

W. J. GARLICK.

LOOM.

APPLICATION FILED JULY 6, 1907.

924,339.

Patented June 8, 1909.

6 SHEETS—SHEET 1.

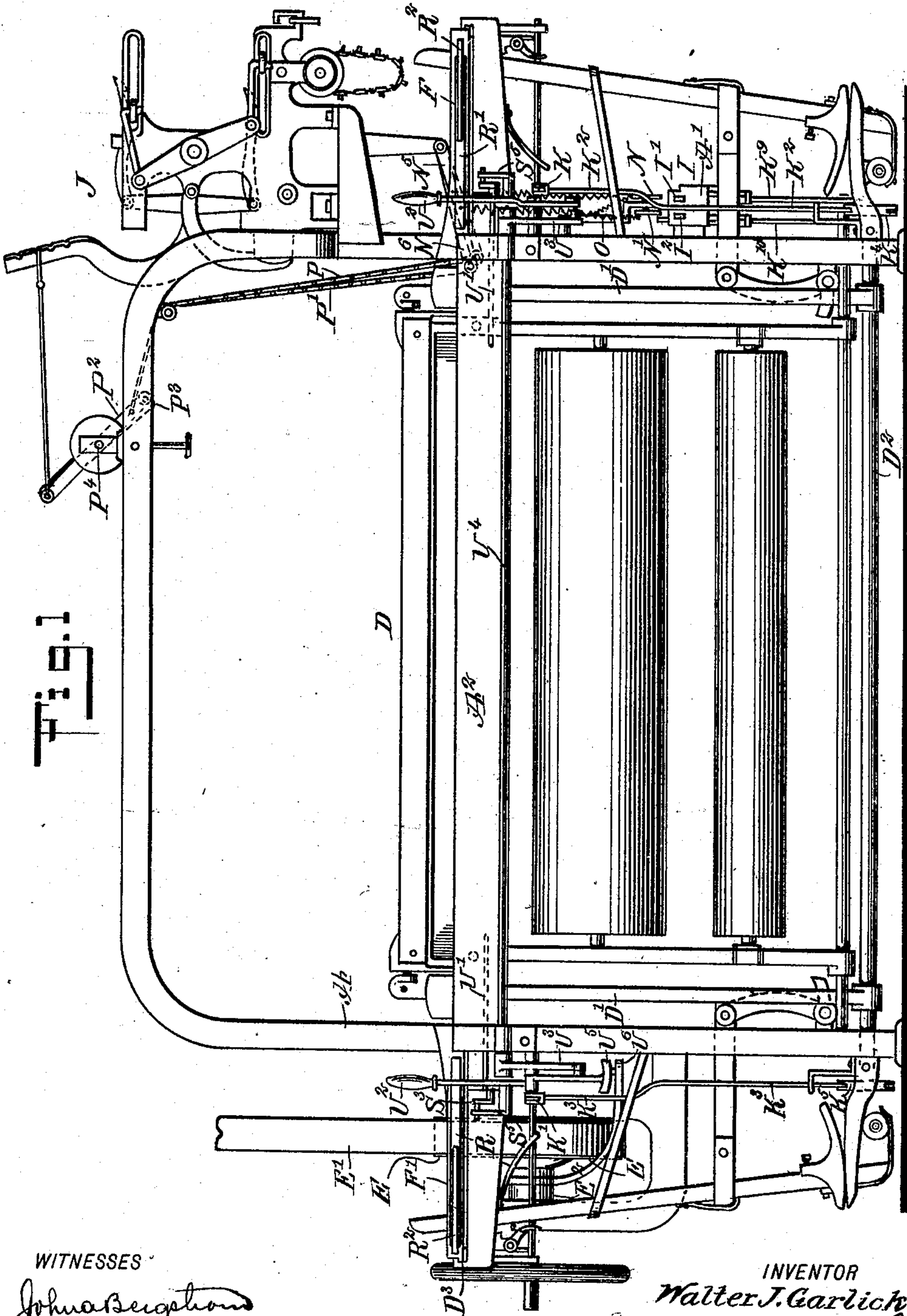


Fig. 1

WITNESSES

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5 SHEETS—SHEET 2.

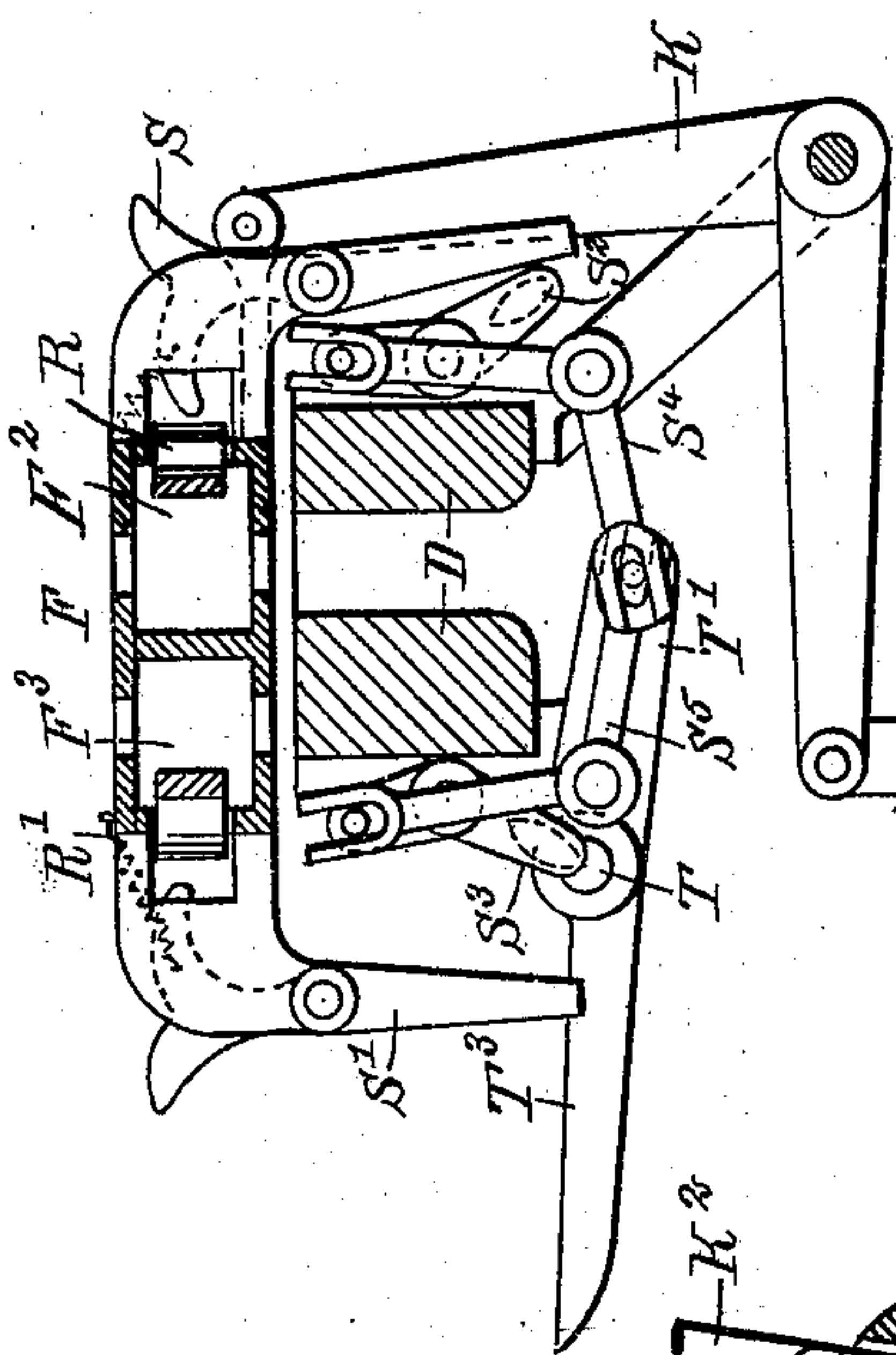
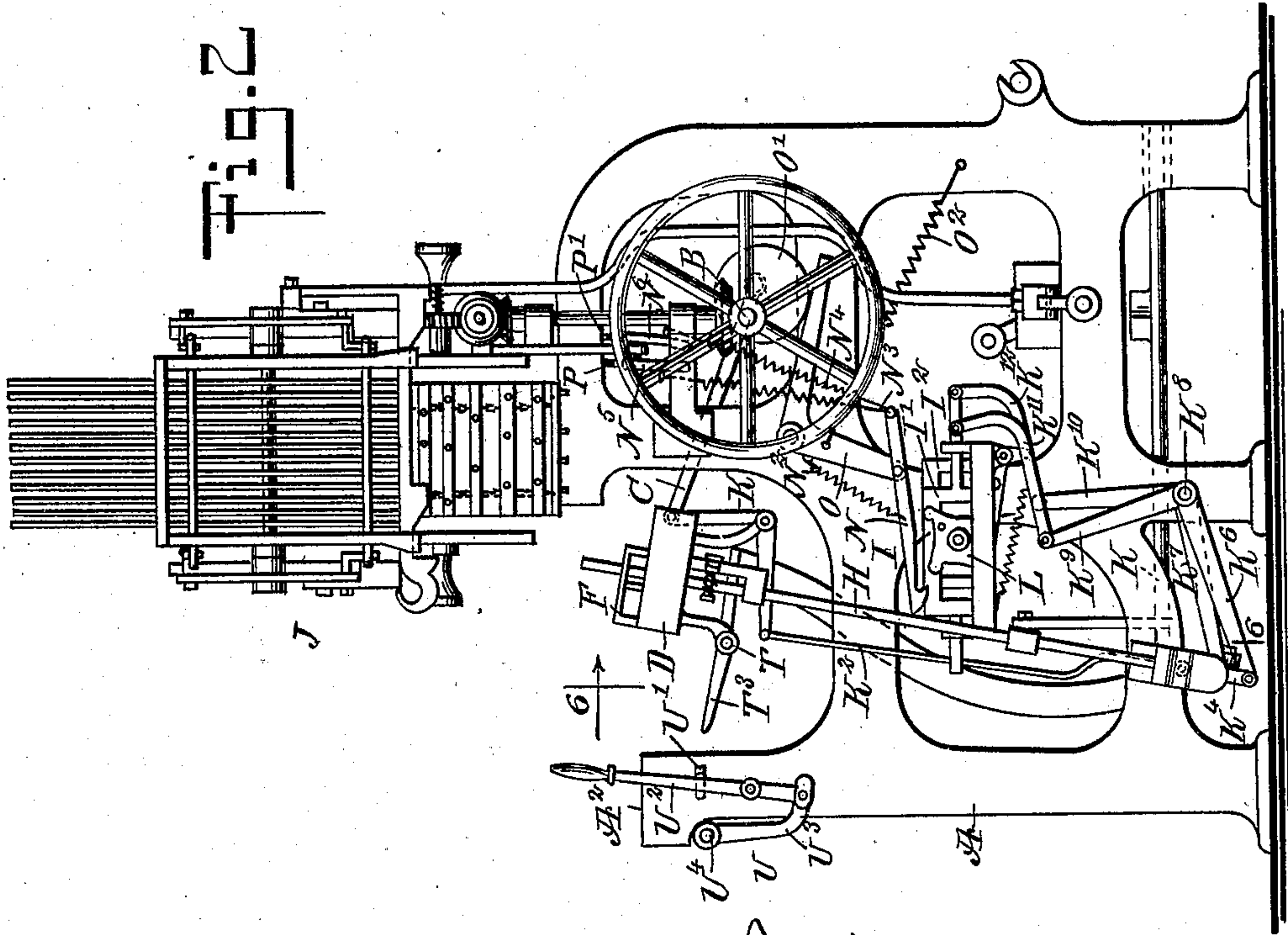


Fig. 3

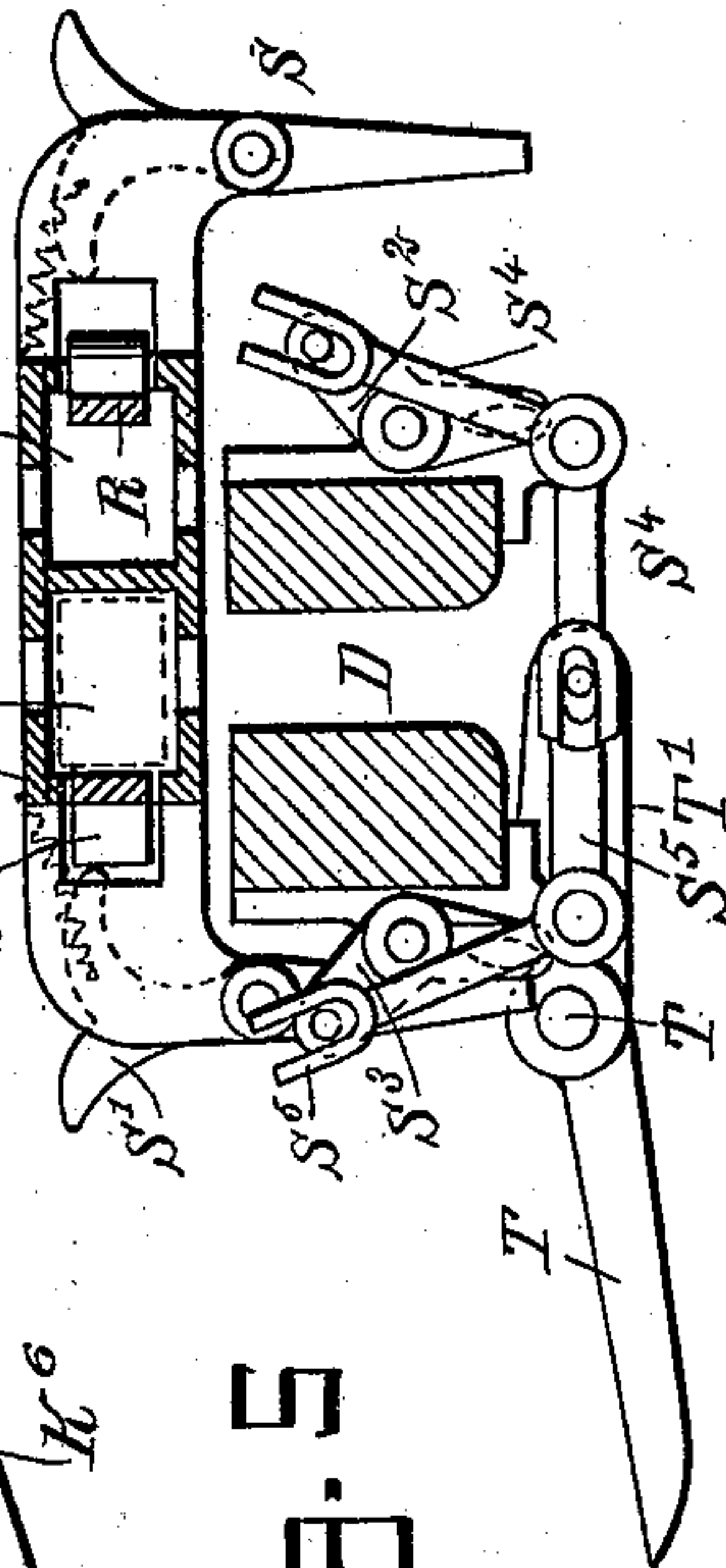


Fig. 4

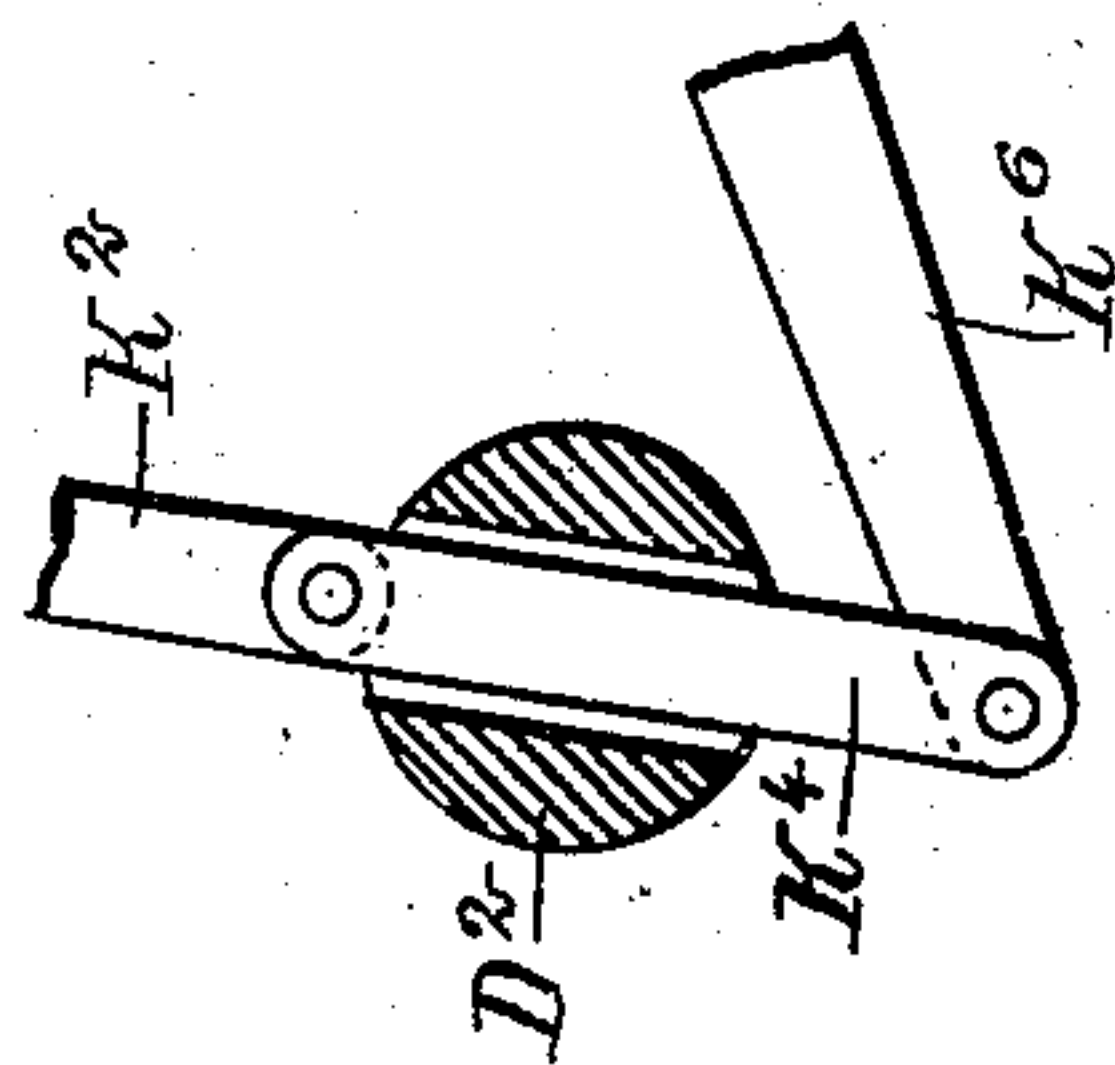


Fig. 5

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6 SHEETS—SHEET 3.



WITNESSES

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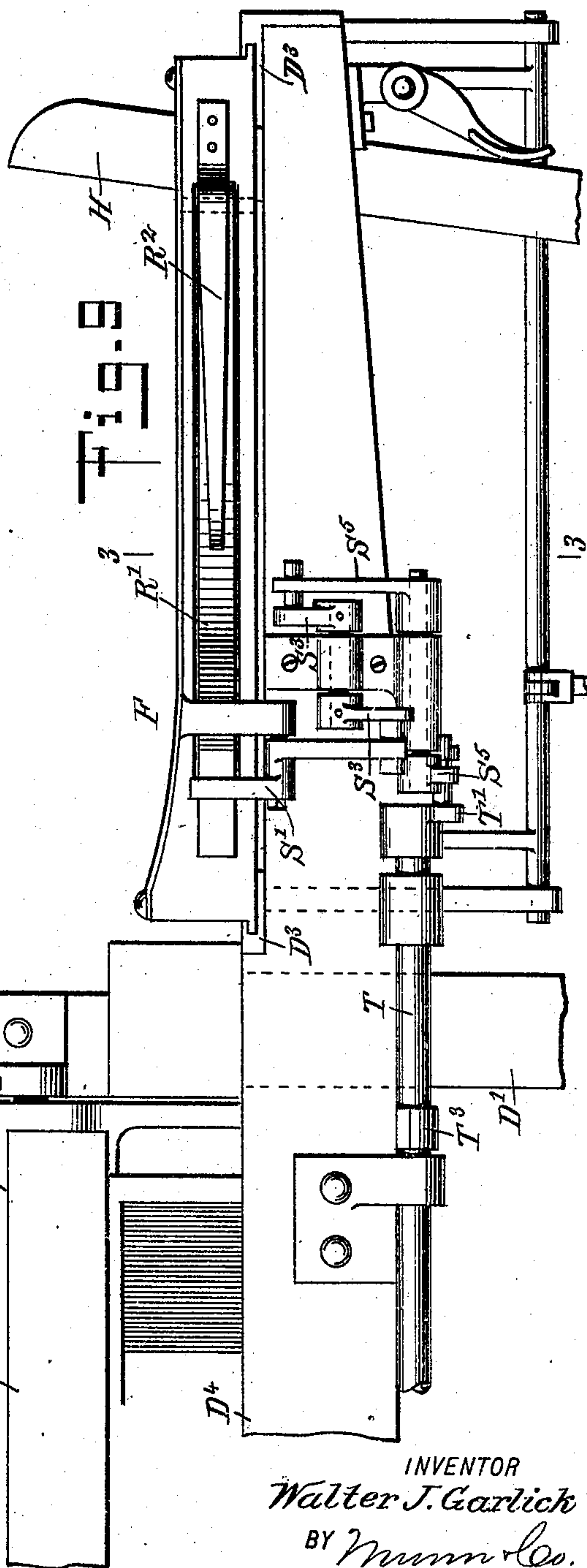
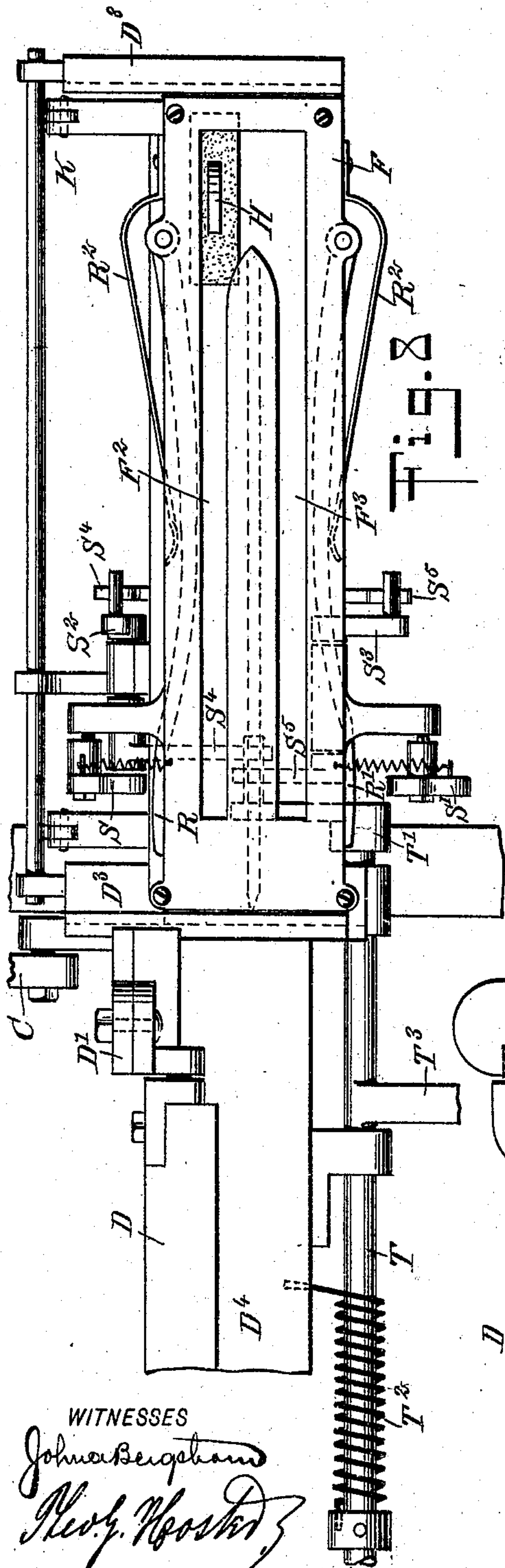
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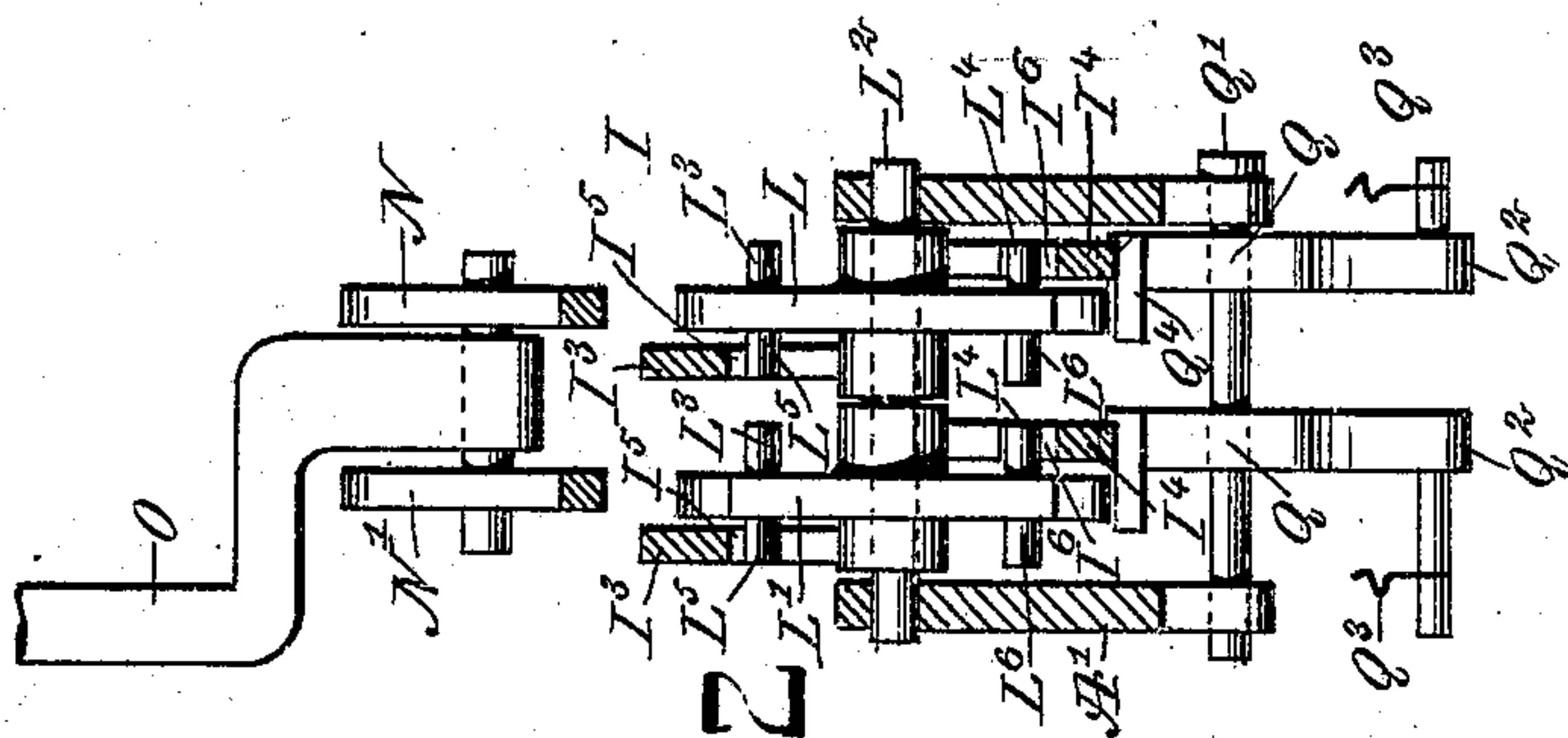
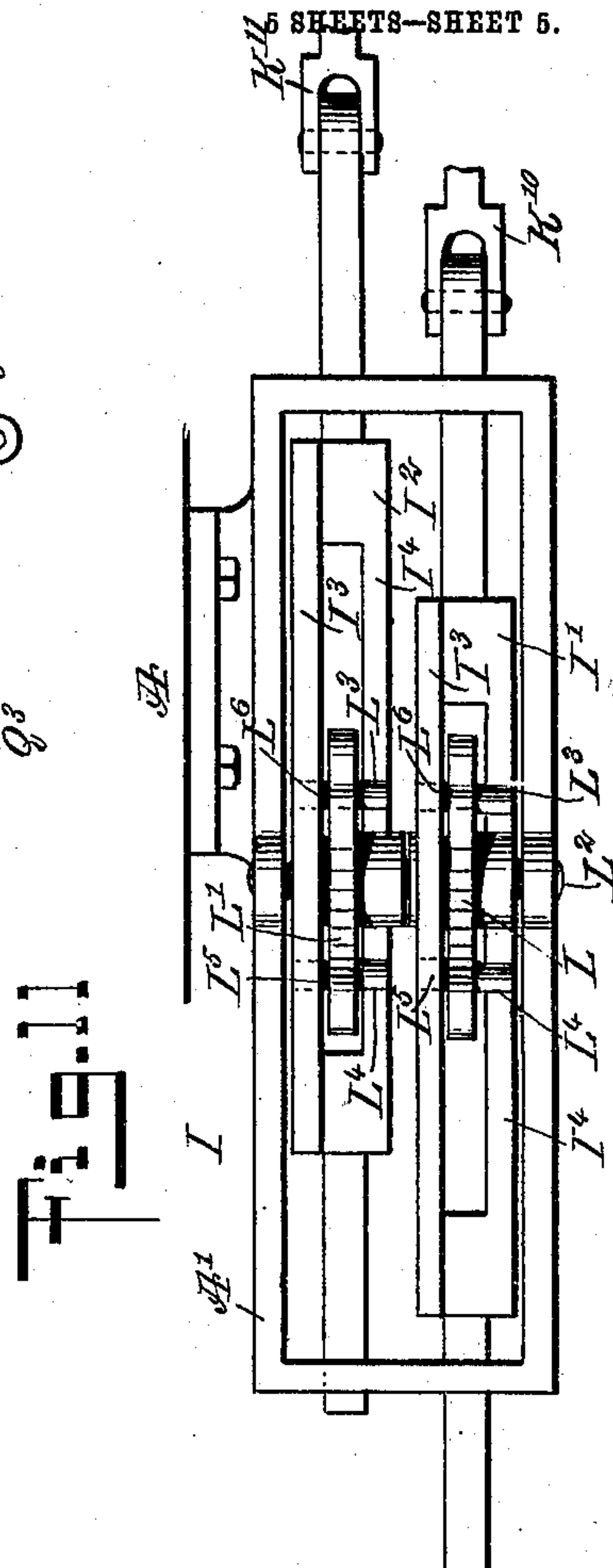
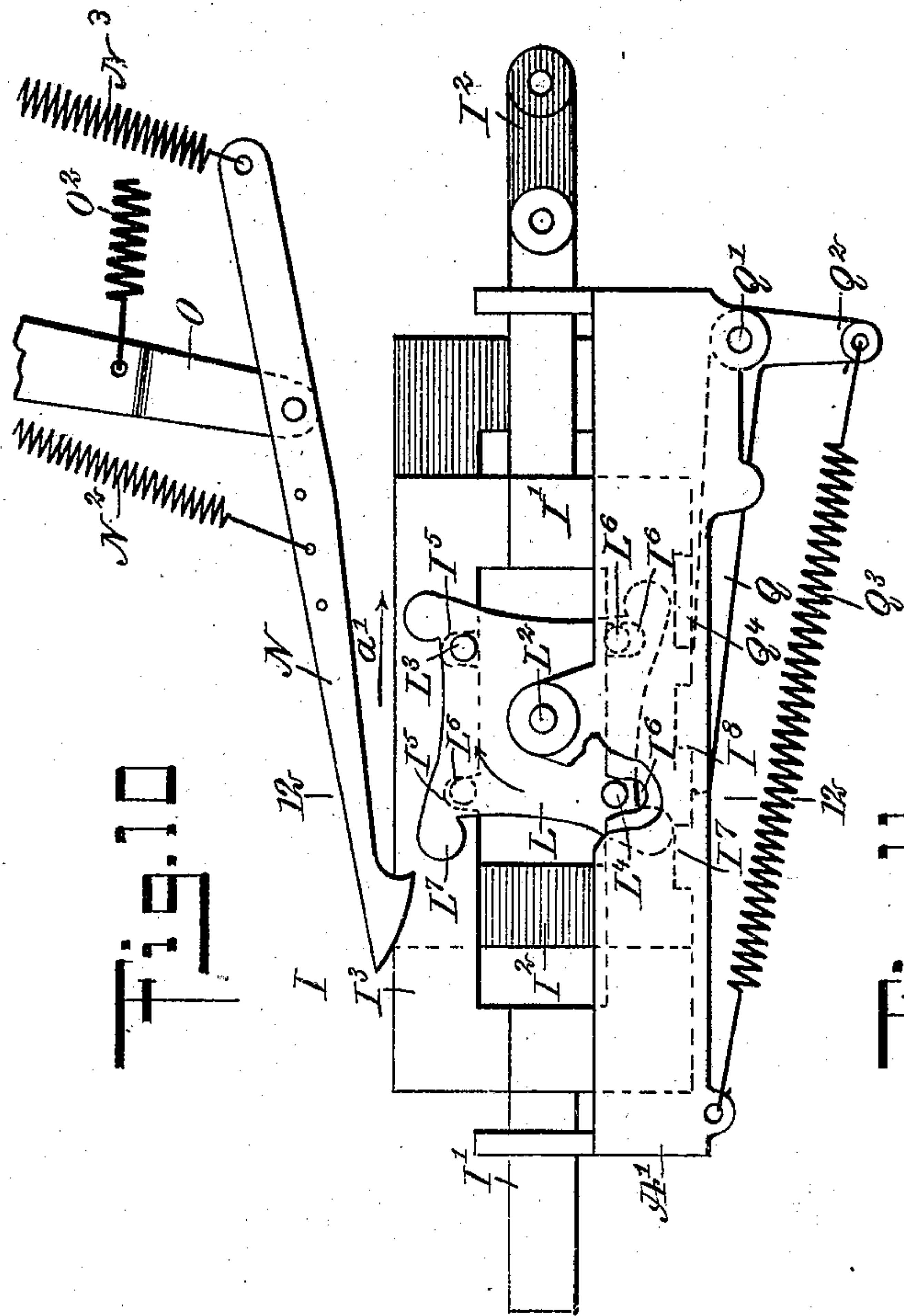
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~~11~~ 5 SHEETS--SHEET 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

WALTER J. GARLICK, OF PATERSON, NEW JERSEY, ASSIGNOR TO JOSEPH FORTINSKY, OF PATERSON, NEW JERSEY, AND MAX SCHLESINGER, OF NEW YORK, N. Y.

LOOM.

No. 924,339.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed July 6, 1907. Serial No. 382,513.

To all whom it may concern:

Be it known that I, WALTER J. GARLICK, a citizen of the United States, and a resident of Paterson, in the county of Passaic and State of New Jersey, have invented a new and Improved Loom, of which the following is a full, clear, and exact description.

The invention relates to box looms and its object is to provide a new and improved loom having a plurality of shuttles carrying different colored threads, and arranged to permit moving any one of the shuttles into active position and working it for one or any desired number of picks according to a predetermined design.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a front elevation of the improvement; Fig. 2 is a side elevation of the same; Fig. 3 is an enlarged sectional side elevation of the improvement on the line 3—3 of Fig. 9, and showing more particularly a shuttle box, means for shifting the same, and part of the stop motion; Fig. 4 is a like view of the same showing the parts in a different position; Fig. 5 is an enlarged sectional elevation of the lay shaft and part of the shuttle box shifting mechanism; Fig. 6 is a cross section of the loom on the line 6—6 of Fig. 2; Fig. 7 is a sectional plan view of the shuttle boxes on the ends of the lay; Fig. 8 is an enlarged plan view of the shuttle box and the operating mechanism for the same on the right hand side of the lay; Fig. 9 is a front elevation of the same; Fig. 10 is an enlarged side elevation of the shifting mechanism for the shuttle boxes; Fig. 11 is a plan view of the same, and Fig. 12 is a cross section of the same on the line 12—12 of Fig. 10.

On the main frame A of the loom is mounted the usual crank shaft B connected by pitmen C with a lay D, and on the said crank shaft B is mounted to rotate loosely a pulley E connected by a belt E' with other machinery for imparting a continuous rotary motion to the pulley E, the motion of which is transmitted to the crank shaft B by the usual clutch mechanism E² under the control

of the operator and also automatically controlled by the stop motion to stop the loom in case of accident, as hereinafter more fully explained.

The swords D' of the lay D are attached to the lay shaft D² journaled in the main frame A, and on the ends of the lay D are arranged longitudinally extending bearings D³ on which are mounted to slide the shuttle boxes F and F', each having a plurality of compartments or pockets; for instance, as shown in the drawings, the shuttle box F is provided with compartments F², F³, and the shuttle box F' with compartments F⁴, F⁵. When the loom is constructed with the shuttle boxes F, F', having each two compartments or pockets, as shown and described, then three shuttles G, G', G² are employed, the shuttles carrying bobbins provided with different colored threads, and the shuttles are adapted to travel from one shuttle box to the other over the usual shuttle race D⁴, mounted on the lay D, the shuttles being actuated by the usual picker sticks H, H'. Now by the arrangement described one of the compartments in a shuttle box is emptied and is in register at the time with the shuttle race D⁴, and a shuttle in the other shuttle box is in register with the shuttle race D⁴, to permit of sending the shuttle over the race-way into the empty compartment. Thus, as illustrated for instance in Fig. 7, the compartment F⁴ is empty and in transverse alignment with the shuttle race D⁴, and the shuttle G in the compartment F² is in alignment with the shuttle race and consequently through the open shed into the empty compartment F⁴. Now according to the predetermined design, the shuttle G in the compartment F⁴ may be returned at the next pick, but if the pattern of the fabric should require another color for the next pick, then the shuttle box F' is shifted laterally, so as to bring the compartment F⁵ and the shuttle G² in register with the race-way D⁴ and with the picker stick H', to allow the latter to send the shuttle G² over into the empty compartment F². Now this shuttle G² may be returned back to the compartment F⁵ if a pattern calls for it, but, if not, this shuttle G² may be kept in the compartment F² and the shuttle box F shifted laterally, so as to bring

the compartment F^3 and the shuttle G' in register with the shuttle race D^4 and the picker stick H , to allow the latter to send the shuttle G' over the race-way D^4 and through the open shed into the empty compartment F^5 . Thus from the foregoing it will be seen that any one of the shuttles can be passed to the other side during one pick and another shuttle returned in the next following pick, or any one of the shuttles can be sent forward and backward as many times as desired and called for by the pattern.

By reference to Figs. 7 and 8, it will be seen that the outer ends of the compartments F^2, F^3 in the shuttle box F , and the compartments F^4, F^5 in the shuttle box F' are connected with each other, that is, the outer ends of the shuttle boxes are open, to allow shifting of the shuttle boxes in a lateral direction, to bring the corresponding compartments in register with the picker sticks H, H' and the shuttle race D^4 . In order to impart the desired sliding motion to the shuttle boxes F and F' , the following shifting mechanism I is provided and controlled by a dobby or a jacquard J of any approved construction: The rear sides of the shuttle boxes F, F' are pivotally connected with bell crank levers K, K' fulcrumed on the lay D and pivotally connected with downward extending links K^2, K^3 connected at their lower ends with links K^4, K^5 mounted to slide in recesses in the lay shaft D^2 , as illustrated in Fig. 5. The lower ends of the links K^4, K^5 are pivotally connected with arms K^6, K^7 , of which the arm K^7 is secured on a transversely extending shaft K^8 journaled in suitable bearings on the main frame A . The arm K^6 is fulcrumed loosely on the shaft K^8 and is provided with an upwardly extending arm K^9 , and a similar arm K^{10} is secured on the shaft K^8 adjacent to the arm K^9 . The arms K^9 and K^{10} are connected by links K^{11}, K^{12} with the cross heads I', I^2 of the shifting mechanism I , the cross heads I', I^2 being mounted to slide longitudinally in suitable bearings arranged on a bracket A' attached to the main frame A at the right hand side of the machine. The cross heads I', I^2 receive a longitudinal intermittent sliding movement by the use of wheels L, L' mounted to rotate loosely on a shaft L^2 held on the bracket A' , and the said wheels L, L' are adapted to be turned intermittently and independently one of the other by hook levers N, N' , both fulcrumed on a bell crank lever O fulcrumed on the main frame A and engaged by a cam O' secured on the crank shaft B , the said bell crank lever O being held in engagement with the peripheral surface of the cam O' by a spring O^2 , as plainly illustrated in Fig. 2. The hook levers N and N' are normally held out of engagement with the wheels L, L' by springs N^2 which connect the hook arms N with the bell crank lever O , and the rear ends of the

hook levers N and N' are connected by springs N^3, N^4 with arms N^5, N^6 fulcrumed on the main frame A and connected by chains P, P' with arms P^2, P^3 mounted to turn on a shaft P^4 and connected in the usual manner with the dobby J , so that the chains P and P' are pulled upward according to the pattern called for by the dobby J . Now when a chain P or P' is pulled upwardly then a like upward swinging motion is given to the corresponding arm N^5 or N^6 , which by the spring N^3 or N^4 imparts a swinging motion to the hook lever N or N' , so as to swing the same with its hook end into engagement with the corresponding wheel L or L' , to give the latter a quarter turn. Now when this takes place a corresponding sliding motion either in a forward or a backward direction is given to the cross head I' or I^2 , which by the action above described shifts the shuttle box F or F' to bring the desired compartment into alinement with the shuttle race D^4 on the lay D .

The shifting device I is constructed in detail as follows: Each of the wheels L, L' is provided on one face with diagonally disposed pins L^3, L^4 and on the opposite face with correspondingly disposed pins L^5, L^6 , and each of the cross heads I', I^2 is provided with a longitudinally extending top bar I^3 and a bottom bar I^4 , having notches I^5, I^6 for engagement by the pins L^5, L^6 and L^3 and L^4 , respectively. Each of the wheels L, L' is provided at the corners with projections L^7 adapted to be engaged by the hook end of the corresponding hook lever N or N' for giving a quarter turn to the corresponding wheel L or L' . Now when the several parts are in the position illustrated in Fig. 10 and the hook lever N is caused to swing downward by the action of the dobby J and a continuous bodily reciprocating movement is given to the said hook lever N by the action of the bell crank lever O and the cam wheel O' , then the hook end of the hook lever N in engaging the forward projection L^7 of the wheel L turns the latter, on the rearward reciprocating movement of the hook lever N , so that a quarter turn is given to the wheel L . Now as the pin L^5 of the wheel L is in engagement with the corresponding notch I^5 of the upper bar I^3 of the cross head I' , it is evident that on the turning motion of the wheel L , a rearward sliding movement is given to the cross head I' in the direction of the arrow a' . During this turning movement of the wheel L the pin L^4 in engagement with the notch I^6 in the bottom bar I^4 moves out of the notch, to allow a free, sliding movement in a rearward direction of the cross head I' . When the hook lever N reaches the end of the stroke then the pull on the hook lever N by the dobby is released, so that the spring N^2 returns the hook lever N to its normal position, and consequently when the hook lever N

moves bodily forward by the action of the bell crank lever O and the cam O', it is evident that the wheel L remains at a standstill. Now, presuming that the above-described operation is repeated, that is, another quarter turn is given to the wheel L by the hook lever N in the manner described, then the pin L³ of the wheel L on account of having previously moved in engagement with the notch I⁶ in the bottom bar I⁴ of the cross head I', shifts the latter in the inverse direction of the arrow α', that is, back to the position shown in Fig. 10. Thus from the foregoing it will be seen that by the hook lever N the cross head I' is reciprocated intermittently, and in a like manner the cross head I² is intermittently reciprocated by its hook lever N'.

In order to lock either of the cross heads I', I² in the end positions, a catch Q is provided, adapted to engage notches I⁷, I⁸, formed in the under side of the bottom bars I⁴ of the cross heads I' and I². The catch Q is fulcrumed at Q' on the bracket A', and is provided with a downwardly extending arm Q² pressed on by a spring Q³, to hold the catch Q in engagement with either of the notches I⁷ or I⁸, to lock the corresponding cross head I' or I² in the end position. The catch Q is provided on its top with an offset Q⁴ adapted to be engaged by a rearward lower projection L⁷ of the wheel L or L', to move the catch Q out of engagement with the corresponding notch I⁷, I⁸ immediately previous to giving a reciprocating motion to the cross head I' or I² by the wheel L or L', as above described.

It is understood that when the cross head I' or I² is shifted, a corresponding shifting motion is given to the shuttle box F or F' for the purpose previously mentioned.

The stop motion for shifting the clutch mechanism E² out of gear is of the usual construction, and is actuated from whatever shuttle compartment and corresponding shuttle may be in active position at the time. The actuating mechanisms for the stop motion are alike for both shuttle boxes F, F' and hence it suffices to describe but one in detail, special reference being had to Figs. 3, 8 and 9, which show the actuating mechanism in connection with the shuttle box F. Into the compartments F², F³ (F⁴, F⁵) extend lengthwise the shuttle retainers R, R' in the form of arms pivoted on the shuttle box F (F') and pressed inward into the path of an incoming shuttle by springs R². The free ends of the retainers R, R' are adapted to engage spring-pressed levers S, S' fulcrumed on the shuttle box F (F') and adapted to actuate bell crank levers S², S³ fulcrumed on opposite sides of the lay D and connected with the forked upper ends of another set of bell crank levers S⁴, S⁵ likewise fulcrumed on the lay and pivotally connected with an arm T' projecting rearwardly from a shaft T extending transversely and journaled in suitable

bearings on the front of the lay D, as plainly indicated in the drawings. The shaft T is pressed on by a spring T² and is provided with forwardly extending arms T³ adapted to engage bars U' mounted to slide in the frame A of the loom below the breast beam A², as plainly indicated in Figs. 1 and 2. The bars U' are adapted to engage the hand levers U² of the stop motion U and connect with arms U³ attached to the stop motion shaft U⁴ journaled on the front of the main frame A, so as to connect the two hand levers U² on opposite sides of the main frame with each other. The hand lever U² on the left hand side of the main frame A is connected at its lower end at U⁵ with the shifting arm U⁶ for the clutch mechanism E², to move the clutch mechanism E² in and out of gear with the pulley E. The arms T³ extend normally in the path of the bars U' owing to the action of the springs T² on the shaft T, but when a shuttle passes properly into a compartment F², F³, F⁴ or F⁵ and the extending retainer R or R' is pressed outward by the incoming shuttle, then the spring-pressed lever S or S' receives a swinging motion by the said retainer R or R', and the lever S or S' imparts a swinging motion to the corresponding bell crank lever S² or S³, which in turn imparts a swinging motion to the corresponding bell crank lever S⁴ or S⁵, and as both bell crank levers S⁴ and S⁵ are connected with the arm T', it is evident that a swinging motion is given to the latter, to turn the shaft T, with a view to swing the arms T³ downward out of the path of the bars U', and hence when the lay D beats in, the arms T³ do not come in contact with the bars U', and consequently the stop motion U is not actuated. In case, however, a shuttle does not properly pass into the corresponding compartment F², F³, F⁴ and F⁵, then it necessarily does not actuate the spring-pressed retainer R or R' and the shaft T is not rocked, and consequently the arms T³ come in contact with the bars U' as soon as the lay beats in, and when this takes place the arms T³ push the bars U' outward, thus moving the hand levers U², whereby the shifting lever U⁶ is actuated and the clutch mechanism E² is thrown out of gear with the pulley E and the loom comes to a stop before serious damage can be done. From the foregoing it will be readily seen that whatever position a shuttle box F or F' takes, it is in position to actuate the stop motion in case a shuttle fails to pass from one shuttle box over the shuttle race D⁴ to the other shuttle box.

Now when the loom is running, the shuttle boxes F and F' are automatically shifted by the mechanism described, according to the predetermined design to be woven in the fabric and translated by the dobby J. It will be seen that by the arrangement described, each and every one of the shuttles can make

one, two, three, four, five or any desired number of picks, that is, it is not necessary for a shuttle to make two picks before another shuttle can take its place, but each shuttle
5 can make one or any desired number of picks.

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

10 1. A loom provided with a lay having a shuttle race, shuttle boxes mounted to slide laterally on the ends of the lay, each shuttle box having a plurality of compartments, one for each shuttle, the compartments being ar-
15 ranged one alongside the other, shifting mechanisms, one for each shuttle box and each comprising a cross head mounted to slide and means for actuating the cross head, and a dobby controlling the said shifting
20 mechanisms to actuate either of the said shifting mechanisms.

2. A loom provided with a lay having a shuttle race, a shuttle box mounted to slide laterally on the end of the lay and having a
25 plurality of compartments, one alongside the other, a shifting mechanism for the shuttle box, and having a cross head mounted to slide longitudinally, a connection between the cross head and the shuttle box, a dobby,
30 and means controlled by the said dobby for imparting an intermittent reciprocating motion to the said cross head.

3. A loom provided with a lay having a shuttle race, a shuttle box mounted to slide
35 laterally on the end of the lay and having a plurality of compartments, one alongside the other, a shifting mechanism for the shuttle box, and having a cross head mounted to slide longitudinally, a connection between
40 the cross head and the shuttle box, an intermittently rotating wheel having pins for alternately engaging recesses on the said cross head, to alternately and intermittently reciprocate the cross head, a hook lever for
45 engaging the said wheel, means continuously imparting a bodily movement to the said hook lever in a longitudinal direction, and a dobby connected with the said hook lever for imparting a swinging motion to the same,
50 to engage the said hook lever with the said wheel.

4. A loom having a shuttle box shifting mechanism comprising a cross head mounted to reciprocate and having top and bottom
55 bars provided with notches, a wheel mounted to turn and having pins for engagement with the said notches, the wheel also having projections, a hook lever for engaging the said projections and having continuous
60 bodily movement in a longitudinal direction, a dobby controlling the swinging motion of the said hook lever, for the latter to engage the said projections, and a connection between the said cross head and the shuttle
65 box to be shifted.

5. A loom having a shuttle box shifting mechanism comprising a cross head mounted to reciprocate and having top and bottom bars provided with notches, a wheel mounted to turn and having pins for engagement with
7 the said notches, the wheel also having projections, a hook lever for engaging the said projections and having continuous bodily movement in a longitudinal direction, a
8 dobby controlling the swinging motion of the said hook lever for the latter to engage the said projections, a connection between the said cross head and the shuttle box to be shifted, and means for locking the cross head in either of its end positions.

6. A loom having a shuttle box shifting mechanism comprising a cross head mounted to reciprocate and having top and bottom bars provided with notches, a wheel mounted to turn and having pins for engagement with
8 the said notches, the wheel also having projections, a hook lever for engaging the said projections and having continuous bodily movement in a longitudinal direction, a
9 dobby controlling the swinging motion of the said hook lever for the latter to engage the said projections, a connection between the said cross head and the shuttle box to be shifted, and means controlled by the said
95 wheel for locking the cross head in either of its end positions.

7. A loom having a shuttle box shifting mechanism comprising a cross head mounted to reciprocate and having top and bottom bars provided with notches, a wheel mounted to turn and having pins for engagement with
10 the said notches, the wheel also having projections, a hook lever for engaging the said projections, a bell crank lever on which the said hook lever is fulcrumed, a cam on the crank
10 shaft of the loom and engaging the said bell crank lever for imparting a continuous swinging motion to the said bell crank lever, a dobby connected with the said hook lever to impart a downward swinging motion to
11 the same, and a connection between the said cross head and the shuttle box.

8. A loom provided with a shifting device for the shuttle box comprising a cross head connected with the shuttle box and having
11 longitudinal bars each provided with notches, the bars being arranged in different vertical planes, an intermittently rotating wheel having sets of pins engaging the said notches, a
12 hook lever having a continuous bodily reciprocating movement and adapted to engage the said wheel, means for imparting a swinging motion to the said hook lever to move the latter in engagement with the said wheel, and means for returning the hook lever to normal
125 position.

9. A loom having a lay provided with a shuttle race, shuttle boxes mounted to slide at the ends of the lay, picker sticks extending through the shuttle boxes, each shuttle box
130

having a plurality of compartments arranged one alongside the other and communicating at their outer ends to permit of shifting the shuttle boxes to bring the desired compartments in register with the picker sticks and the shuttle race, shifting mechanisms independently connected with the said shuttle boxes, and each comprising a cross head and means for actuating the same, and means for controlling said shifting mechanisms independently one of the other.

10. A loom provided with a lay having a shuttle race, shuttle boxes mounted to slide at the ends of the lay and each having a plurality of compartments, means for shifting the shuttle boxes and comprising cross heads mounted to slide, connections between the cross heads and the shuttle boxes, mechanisms for intermittently reciprocating the cross heads, means for controlling said mechanisms, and means for locking either of said cross heads in the end positions.

11. A loom provided with a lay having a shuttle race, shuttle boxes mounted to slide at the ends of the lay, each shuttle box having a plurality of compartments arranged one alongside the other, shifting mechanisms independently connected with the said shuttle boxes and each having a cross head and means for actuating the same, spring pressed catches for engaging the cross heads to lock the same in the end positions, and means for controlling said shifting mechanisms independently one of the other.

12. A loom provided with a lay having a shuttle race, shuttle boxes mounted to slide on the ends of the lay and each having a plurality of compartments, a shifting mechanism for each shuttle box comprising a cross head connected with the shuttle box, an intermittently rotating wheel provided with means for engaging the cross head, a hook lever mounted to swing and having a reciprocating movement and adapted to engage the said wheel, means for moving the hook lever into engagement with the wheel, and a spring for returning the hook lever to normal position.

13. A loom provided with a lay having a

shuttle race, shuttle boxes mounted to slide on the ends of the lay and each having a plurality of compartments, adapted to register with the said shuttle race, shifting mechanisms for the shuttle boxes and each having a cross head mounted to slide and connected with one of said shuttle boxes, a rotatable device for imparting movement to each cross head, a hook lever for engaging and moving said device, the said lever being mounted to swing, mechanism for imparting a continuous bodily reciprocating movement to said lever, and means for swinging the said lever into engagement with said rotatable device.

14. A loom provided with a lay having a shuttle race, a shuttle box movable on the end of the lay and having a plurality of compartments, a cross head connected with the shuttle box to shift the same, a wheel for imparting movement to the cross head, a hook lever for engaging and moving said wheel, means for imparting a continuous bodily movement to said hook lever and comprising a bell crank lever on which said hook lever is fulcrumed, and a shaft provided with a cam engaging said bell crank lever, means for normally holding said hook lever out of engagement with the wheel, and means for imparting a swinging motion to the hook lever to engage the same with the said wheel.

15. A loom provided with a lay having a shuttle race, shuttle boxes at the ends of the lay, each shuttle box having a plurality of compartments, a cross head connected with each shuttle box to shift the same, a locking device for locking the cross head in either of its end positions, and mechanisms for imparting an intermittent reciprocating movement to the cross head, the said mechanism being adapted to move the locking device to release the cross head before reciprocating the latter.

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

WALTER J. GARLICK.

Witnesses:

THEO. G. HOSTER,
EVERARD B. MARSHALL.