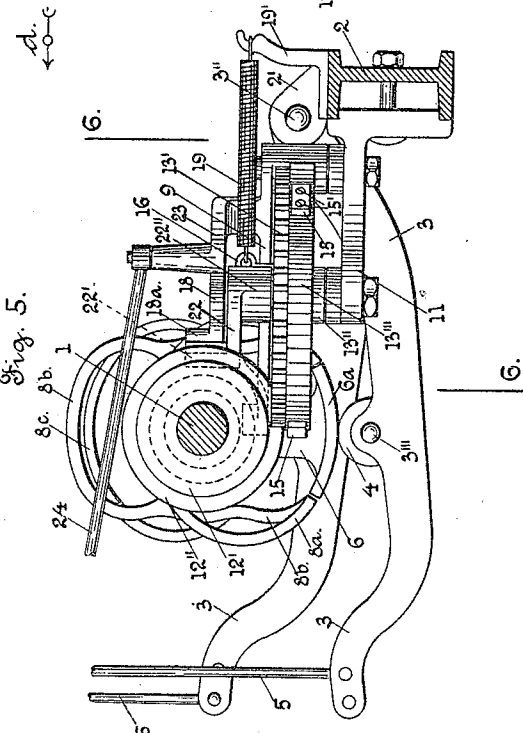
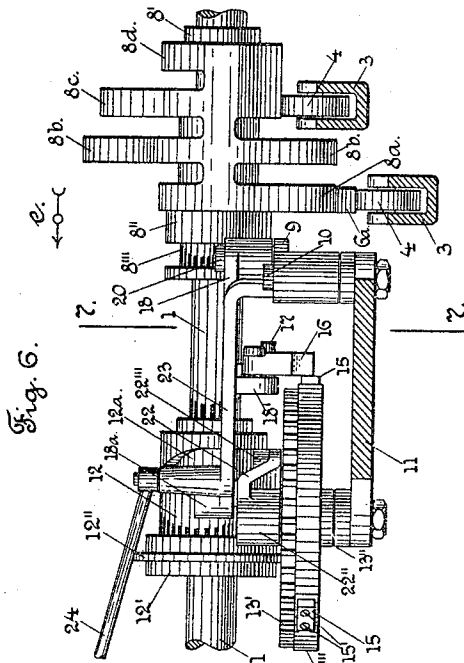


Fig. 6.

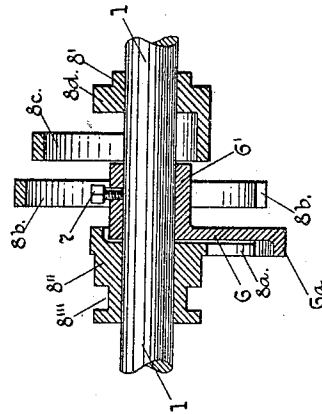


Fig. 8.

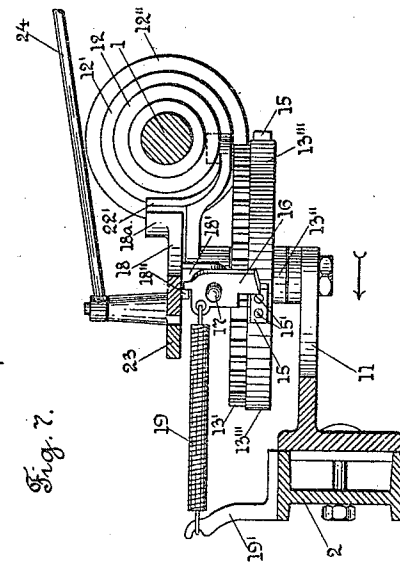


Fig. 7.

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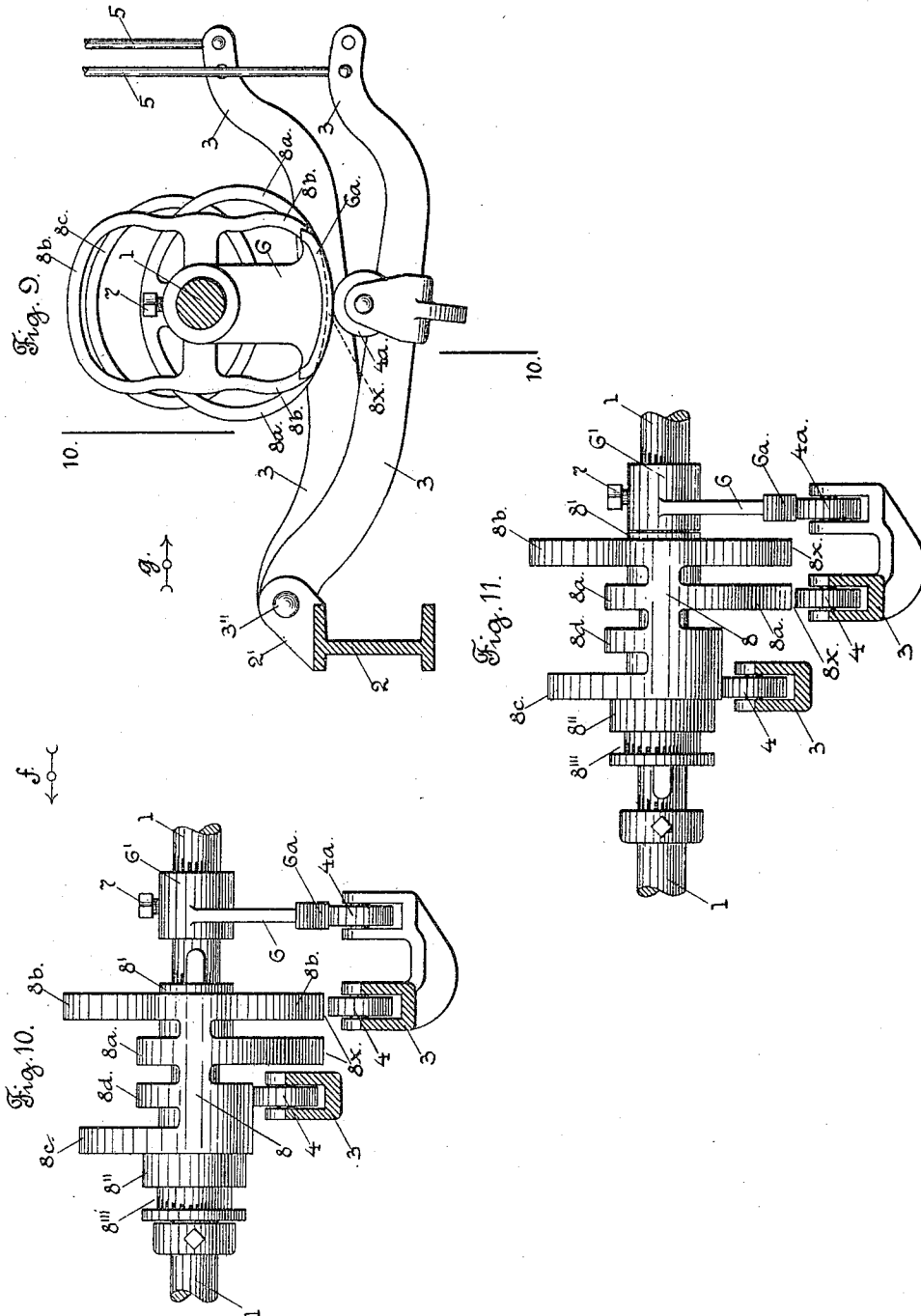
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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CAM MECHANISM.

957,724.

Specification of Letters Patent.

Patented May 10, 1910.

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To all whom it may concern:

Be it known that I, HORACE WYMAN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Cam Mechanism, of which the following is a specification.

My invention relates to a cam mechanism which is particularly intended to be used on looms having two harnesses, which are reciprocated vertically through two levers, operated by my cam mechanism, which is preferably located on the bottom shaft of the loom.

The object of my invention is to provide an improved cam mechanism, comprising a set of cams carried on a hub or hubs, and movable endwise on a shaft, for communicating to two harnesses, through two levers, a reciprocating movement for a certain number of picks, to make for instance a doup or leno weave, when the set of cams is in one position, and to automatically change the position of the cams for another number of picks, to obtain a plain weave, and the particular object of my invention is to provide an improved mechanism for automatically operating the cams, to produce, through the movement of the harnesses, two different kinds of weaves at predetermined intervals in the fabric.

My invention consists in certain novel features of construction of my improvements as will be hereinafter fully described.

I have only shown in the drawings parts of a cam mechanism for a loom, embodying my improvements, sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:—Figure 1 is a plan view of the cam mechanism, and operating mechanism therefor, embodying my improvements, detached. Fig. 2 shows the cam mechanism shown in Fig. 1, detached, looking in the direction of arrow *a*, same figure. Fig. 3 corresponds to Fig. 1, but shows the parts in a different position. Fig. 4 shows the cam mechanism shown in Fig. 3, detached, looking in the direction of arrow *b*, same figure. Fig. 5 is a side view of the parts shown in Fig. 3, looking in the direction of arrow *c*, same figure. Fig. 6 is a section, on line 6, 6, Fig. 5, looking in the direction of arrow *d*, same figure. Fig.

7 is a section, on line 7, 7, Fig. 6, looking in the direction of arrow *e*, same figure. Fig. 8 is a central transverse section through the cam mechanism. Fig. 9 shows a modified construction of the cam mechanism, looking in the direction of arrow *f*, Fig. 10. Fig. 10 is a section, on line 10, 10, Fig. 9, looking in the direction of arrow *g*, same figure, and, Fig. 11 corresponds to Fig. 10, but shows the cam mechanism in a different position.

In the accompanying drawings, 1 is the bottom or driving shaft of a loom, 2 is a portion of a cross girt, 3, 3 are two levers, having their hubs 3' pivotally mounted on a stud 3'', secured in ears 2' on the cross girt 2, see Fig. 5. The two levers 3, 3 are in this instance each made double, as shown in Fig. 1, and each lever carries a pin 3''', on which is loosely mounted a roll 4, see Fig. 5, to engage the cams. The free ends of each lever 3 has pivotally connected therewith the lower end of a rod or connector 5, which connects each lever 3 with a harness, not shown.

The cam mechanism of my improved construction, shown in Figs. 1 to 8, inclusive, consists in this instance of an arm 6 having its hub 6', see Fig. 8, secured upon the bottom shaft 1, in this instance by a set screw 7, to revolve with said shaft. The arm 6 has the segment or arc-shaped surface 6^a, see Figs. 2 and 4, which forms a part of, and completes the engaging surface of the operating cam, see Fig. 5. The other part of the cam mechanism, which is movable relative to the part 6, is preferably made in one piece or casting, and has two hub portions 8', 8'', see Figs. 6, and 8, which are loosely mounted on the shaft 1, to move in the direction of the length of said shaft. Extending out from the hub portions 8', and 8'' are the cam surfaces 8^a, 8^b, 8^c, and 8^d, forming two pairs or a set of cams, to be moved into the path of and engage a roll 4 on each of the levers 3.

Two of the cam surfaces 8^a, and 8^b, are cut out, leaving an incomplete cam surface, and in the longitudinal movement of the hubs 8' and 8'' on the shaft 1, one or the other of these open places in the cam surfaces are moved into alinement with the segment 6^a on the part 6, to form a complete cam surface, and held in such position to revolve with the segment 6^a, when the shaft 1 is revolved.

The set of cams slides loosely upon the shaft 1, and may be moved on said shaft, from the position shown in Fig. 1 to the position shown in Fig. 3. One hub 8'' of the
 5 to receive a stud or pin 9' on the end of a lever 9, which is pivotally mounted on a pin 10 on a stand 11 which is secured to the cross girt 2, see Figs. 1, and 3.

10 On the shaft 1 is secured, to rotate therewith, a collar 12, which in this instance has the enlarged part 12', with a single worm thread 12'' thereon, which meshes with the
 15 toothed portion 13', in this instance on one side or face of a worm gear 13, to revolve said gear the distance of one tooth, on every revolution of the shaft 1, in the direction indicated by the arrow, Figs. 1 and 3. The
 20 gear 13 has its hub 13'' loosely mounted on a stud 14 on the stand 11 secured to the cross girt 2, and has a smooth periphery 13''' extending beyond the toothed portion, see Fig. 7. On the smooth portion 13''' of the
 25 worm gear 13, are preferably removably secured, in this instance by screws 15', blocks or extensions 15, extending out from the smooth portion 13''', and forming in this instance pattern or indicating surfaces. When the worm gear 13 revolves in the di-
 30 rection indicated by the arrow in Figs. 1 and 3, the blocks 15 are adapted to engage a latch 16, pivotally mounted on a stud 17 on an extension 18' on a lever 18, see Figs. 6 and 7.

35 The latch 16 is held from moving on the lever 18 in one direction, by engaging a lug or projection 18'', see Fig. 7, and is yieldingly held against said lug by a helically coiled contraction spring 19, attached at one
 40 end to the latch 16, and at its other end to a stationary stand 19' on the cross girt 2. The latch 16 may move in the direction of the arrow, Fig. 7.

The lever 18 is pivotally mounted on a
 45 stud 20 on the lever 9, see Figs. 1 and 3, and the helically coiled contraction spring 19, which is attached at one end to the latch 16, and at its other end to the stand 19', acts to move down the lever 18 and disen-
 50 gage the projection 18^a thereon from a projection 22' on an oscillating lever 22, see Fig. 1. The lever 22 has its hub 22'' loosely mounted on the stud 14, and has on its end a boss or projection 22''', which extends in
 55 the path of and is adapted to be moved by the cam-shaped groove 12^a in the collar 12, at every revolution of the shaft 1. When, by the engagement of a block 15 with the latch 16, the lever 18 is moved to bring its
 60 engaging end 18^a in the path of the projection 22' on the lever 22, the movement of said lever 22, through its engagement with the cam groove in the collar 12 on the shaft 1, will move the lever 18 toward the right
 65 in Fig. 1, and also move the lever 9 toward

the right, and through the engagement of said lever 9 with the set of cams will be moved from the position shown in Fig. 1, to the position shown in Fig. 3. The engagement of the block 15 with the latch 16 on the lever 18, acts to hold the lever 18 and the lever 9 in the position shown in Fig. 3, as long as the block 15 remains in engagement with the latch 16. On a partial
 70 rotation of the worm gear 13, the block 15 moves by the latch 16, and the spring 19 acts to move back the lever 18 and the lever 9 to the position shown in Fig. 1, and hold them in this position until, in the continued revolution of the worm gear 13, the next
 75 block 15 thereon engages the latch 16.

An arm 23 is rigidly connected to the lever 9, and to the end of said arm 23 is pivotally connected one end of a rod or
 80 connector 24, which is adapted to operate mechanism connected with the take-up of a loom, which take-up, not shown, may be of any usual construction.

In the modified construction of the cam mechanism shown in Figs. 9, 10, and 11, the
 90 same letters of reference are used on similar parts as in the previous figures.

The arm 6 is secured outside of the set of cams. In this instance the hub 6' of the
 95 arm 6 is secured upon the bottom shaft 1 by a set screw 7, to revolve with said shaft.

The set of cams is in this instance splined upon the bottom shaft 1 to rotate therewith, and is adapted to be moved longitudinally on said shaft. One of the harness levers 3
 100 is provided with two rolls 4, and 4^a. The roll 4 engages the cam surfaces on the set of cams, and the roll 4^a is in the path of and engages with the arc-shaped segmental portion 6^a on the arm 6, on every revolu-
 105 tion of the bottom shaft, as shown in Figs. 9, 10, and 11. The segmental portion 6^a is made to sustain all the upward pressure of the harness lever, by providing the concentric portion of the set of cams with a slight
 110 depression, as shown by broken lines at 8^x, Fig. 9, and at this time the set of cams are free to be moved lengthwise on the shaft 1.

It will be understood that the details of construction of my improvements may be
 115 varied if desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a cam mechanism, a set of cams, as
 120 8^a, 8^b, 8^c, and 8^d, movable on a shaft, a plurality of said cams having a concentric portion of their circumference removed a corresponding concentric segmental surface, as 6^a fast on said shaft, and means to move
 125 said set of cams, to cause said segmental surface to be interposed in place of the removed surface of one or the other of said plurality of cams.

2. In a cam mechanism, a set of cams on a 130

hub movable on a shaft, comprising two
pairs of cams, as 8^a, 8^b, and 8^c, 8^d, two har-
ness levers, one actuated by one of one pair
of cams, and the other by one of the other
5 pair of cams, means to move the set of
cams endwise on a shaft, and one pair of
cams, as 8^a and 8^b, having the concentric
portion removed, a hub fast on said shaft,
having a concentric surface, as 6^a, similar to
10 that removed from the cams, to sustain a
lever, as the concentric portion passes over it.
3. In a cam mechanism, two pairs of cams

movable longitudinally, to bring either pair
into operative position for two levers, pat-
tern indicators, and intermediate mechan- 15
ism, comprising a lever adapted to be en-
gaged by a pattern indicator, to ship the
cams endwise, and an intermittently mov-
ing lever to return the first mentioned lever
to its normal position.

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Witnesses:

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