

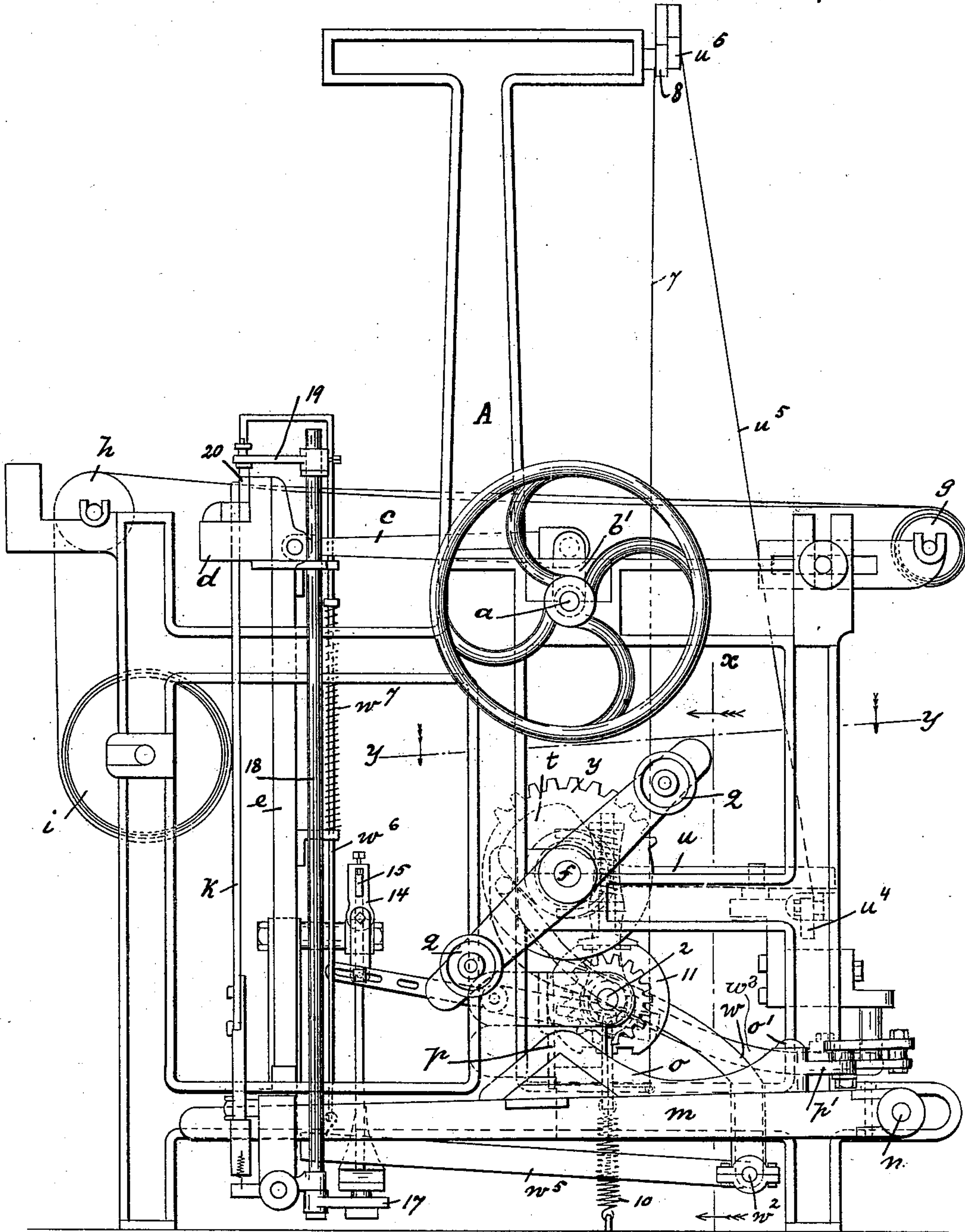
(No Model.)

4 Sheets—Sheet 1.

J. T. KENNEDY.
SWIVEL LOOM.

No. 512,475.

Patented Jan. 9, 1894.



WITNESSES:-

Ex. 1.

INVENTOR:

Wm. S. Hall
J. M. Robertson.

John T. Kennedy

BY

Partner & Co

ATTORNEYS

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

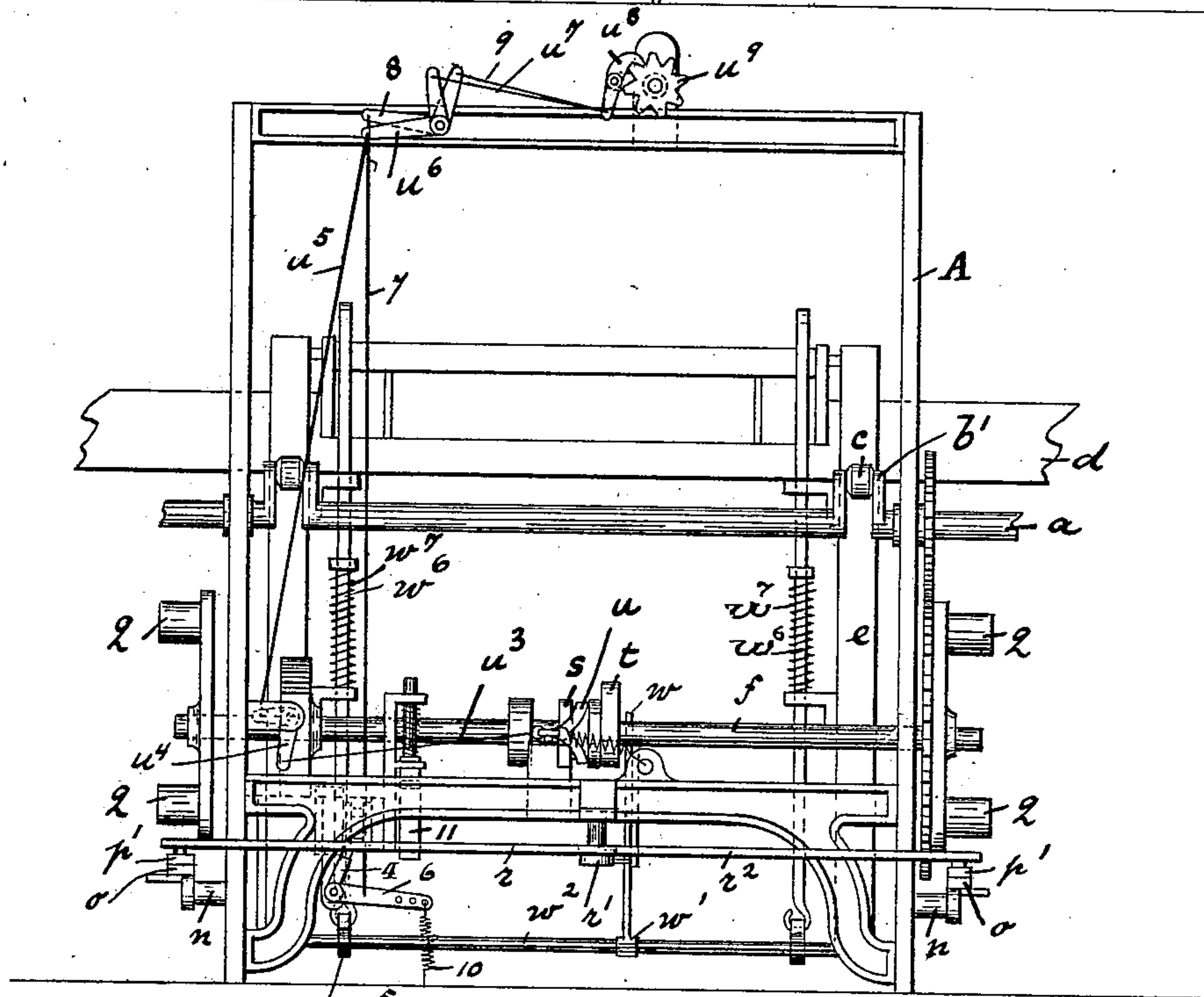
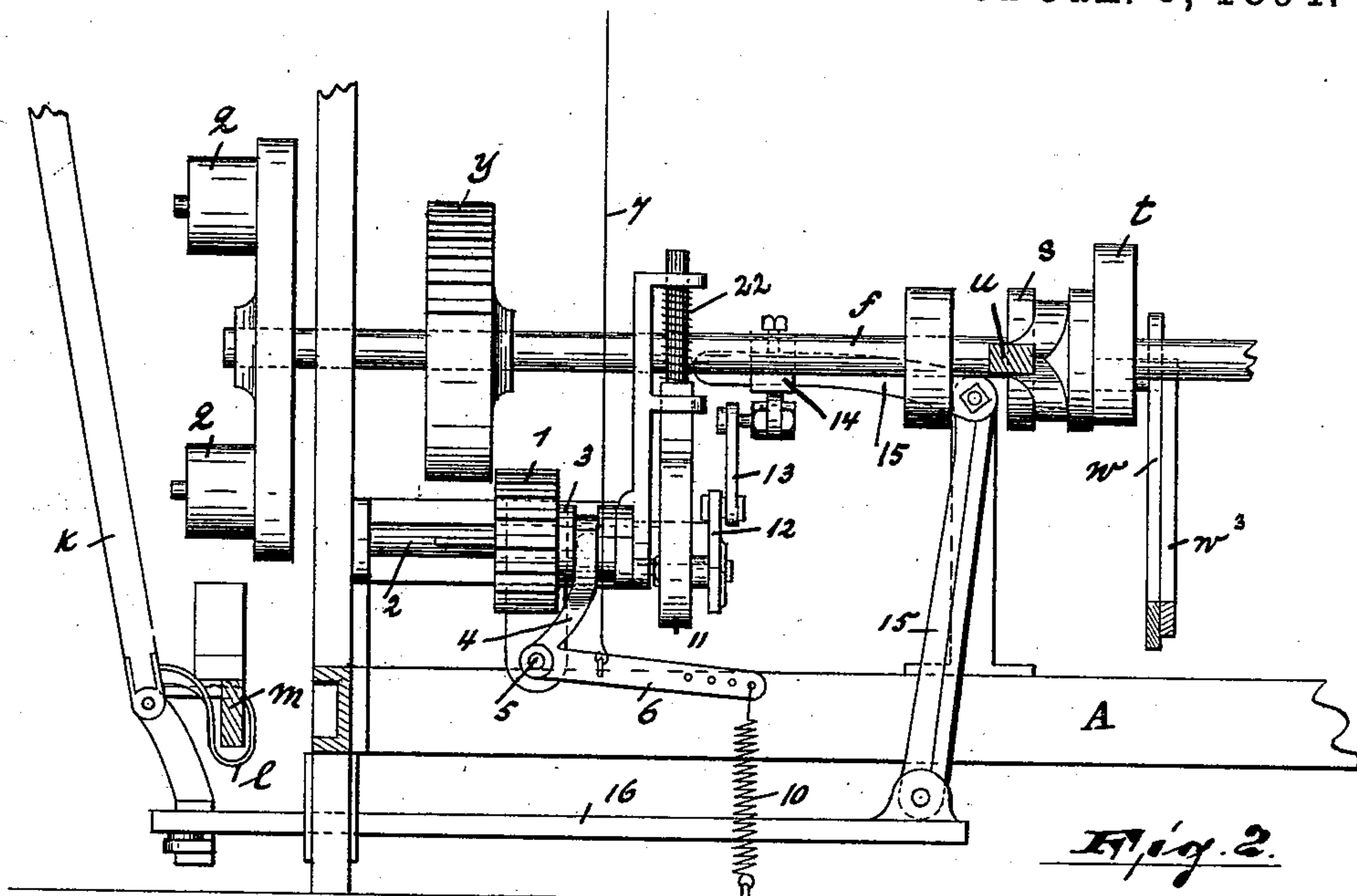
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WITNESSES:

Fig. 3.

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4 Sheets—Sheet 3.

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WITNESSES:

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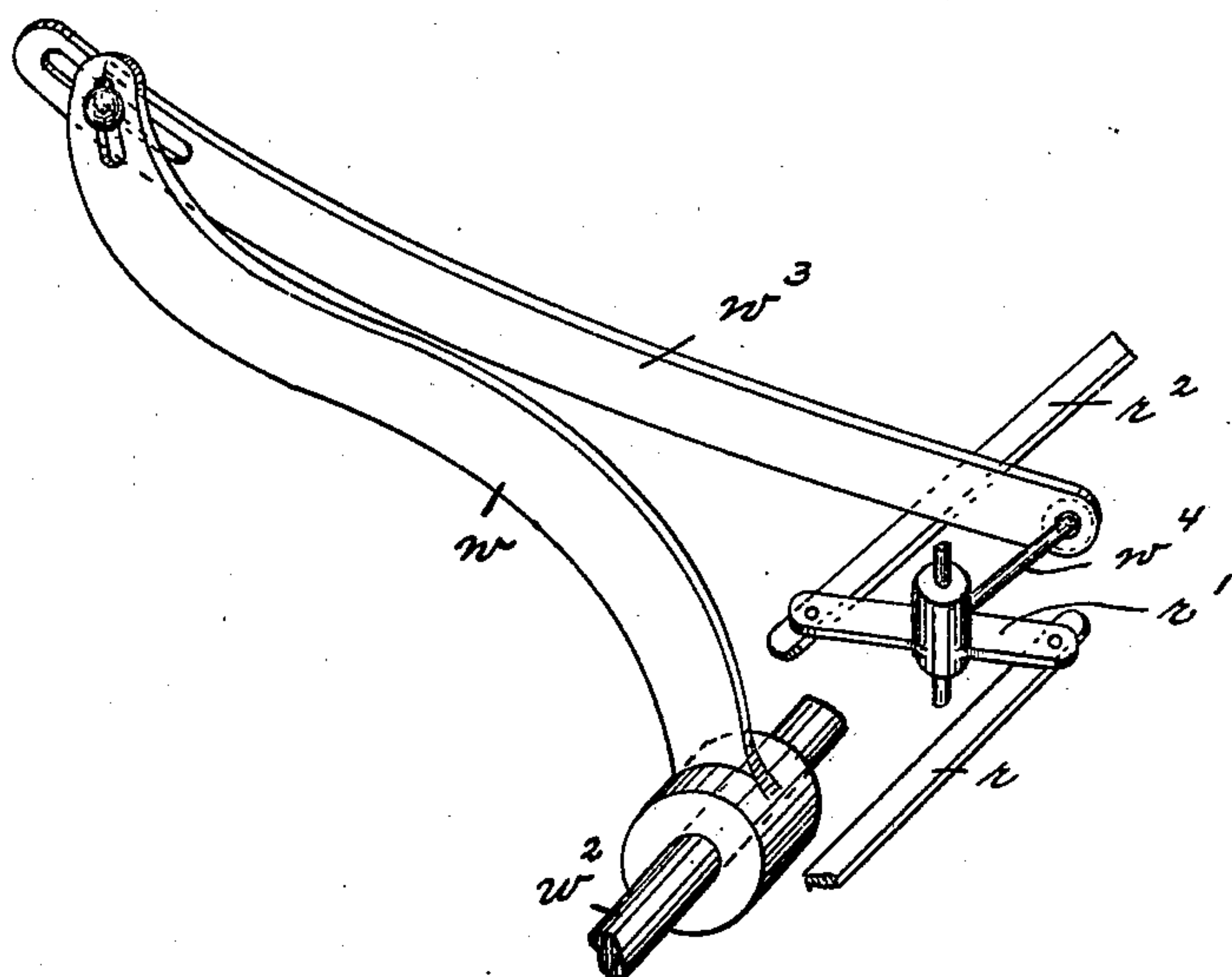


Fig. 6.

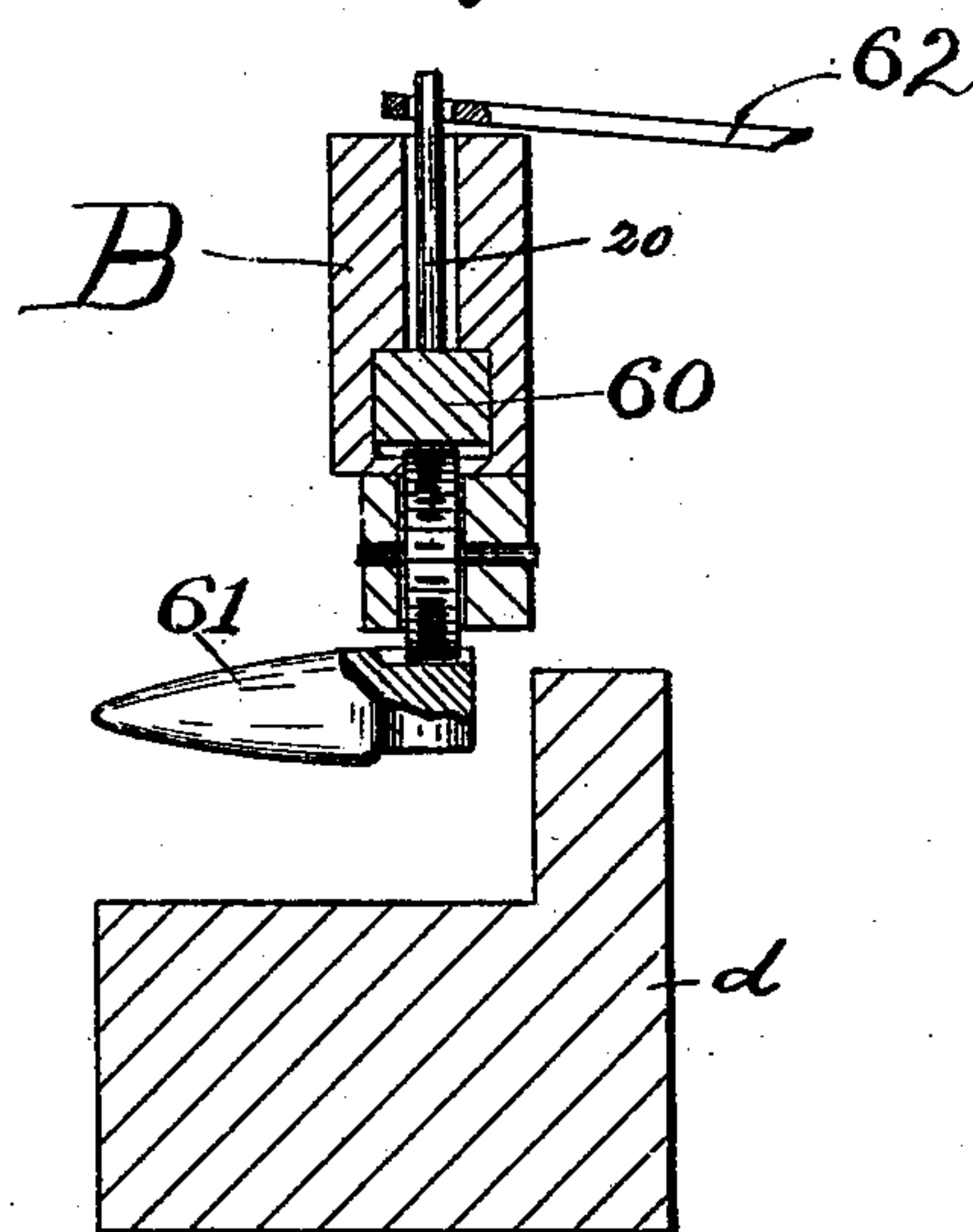


Fig. 7.

WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN T. KENNEDY, OF PATERSON, NEW JERSEY.

SWIVEL-LOOM.

SPECIFICATION forming part of Letters Patent No. 512,475, dated January 9, 1894.

Application filed February 25, 1893. Serial No. 463,756. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. KENNEDY, a citizen of the United States, residing at Paterson, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Swivel-Looms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to a new and useful improvement in swivel looms and it consists of the arrangement and combination of parts, whereby the operation of both plain and swivel weaving is accomplished in the same loom, the fly shuttle being restricted in its movement at required intervals and the swivel shuttles introduced to weave the required figure in the fabric.

It consists also in the arrangement and combination of parts hereinafter specified and claimed.

In the drawings Figure 1 is an end elevation of a swivel loom having attached to the usual well known parts my present invention. Fig. 2 is a vertical section taken on the line $x-x$ of Fig. 1, only those parts of the loom being shown as are necessary to illustrate the invention. Fig. 3 is a rear view on a smaller scale of the loom (certain portions being removed). Fig. 4 is a cross section of part of the loom taken on the line $y-y$ of Fig. 1. Fig. 5 is an enlarged detail view of the mechanism for bringing the swivel shuttles into operation. Fig. 6 is an enlarged detail perspective view of certain levers connecting the picker shoes to the rocking shaft, and Fig. 7 is an enlarged cross-sectional view taken through the swivel shuttle beam.

In said drawings A represents the frame work of an ordinary swivel loom, having the usual driving shaft a , operating through crank b' and pitman c the lay d (supported on the lay swords e) in the usual manner.

The cam shaft f , warp and cloth beams g , h and i are all of the usual description.

Power is conveyed to the loom in the usual way.

The picker sticks k are actuated by the picker stick levers m in the usual well known manner there being a flexible connection l between the end of the lever and of the picker stick. The picker stick levers m are pivoted near one end, as at n , to the loom frame so that they may be elevated or depressed by the picker balls or tappets q to actuate the picker sticks. Each of the picker stick levers m is provided with a cam piece or shoe o which is beveled upward toward the center as at p and said shoes o are each formed on the front end of a bar which is pivotally secured as at o' to the top of the respective picker stick lever. The rear ends p' of the bars, carrying the shoes o , are connected by two rods r and r^2 with the opposite ends of a toggle lever r' pivoted in a bracket r^3 on the frame of the loom.

On the cam shaft f is splined a cam t fixed to a sliding sleeve s in such a manner that the sleeve and cam rotate with the shaft f and can slide longitudinally of the same. The sleeve s is provided with a circumferential groove into which the prongs of a fork u pass. The fork u is pivoted as at u' to the bracket on the loom frame and is operated through a cord u^3 secured to its free end u^2 , which cord u^3 is operated by the angle lever u^4 pivoted in the loom frame. The angle lever is operated by cord u^5 , angle lever u^6 , cord u^7 , pawl u^8 and pattern wheel u^9 . A spring v secured to the rear end u^2 of the fork and to the loom frame serves to return the fork u to its normal position when the cord u^3 is released.

The rocking shaft w^2 at the rear part of the loom is provided with an upwardly projecting arm w on the upper end of which the cam t can act. Extending downward from the upper end of said arm and slotted thereto to form a means of adjustment therewith is an arm w^3 connected at its other end by pin w^4 to the toggle lever r' in such a manner that

when the arm w is elevated or depressed, the arm w^3 is actuated and serves to turn the toggle lever r' in its bracket and thus, through the rods r and r^2 , swings the shoes o on their pivots o' .

At either end of the cam-shaft f are secured the picker tappets q which serve to elevate and depress the picker-stick levers m by striking against the shoes o .

The swivel shuttle beam B is connected by spring controlled rods w^6 guided on the lay to treadles w^5 secured to the rocking shaft w^2 , so that when the treadles w^5 are depressed the swivel shuttle beam is depressed against the action of the springs w^7 of the rods w^6 . The swivel shuttle actuating rack 60 that operates the swivel shuttles 61 in the swivel shuttle beam B in the usual manner is connected through its driver 20 and a link 62 with the crank arm 19 of a rocking shaft 18. This rocking shaft 18 is disposed vertically in suitable bearings on one side of the frame of the loom.

Directly beneath the cam shaft f is placed, in suitable bearings in a bracket of the loom frame, a shaft 2 on which is splined a sleeve 3, carrying a pinion 1. The sleeve and pinion turn with the shaft 2, but can be moved longitudinally thereon. The sleeve 3 has a circumferential groove into which the prongs of a fork 4 pass. The fork 4 is pivoted as at 5 to a bracket of the loom frame and has an extending arm 6, held downward normally under the influence of a spring 10. The fork is operated to slide the sleeve 3, and pinion 1 on their shaft 2, by a cord 7, connected to an angle lever 8 pivoted in the loom frame adjacent the angle lever w^6 . The angle lever 8 is operated by cord 9 attached to a pawl operated by the pattern wheel w^9 .

On the cam shaft f above the shaft 2 and to one side of the normal position of the pinion 1 is keyed a mutilated gear or cog wheel y the tooth section of which is adapted when the pinion 1 is slid on its shaft 2 to engage with the pinion and thus turn the shaft 2. The cog wheel y has teeth on only one-half its surface and when in engagement with the pinion 1, turns the same one-half a revolution for one-half a revolution of the cam-shaft f , the pinion remaining at rest for the succeeding half revolution of the cam shaft.

Secured to the shaft 2 is a stop disk 11, having on its periphery two diametrically opposite flattened portions. A crank pin 63 is fixed to this disk 11. The slotted end of a lever 12, pivoted centrally to a bracket on the frame, is connected at its other end to a link 13, which in turn is pivotally secured to a block 14 secured adjustably to one arm of an angle lever 15 pivoted on a bracket of the loom-frame. The other arm of the angle lever 15 is pivotally secured to a link 16, connecting said angle lever with the crank arm 17 of the rocking shaft 18.

Resting on the edge of the disk 11 is a brake 21 held in contact with said disk by a spring

22. (See Fig. 5.) This brake serves to check the revolution of the disk 11 and shaft 2 when it rests on one of the flattened portions of the disk.

The operation is as follows:—When the swivel shuttles are required the pattern wheels are rotated by the Jacquard mechanism and through the intermediate connections the forks u and 4 are both operated simultaneously. The fork u throws the cam t over on the shaft f until said cam is above the arm w of the rocking shaft w^2 . The cam t in its rotation will thus actuate the rocking shaft w^2 and hence lower the swivel shuttle beam as heretofore explained. At the same time the shoes o are rendered inoperative through the arm w^3 , rods r and r^2 and toggle lever r' . The fork 4 throws the pinion 1 into engagement with the mutilated cog-wheel y and thus sets the shaft 2 in motion. The disk 11 rotating with the shaft is turned one-half a revolution and through the intermediate connections shifts the swivel shuttles from right to left or vice versa. From the drawings it will be seen how in my present loom all of these motions co-operate with the motion of the fly-shuttle in weaving the ground pick of the fabric. For instance when the gear wheel y is meshing with the pinion 1 the cam t is depressing the arm w of the rocking shaft w^2 and is thus lowering the swivel shuttles; at the same time the shoes o are thrown out of engagement with the tappets q . In other words when the fly shuttle is at rest the swivel shuttle beam is lowered and the swivel shuttles actuated.

We will follow the motion of the loom when the swivel shuttles are required. The shoes o are thrown out of alignment with the picker tappets z and hence no pick of the fly shuttle takes place. At the same time the cam t depresses through the arm w and rocking shaft w^2 the swivel shuttle beam to bring the swivel shuttles in position for weaving and when so lowered, the swivel shuttles are thrown from right to left or left to right as the case may be to make one pick of swivel weaving. The beam is then raised by the action of the springs w^7 , this being permitted by the rotation of the cam t , the shoes o swung back into their normal position and the swivel rack actuating mechanism brought to a stand still by virtue of the fact that the plane surface of the cog-wheel y has passed over the teeth of the pinion 1. One pick of the fly shuttle then takes place and the cam t in its rotation immediately thereafter actuates the shoes o and swivel shuttle beam as before described and the teeth of the cog-wheel y again mesh with the pinion 1 to operate through the intermediate connections the swivel shuttles from left to right or right to left to make a second swivel pick. The succession of alternate fly shuttle and swivel shuttle picks continues until the Jacquard mechanism indicates by releasing the forks u and 4 that no further swivel weaving is required. When

the forks *u* and 4 are released they assume their normal position under the influence of their respective springs and the cam *t* and pinion 1 are returned to their normal position on their respective shafts.

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

1. In a loom, the combination of a swivel shuttle beam and actuating rack, a driver for said rack, a vertical rocking shaft and crank arm adapted to operate said driver, with a shaft, a pinion and grooved sleeve splined to said shaft, a disk having a crank pin secured to said shaft and rotated thereby, a slotted lever pivoted eccentrically to said disk by means of said pin, an angle lever pivoted in the frame of the loom, a link connecting one end of said angle lever to the slotted lever, a link and crank arm connecting the other end of said angle lever to the vertical rocking shaft, a fork pivoted in the loom frame and adapted to be operated by a Jacquard cord to slide the pinion on its shaft, and with a cam shaft, a mutilated gear wheel keyed thereto and adapted to intermittently rotate said pinion and its disk, when said pinion is slid on its shaft into engagement therewith and to thereby, through the intermediate connection, operate the swivel shuttle actuating rack, substantially as described.

2. In a loom, the combination of a swivel shuttle beam and actuating rack, a driver for said rack, a vertical rocking shaft and its crank arm adapted to operate said driver, with a shaft, a pinion and grooved sleeve splined to said shaft, a disk having a crank pin secured to said shaft and rotating therewith, a spring controlled brake resting on the periphery of said disk and adapted to stop the rotation of the same, a slotted lever pivoted eccentrically to said disk by means of said pin, an angle lever pivoted in the frame of the loom, a link connecting one end of said angle lever to said slotted lever, a link and crank arm connecting the other end of said angle lever to the vertical rocking shaft, a fork pivoted in the loom frame and adapted to be operated by a Jacquard cord to slide the pinion on its shaft, and with a cam shaft, a mutilated gear wheel keyed thereto and adapted to intermittently rotate said pinion and its disk when said pinion is slid on its shaft into engagement therewith, and to thereby, through the intermediate connection, operate the swivel shuttle actuating rack, substantially as described.

3. In a loom, the combination of a swivel shuttle beam and actuating rack, a driver for said rack, a vertical rocking shaft and its crank arm adapted to operate said driver, a shaft, a pinion and its grooved sleeve splined to said shaft, a disk having a crank pin secured to and rotating with said shaft, a slotted lever pivoted eccentrically to said disk by means of said pin, an angle lever pivoted in the loom frame, a link connecting one end of

said angle lever with said slotted lever, a link and crank arm connecting the other end of said angle lever to the vertical rocking shaft, a fork pivoted in the loom frame and adapted to be operated by a Jacquard cord to slide the pinion on its shaft, with a cam shaft, a mutilated gear wheel keyed thereto and adapted to intermittently rotate said pinion and its disk, when said pinion is slid on its shaft into engagement therewith and to thereby, through the intermediate connection, operate the swivel shuttle actuating rack, and with a cam and its grooved sleeve splined to said cam shaft, a fork pivoted in the frame of the loom and adapted to be operated by another Jacquard cord to slide said cam on its shaft, a horizontal rocking shaft, treadles *w*⁵ secured thereto, spring controlled rods connecting the swivel shuttle beam with said treadles, a projecting arm *w* on said horizontal rocking shaft extending beneath the cam shaft and arranged so that when said cam on said cam shaft is slid thereon, said projecting arm will be depressed thereby and thus through the horizontal rocking shaft and intermediate connections will lower the swivel shuttle beam, substantially as described.

4. In a loom, the combination of a swivel shuttle beam and actuating rack, a driver for said rack, a vertical rocking shaft and its crank arm adapted to operate said driver, a shaft, a pinion and its grooved sleeve splined to said shaft, a disk having a crank pin and secured to and rotating with said shaft, a slotted lever pivoted eccentrically to said disk by means of said pin, an angle lever pivoted in the loom frame, a link connecting one end of said angle lever with said slotted lever, a link and crank arm connecting the other end of said angle lever to the vertical rocking shaft, a fork pivoted in the loom frame and adapted to be operated by a Jacquard cord to slide the pinion on its shaft, with a cam shaft, a mutilated gear wheel secured thereto and adapted to intermittently rotate said pinion and its disk, when said pinion is slid on its shaft into engagement therewith and to thereby, through the intermediate connection, operate the swivel shuttle actuating rack, and with a cam and its grooved sleeve splined to said cam shaft, a fork pivoted in the frame of the loom and adapted to be operated by another Jacquard cord to slide said cam on its shaft, a horizontal rocking shaft, treadles *w*⁵ secured thereto, spring controlled rods connecting the swivel shuttle beam with said treadles, a projecting arm *w* on said horizontal rocking shaft extending beneath the cam shaft and arranged so that when said cam on said cam shaft is slid thereon, said projecting arm will be depressed thereby and thus, through the horizontal rocking shaft and intermediate connections, will lower the swivel shuttle beam, and with the picker sticks, picker stick levers flexible connections between said picker sticks and their levers, shoes pivoted on said levers, picker tappets

secured at each end of the cam shaft, a downwardly extending arm pivotally connected to the end of the projecting arm of the horizontal rocking shaft, a pin secured to the end of
5 said downwardly extending arm, a toggle lever pivoted in the loom frame and adapted to be turned by said pin, rods connecting the ends of said toggle lever to the ends of said pivoted shoes, all arranged so that when said
10 arm on the rocking shaft is depressed by the cam and the swivel shuttle beam is lowered,

the toggle lever and rods are operated by the arm connected to the arm of the rocking shaft and throw the shoes out of alignment with the picker tappets, substantially as described. 15

In testimony that I claim the foregoing I have hereunto set my hand this 17th day of February, 1893.

JOHN T. KENNEDY.

Witnesses:

HENRY E. EVERDING,
FRANK E. GALLANT.