

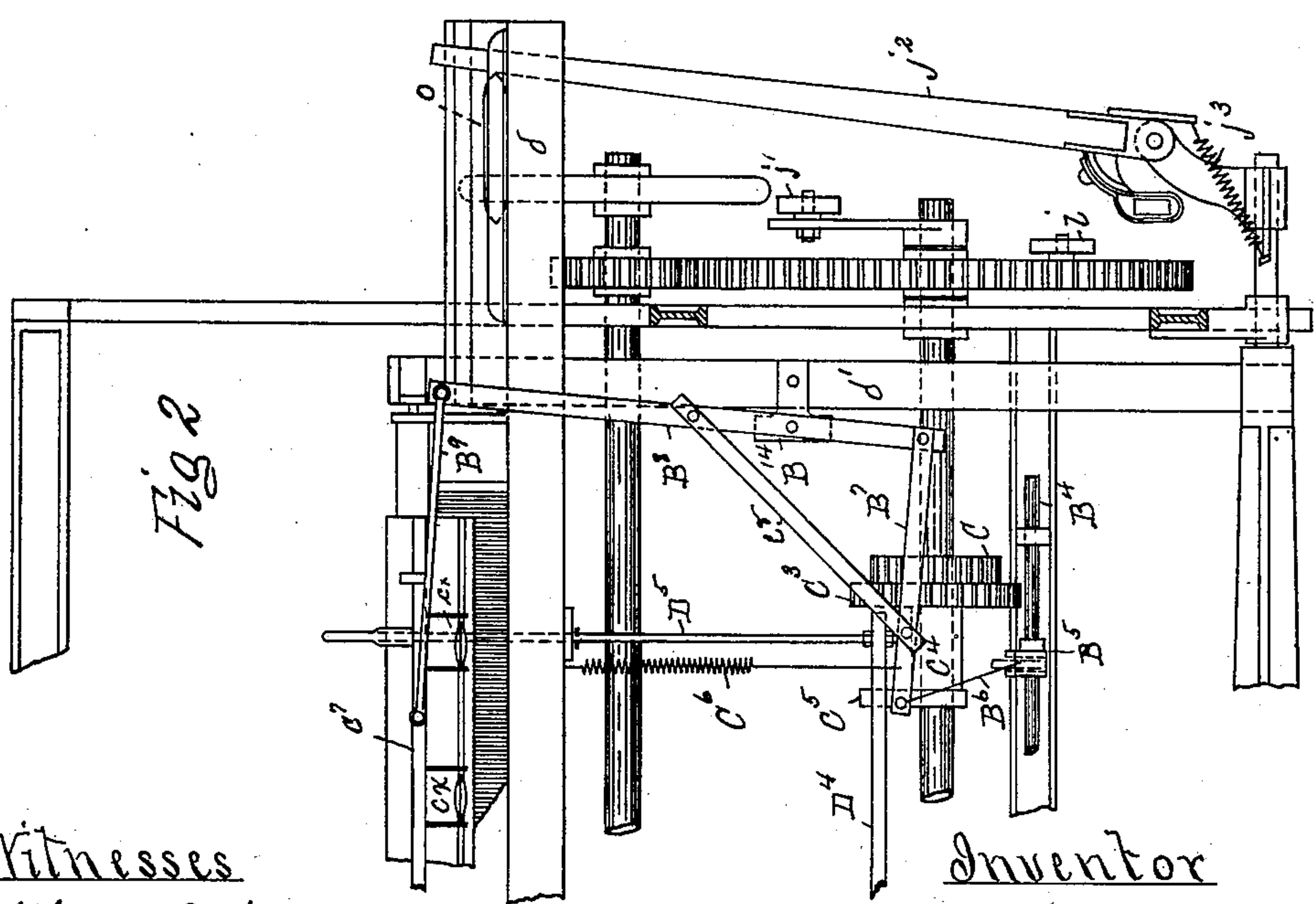
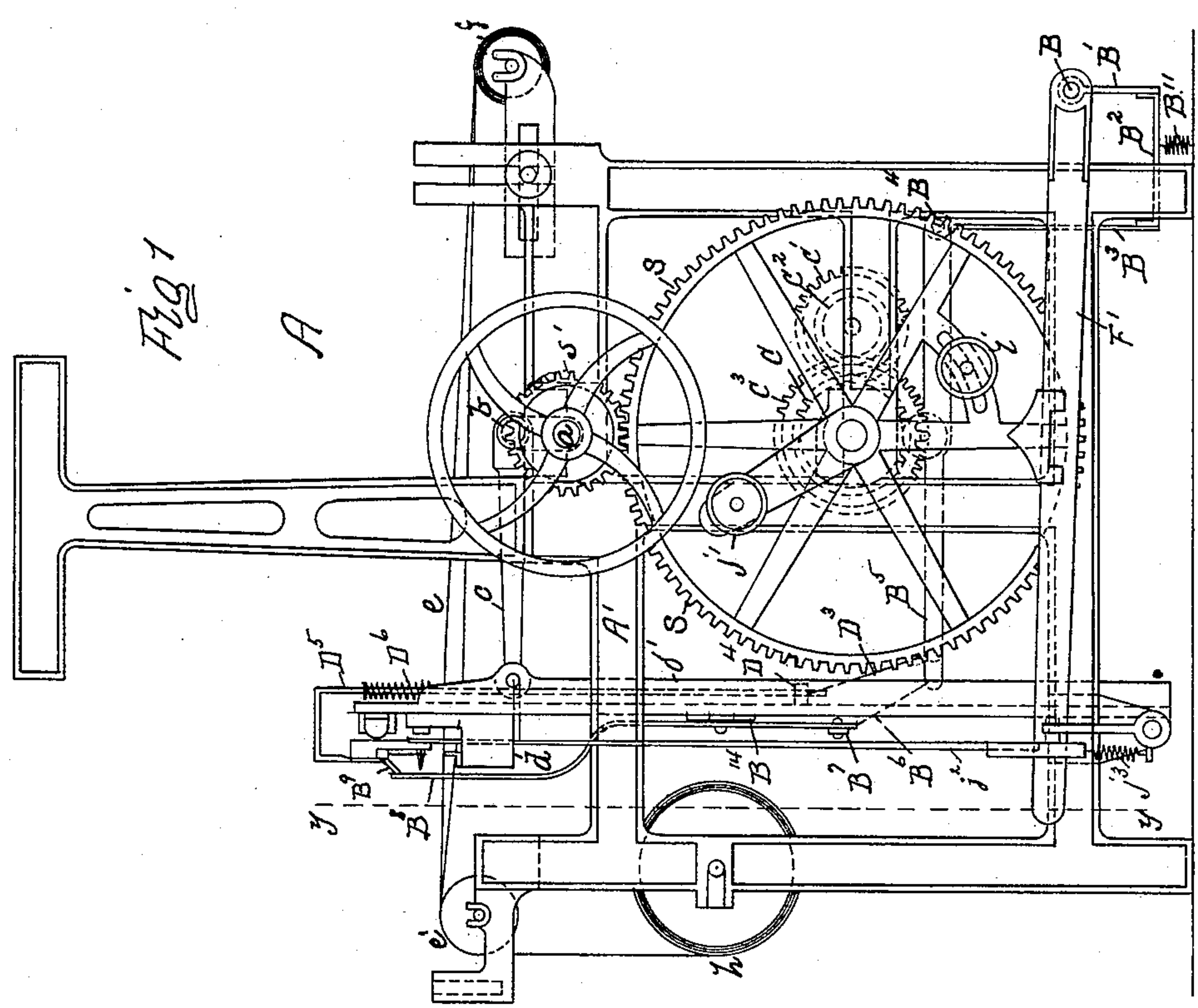
(No Model.)

3 Sheets—Sheet 1.

J. KENNEDY.
LOOM.

No. 435,565.

Patented Sept. 2, 1890.



Witnesses
Alfred B. Watson
H. Little

Inventor
John Kennedy

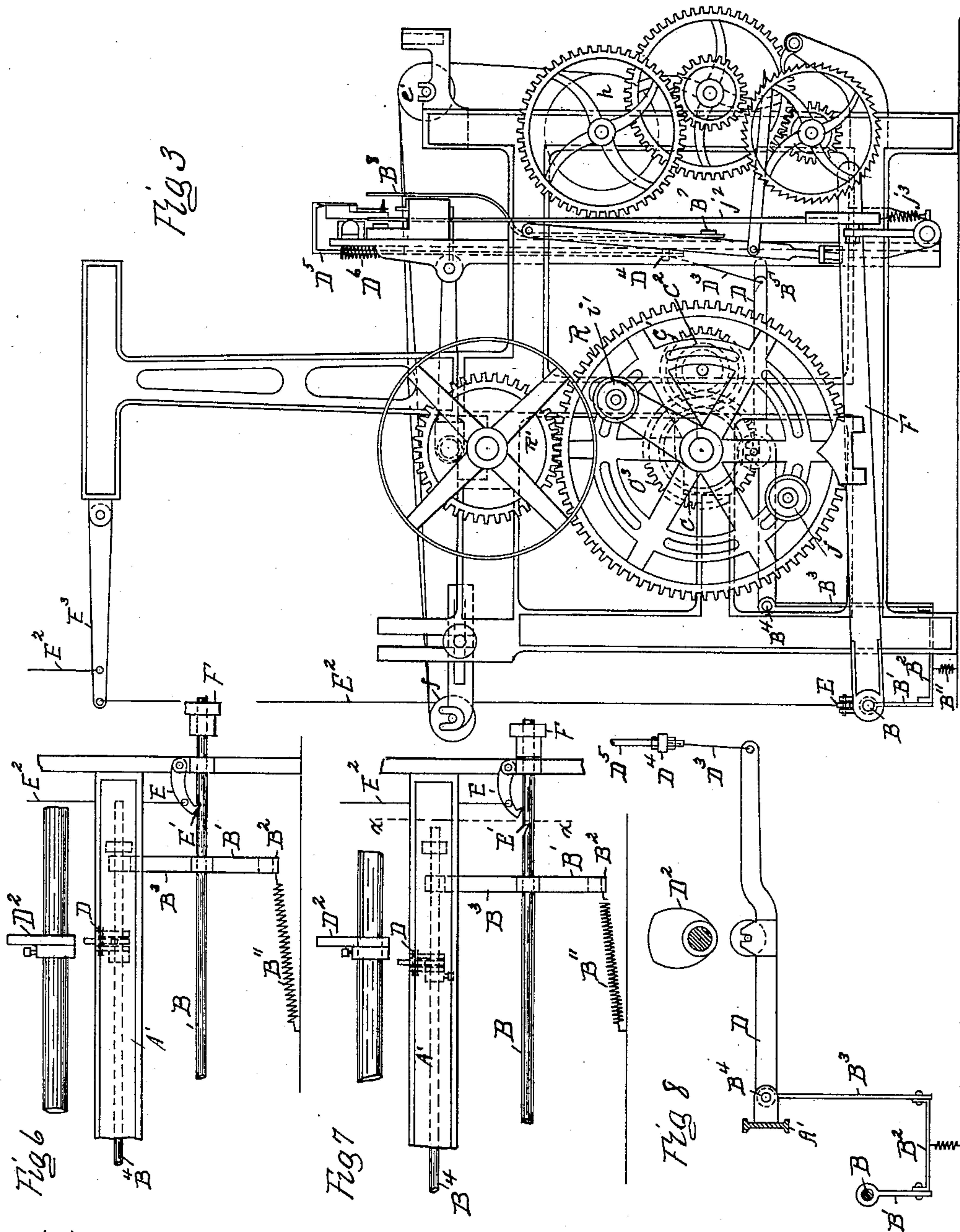
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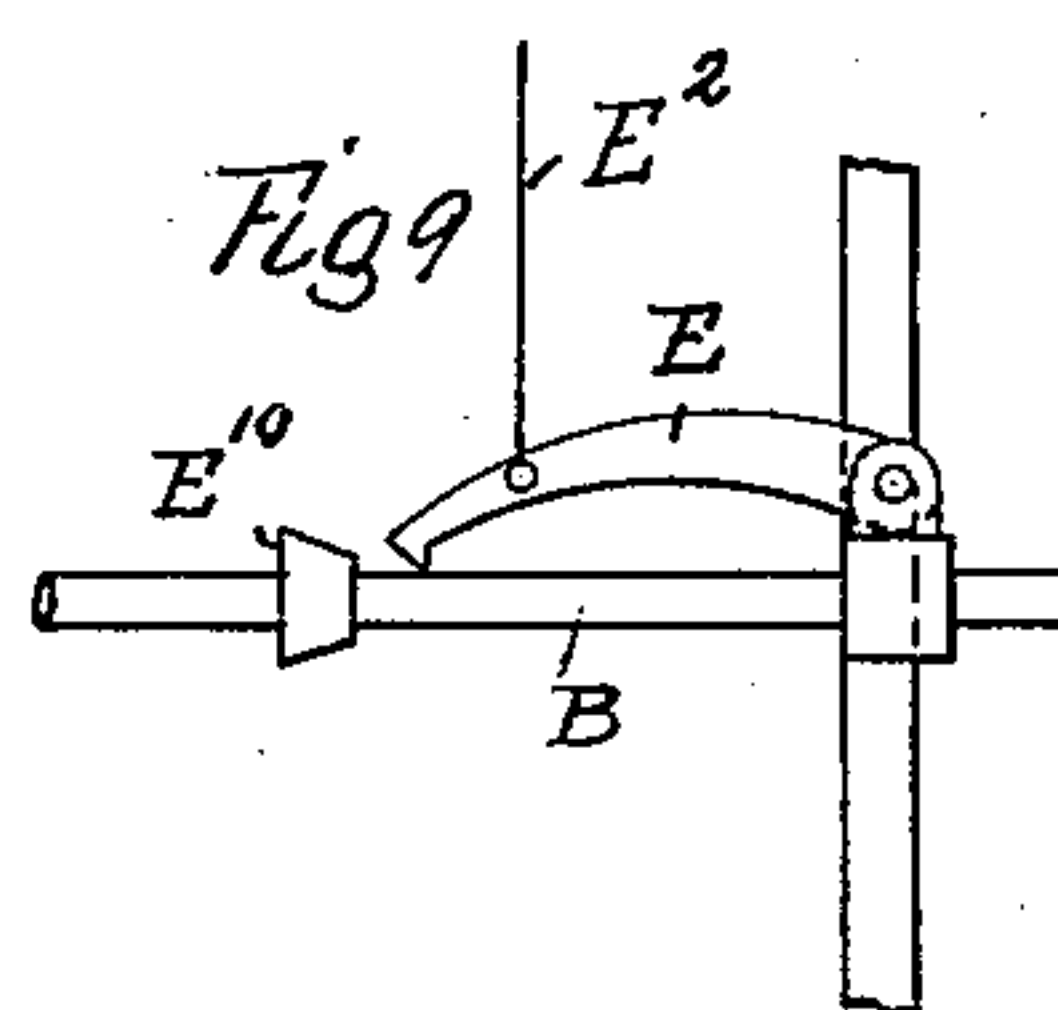
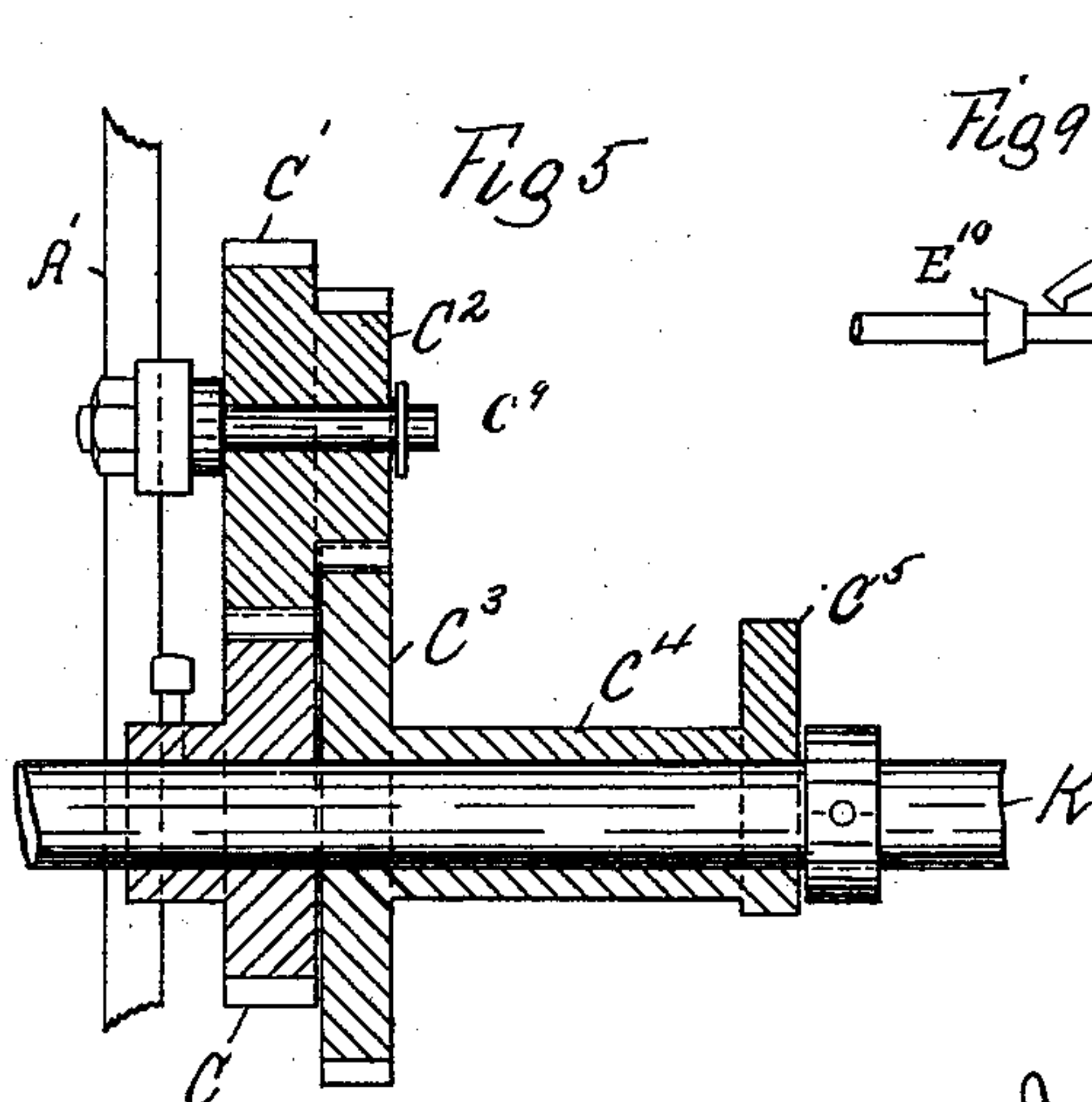
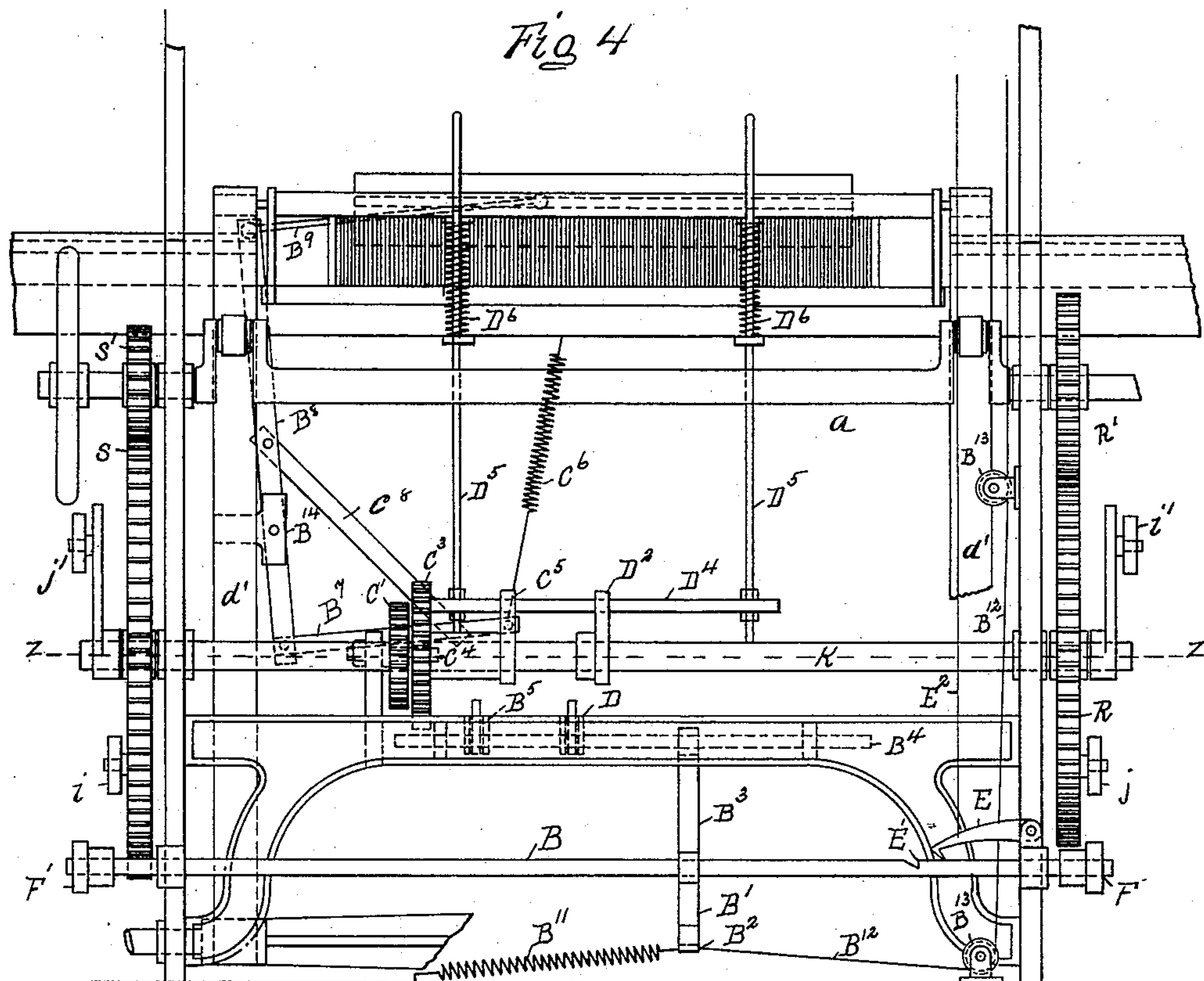
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UNITED STATES PATENT OFFICE.

JOHN KENNEDY, OF PATERSON, NEW JERSEY, ASSIGNOR OF ONE-HALF TO
THE FLORENCE SILK COMPANY, OF SAME PLACE.

LOOM.

SPECIFICATION forming part of Letters Patent No. 435,565, dated September 2, 1890.

Application filed January 7, 1889. Serial No. 295,665. (No model.)

To all whom it may concern:

Be it known that I, JOHN KENNEDY, a citizen of England, residing at Paterson, Passaic county, State of New Jersey, have invented a new and useful Improvement in Looms, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to mechanism for changing the weaving in swivel-loom from plain weaving wherein the fly-shuttle is used exclusively to plain and swivel weaving combined, wherein the fly-shuttle is restricted in its movement and swivel-shuttles are introduced to form figures in the fabric. Usually this change from plain weaving to plain and swivel weaving combined has been effected by an endwise movement of the cam-shaft in looms. This mode of changing the weaving from plain weaving to plain and swivel weaving combined requires devices somewhat complicated in their construction—as double-grooved cams, a beam carrying studs to enter the grooves in said cams, face-cams, &c.—which, owing to their complexity, are somewhat uncertain in their action, and are therefore objectionable.

The object of my present invention is to provide means for changing the weaving in swivel-loom from plain weaving to plain and swivel weaving combined which shall possess the advantages of the former mode of making such change, but which shall be free from its objectionable features.

My invention consists in certain features of construction and combination of parts, as will be hereinafter fully described, and pointed out in the claims.

Figure 1 of the drawings shows in elevation one end of a swivel-loom of ordinary build with my invention attached. Fig. 2 is a part front elevation of the same. Fig. 3 shows in elevation the opposite end of the loom with my invention thereon. Fig. 4 is a rear elevation of the loom with my invention attached. Fig. 5 shows in section a portion of the cam-shaft, sleeve, gear, &c., on line Z Z of Fig. 4, detached. Fig. 6 shows in detail a portion of the changing devices in the position which they occupy when the movement of the fly-shuttle is restricted and the swivel-

shuttles are in operation. Fig. 7 shows the parts of Fig. 6 in the position which they occupy when the fly-shuttle is in full operation and the swivel-shuttles are at rest. Fig. 8 is a detail of cam, treadle, &c., part sectional, on line X X of Fig. 7; and Fig. 9 is a modification of certain parts shown in Figs. 4, 6, and 7.

A represents a swivel-loom of ordinary build, having the usual driving-shaft *a*, crank *b*, arm *c*, lay *d*, cam-shaft K, warp and cloth beams *f*, *e'*, and *h*, cog-wheels R R and S S'. The loom, which is constructed as is usual, need not, it is thought, be further described herein.

In bearings that are arranged in the loom-frame is journaled a shaft B, to move lengthwise, on one end of which shaft a lever F is mounted to rock, and on the other end a lever F' is also mounted to rock, while inward on the shaft B from the lever F is provided a notch E'.

The lever F on the shaft B is adapted to be engaged by a roller *j*, arranged on the cog-wheel R and lever F', by a roller *j'*, arranged on an arm of the cam-shaft K, the action of which rollers upon the levers is adapted to give an inward movement to the picking-sticks *j*² *j*² by means of the usual straps and curved arms to throw the fly-shuttle *o* across the loom, which sticks are returned by the action of springs *j*³ *j*³ in the usual way.

The notch E', arranged in the shaft B, is adapted to receive and accommodate a pawl E on the frame *a'*, arranged for such engagement with the notch E'. An arm B³ is fastened at its top to a shaft B⁴, while the arm B³ at its lower end is connected with an arm B², which latter is connected with an arm B', one end of which is fixed on the shaft B, Fig. 1.

To the arm B² one end of a spring B¹¹ is fastened, the opposite end of which latter is fastened to the floor. To the arm B² is also fastened a cord B¹², that passes over pulleys B¹³ B¹³, one of which is fastened to the frame A' and the other to the floor, while the cord B¹² is attached to the jacquard or other pattern mechanism, not essential to a full understanding of my invention, and therefore not shown in the drawings.

The shaft B^4 , with which the arm B^3 is connected, is mounted in bearings on the frame A' , is adapted to be moved longitudinally by the arm B^3 , as hereinafter stated, and has
5 mounted on it treadles B^5 and D , which treadles are in turn adapted to be acted upon by cams D^2 C^5 , as hereinafter stated.

The cam D^2 is fixed on the cam-shaft K , while the cam C^5 is made integral with a
10 sleeve C^4 , mounted loosely on the cam-shaft, and which has also made integral with it a cog-wheel C^3 , that engages and is actuated by a cog-wheel C^2 , which latter is integral with a cog-wheel C' , that is mounted on a stud C^9 ,
15 fixed in the frame A' , which last-mentioned cog-wheel C' meshes with and receives its motion from a cog-wheel C , fixed to the shaft K , Fig. 5.

To the lay-sword d' is fixed a lug B^{14} , to
20 which is pivoted a lever B^8 , to the upper end of which lever is pivoted a link B^9 , which latter connects with a rack-bar C^7 , while the lower end of the lever B^8 is connected with a horizontal bar B^7 , the inner end of which bar
25 is connected with the treadle B^5 by means of a cord B^6 , and also is connected, by means of a spring C^6 , with the lay d , as shown.

To a horizontally-arranged bar D^4 , connected by a cord D^3 with the treadle D , on
30 which the cam D^2 can act, are fixed by jam-nuts vertical rods D^5 D^5 , which rods are arranged to slide through lugs that are fixed to the lay d , and which rods are each surrounded by a spring D^6 , the rods being con-
35 nected at the upper ends with the swivel-rack in the usual way.

The cog-wheel S , which is loose on the cam-shaft K , should be four times as large in diameter as the cog-wheel S' , with which it
40 gears and from which it receives its motion, namely, to make one revolution to every four revolutions of the wheel S' on the driving-shaft a . The sleeve C^4 revolves around its axis in exact conformity to the cog-wheel S —
45 that is, it makes one revolution to every four revolutions of the wheel S' , while the cam-shaft K makes two revolutions to every one revolution of the sleeve C^4 and cog-wheel S . By this arrangement of speed of the cog-wheels
50 S S' , sleeve C^4 , and shaft K the fly-shuttle o , operated from the wheel R and cam-shaft K , and the swivel-shuttles C^x , actuated by cam C^5 and the wheel S , in point of time move alternately across the loom without interfer-
55 ence.

So that the above movements will be clearly understood, I will now describe how the several picks are made successively, the loom being adjusted for swivel-weaving and the
60 observer being supposed to stand in front of the loom. The fly-shuttle is supposed to be at the right-hand end of the shuttle-race. Both picker-sticks are operated at the same time and are moved toward each other—that
65 is, the right-hand picker-stick is moved from right to left and the left-hand picker-stick from left to right. As the fly-shuttle is at

the right-hand end of the shuttle-race, it is thrown by the right-hand picker-stick from right to left, making plain weaving. Before
70 the fly-shuttle arrives at the left-hand end of the shuttle-race the left-hand picker-stick has been moved back in the direction from right to left, and is thus out of the way and permits the fly-shuttle to remain at rest at the
75 left-hand end of the shuttle-race. At the same time the right-hand picker-stick has been moved from left to right and is in a position of rest. The swivel-shuttles are now lowered and are moved from left to right and
80 weave part of the figure and are then raised. Then the left-hand picker-stick is moved from left to right and throws the fly-shuttle through the race from left to right, making plain weaving, the right-hand picker-stick remaining in
85 a position of rest. The swivel-shuttles are now again lowered and moved from right to left and weave part of the figure and are then again raised. Then both picker-sticks are moved toward each other again, as stated
90 above, and the described operation is repeated, and so on until the loom is adjusted for plain weaving, when the picker-sticks throw the fly-shuttle alternately in opposite directions and the swivel-shuttles are out of action.
95

The loom is supposed to be in motion and performing plain weaving with the devices in the position shown in Fig. 4, at which time the fly-shuttle o , under the combined action of rollers j j' , levers F F' , picking-sticks j^2 j^2 ,
100 and springs j^3 , throws into the fabric the full number of picks or wefts, the swivel-shuttles C^x being at rest. As the plain weaving proceeds and a figure is to be woven into the fabric by the swivel-shuttles C^x , according to
105 the pattern, the jacquard or other pattern mechanism pulls up the cord B^{12} , which action draws the shaft B through its bearings in the direction toward the pawl E until the
110 pawl enters the notch E' and holds the shaft B in position to the right-hand side of the loom, as seen in Fig. 6. The moving of the shaft B by the cord B^{12} , as stated, distends spring B^{11} and puts the same in tension and causes the arm B^3 to carry the shaft B^4 in the
115 same direction with the shaft B , which action of the arm upon the shaft B^4 puts treadles D and B^5 into engagement with cams D^2 and C^5 and puts levers F F' into engagement with rollers i i' on the wheel S and an arm of the
120 crank-shaft, respectively. This change of rollers from j j' to i i' for action upon levers F F' restricts the action of the fly-shuttle o to every other pick, as the roller i is arranged on cog-wheel S , which performs one revolution to
125 every four revolutions of the cog-wheel S' , while the roller i' is arranged on the cam-shaft K , that performs two revolutions to every one revolution of the cog-wheel S' ; hence the skip of the fly-shuttle o at every
130 other pick. The treadles D and B^5 having been put into engagement with cams D^2 C^5 by the moving of the shaft B^4 by the arm B^3 , as stated, the treadle B^5 by means of cord B^6

depresses the inner end of bar B⁷, which action puts in tension spring C⁶, and by means of the lever B⁸, brace C⁸, and link B⁹ moves the swivel-rack C⁷ and swivel-shuttles C^x to the left hand across the loom, as seen in Fig. 2, to form the figure in the fabric. The cam D² by means of the treadle D depresses the bar D⁴, whereby by means of rods D⁵ D⁵ the required downward movement is given to the swivel-rack C⁷, and the springs D⁶ D⁶ are compressed. The fly-shuttle o has thus been restricted to every other pick and the swivel-shuttles C^x thrown across the loom to the left hand in the manner stated to form the figure in the fabric. The spring C⁶ raises the inner end of the bar B⁷, when the treadle is released by the cam, which action of the spring upon the bar, through the lever B⁸, brace C⁸, and link B⁹, throws the swivel-rack C⁷ and shuttles C^x to the right hand across the loom, as seen in Fig. 2, to form the figure in the fabric. The springs D⁶ D⁶ then raise rack C⁷ to remove the same out of the way of the fly-shuttle—that is, when the lever D escapes the action of cam D².

The figure having been woven in the fabric by the swivel-shuttles and the weaving in the loom changed from plain weaving to plain and swivel weaving combined, the cord E² is actuated by the jacquard or other pattern mechanism, which elevates cord E² at the proper time and lifts the pawl E from the notch E', when the spring B¹¹ draws shaft B in the opposite direction from the action caused by cord B¹², which reverses the action of the devices, removes the restriction from the fly-shuttle o, and puts the swivel-shuttles at rest, the same now being in the raised position.

The collar E¹⁰ on the shaft B (shown in the modified construction in Fig. 9) for the action of the pawl may be used instead of the notch E' and the location of the shaft B changed to any other suitable position in the loom without changing the nature of my invention. Hence I do not confine myself to the precise construction or location of the shaft shown.

Having described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a loom-frame, lay, cam-shaft, and picker-sticks, of a shaft mounted to move lengthwise, levers mounted to rock on and move with said shaft when the same moves lengthwise, which levers operate the picker-sticks, treadles connected with said longitudinally-movable shaft and operated by cams on the cam-shaft, a swivel-shuttle box connected with one of said treadles, and devices for shifting the swivel-shuttles in their box connected with the other treadle, substantially as herein set forth.

2. The combination, with a loom-frame, lay, cam-shaft, and picker-sticks, of a shaft mounted to move lengthwise, levers mounted to rock on said shaft and to move with the same when it moves lengthwise, which levers operate the picker-sticks, treadles connected with said longitudinally-movable shaft and operated by cams on the cam-shaft, a swivel-shuttle box connected with one of said treadles, devices for shifting the swivel-shuttles in their box connected with the other treadle, and a latch for locking the longitudinally-movable shaft, substantially as herein shown and described.

3. The combination, with the lay, the picker-sticks, and levers F F', of the shaft B, on which said levers are mounted, having a notch E', the pawl E, means for moving said shaft longitudinally and for lifting said pawl, the shaft K, the rollers i' j', carried by arms thereon, the gears R and S and the rollers i j, carried thereby, the gears R' S', and the crank-shaft, substantially as described.

4. The combination, with the lay, the picker-sticks, and the levers F F', of the shaft B, on which said levers are mounted, having a notch E', the pawl E, means for moving said shaft longitudinally and for lifting said pawl, the shaft K, the rollers i' j', carried by arms thereon, the gears R S and the rollers i j, carried thereby, the gears R' S', the crank-shaft, the shaft B⁴, means for causing it to move endwise with the shaft B, its treadle B⁵, the cam C⁵, mounted on the shaft K, its connected sleeve and gear, the gearing whereby said gear is driven from the shaft K, the actuating-rack for the swivel-shuttle, actuating devices therefor intermediate the same, and the treadle B⁵, substantially as described.

5. The combination, with the lay, the picker-sticks, and the levers F F', of the shaft B, on which said levers are mounted, having a notch E', the pawl E, means for moving said shaft longitudinally and for lifting said pawl, the shaft K, the rollers i' j', carried by arms thereon, the gears R S, the rollers i j, carried thereby, the gears R' S', the crank-shaft, the shaft B⁴, means for causing it to move endwise with the shaft B, its treadle B⁵, the cam C⁵, mounted on the shaft K, its connected sleeve and gear, the gearing whereby said gear is engaged with and driven from the shaft K, the actuating-rack for the swivel-shuttle, actuating devices therefor intermediate the same, the treadle B⁵, the cam B², the treadle D, the swivel-shuttle box, and devices connecting said box with said treadle, substantially as described.

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Witnesses:

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H. H. SANDERSON.