

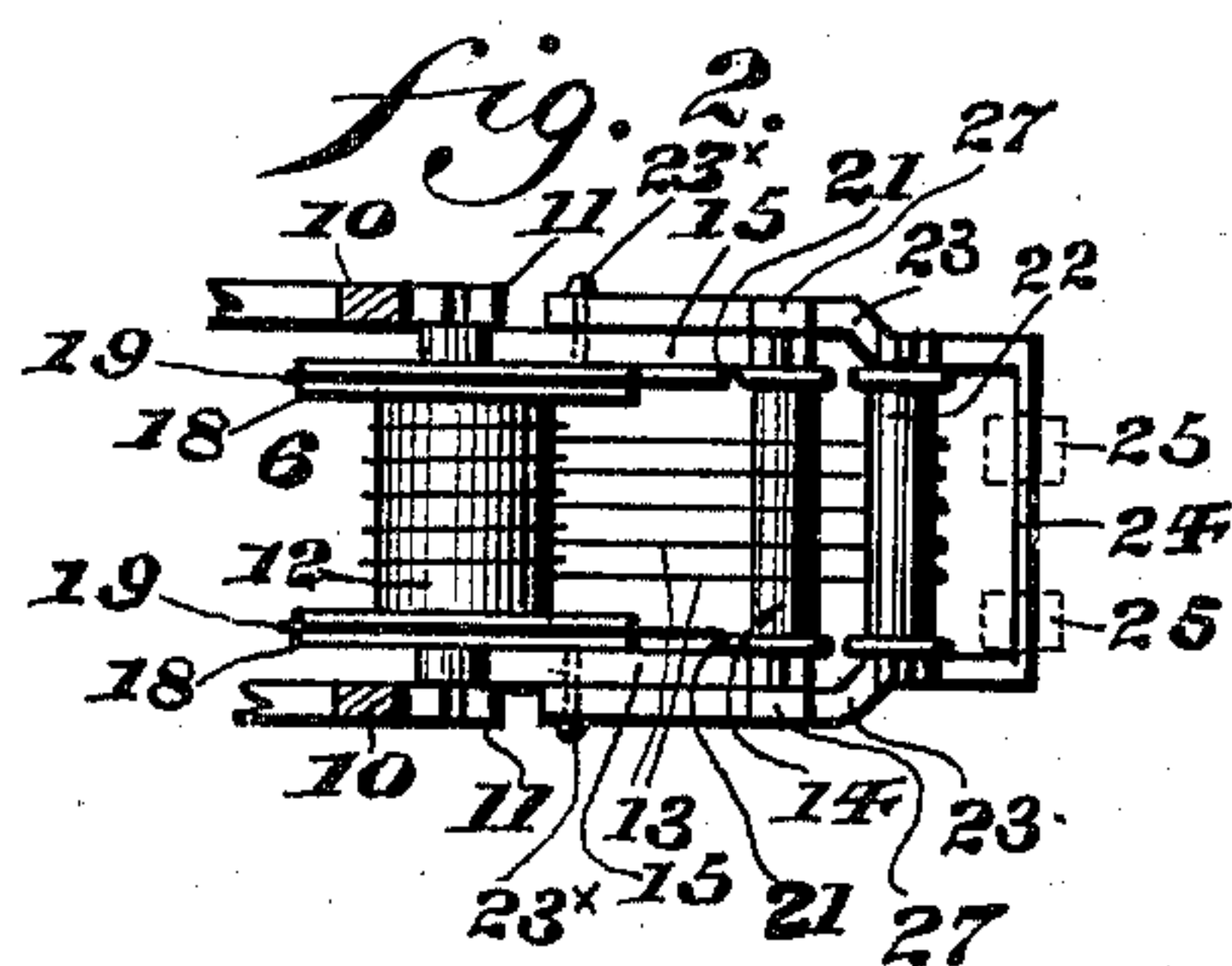
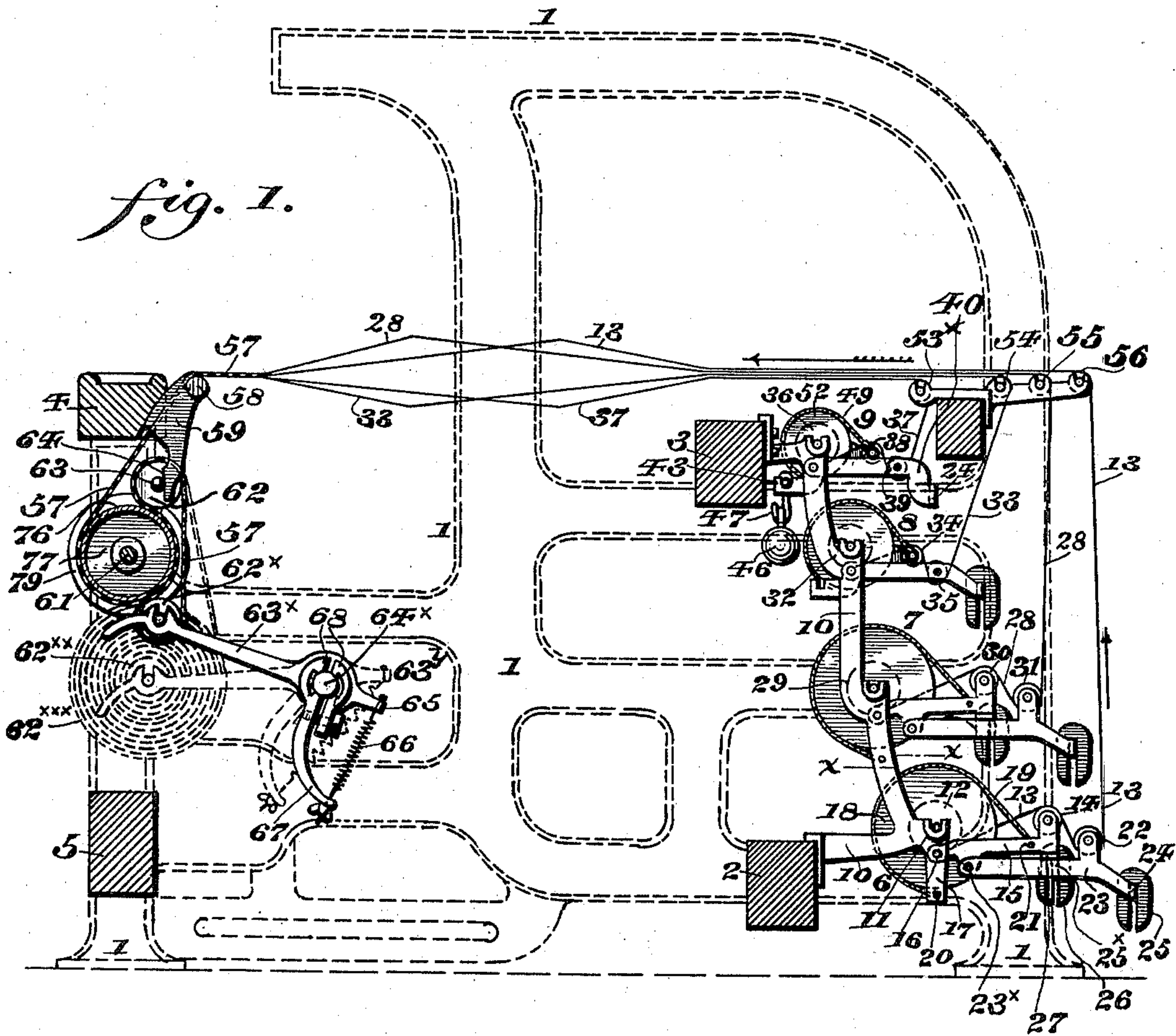
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2 Sheets—Sheet 1.

O. W. SCHAUM.
TAKE-UP AND LET-OFF FOR LOOMS.

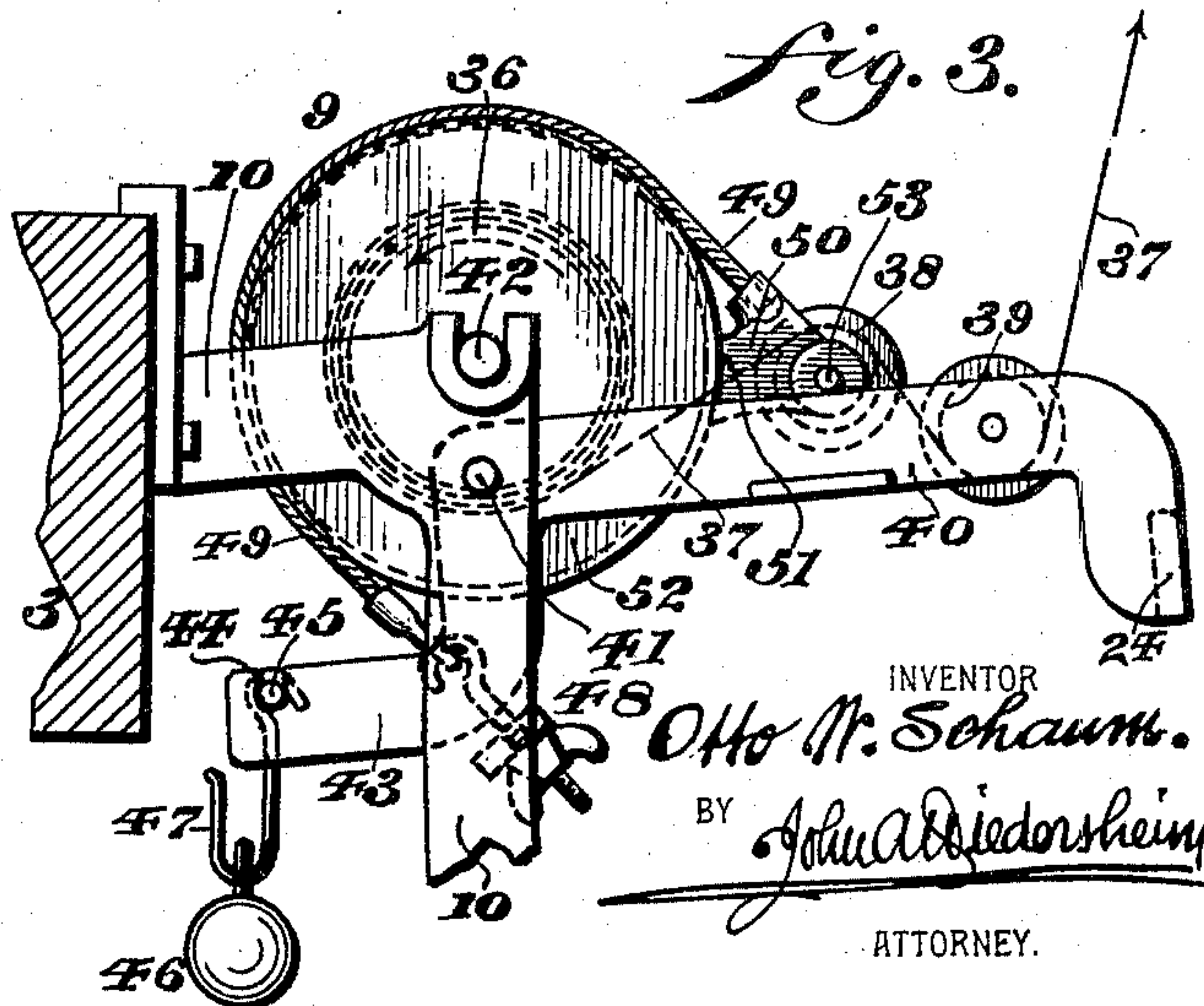
No. 584,793.

Patented June 22, 1897.



WITNESSES:

L. Douville,
P. H. Hughes



INVENTOR

Otto W. Schaum.

BY

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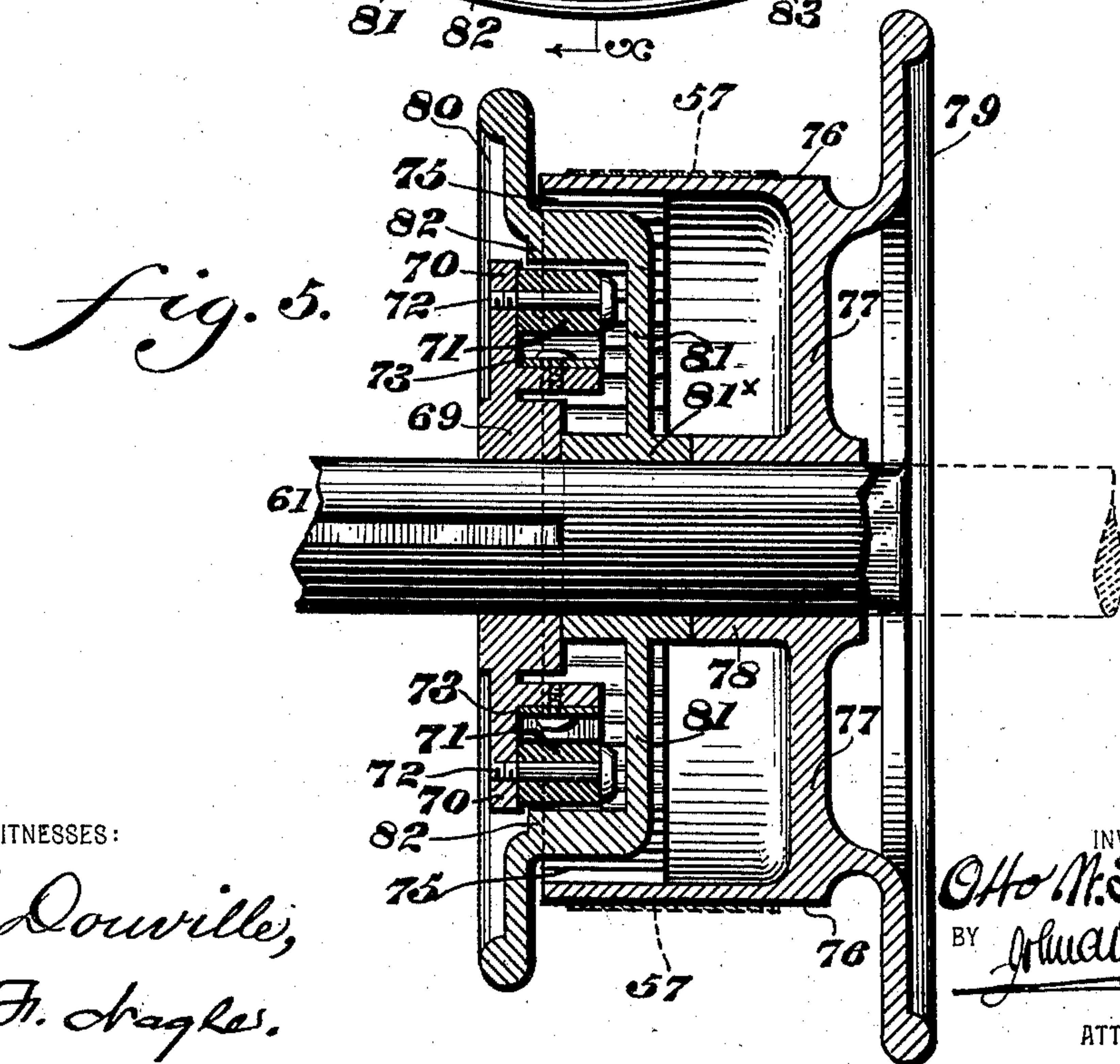
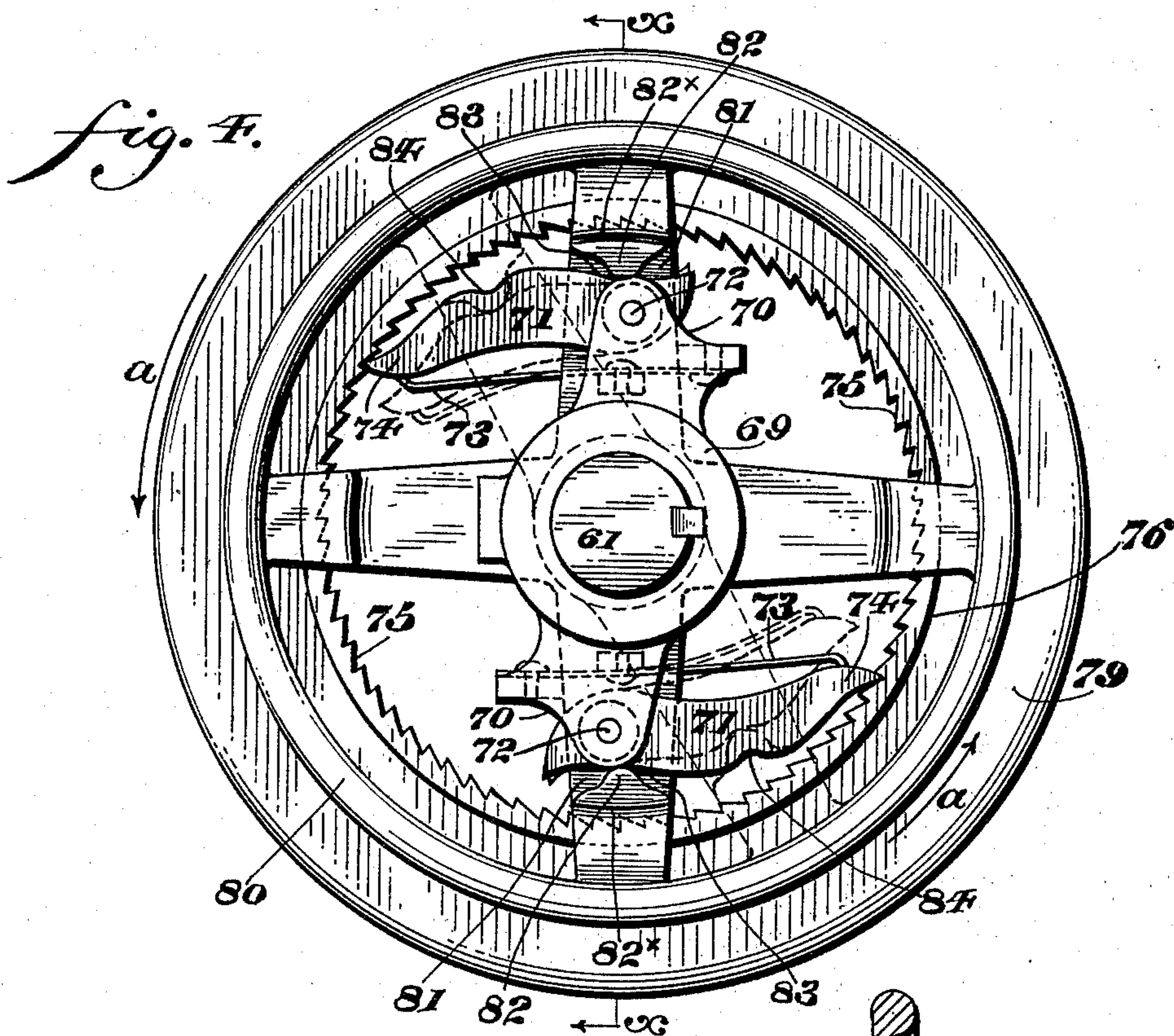
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2 Sheets—Sheet 2.

O. W. SCHAUM.
TAKE-UP AND LET-OFF FOR LOOMS.

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Patented June 22, 1897.



WITNESSES:

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*OTTO W. SCHAUM, OF PHILADELPHIA, PENNSYLVANIA.

TAKE-UP AND LET-OFF FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 584,793, dated June 22, 1897.

Application filed June 13, 1896. Serial No. 595,418. (No model.)

To all whom it may concern:

Be it known that I, OTTO W. SCHAUM, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Looms, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to looms, and more particularly to narrow-ware looms, as tape and ribbon looms, in which the take-up shaft carries an individual take-up roll for each section of material or web woven; and it consists, first, of a novel construction of automatic let-off motion in which a plurality of warp-beams are enabled to be employed, each having a let-off applicable thereto, thereby enabling the loom to be adapted for the production of a high-grade ribbon, the two lower beams being for the ground-warp, while the edge warp may also be properly weighted and balanced, and in addition the binder-warp may also be suitably counterbalanced in accordance with my invention, the above let-off devices being capable of adjustment to such a nicety that the weight of the counterbalancing-levers and their adjuncts employed is reduced to a minimum and the action of the mechanism is rendered invariably precise and accurate, even upon the most tender warps.

It further consists of a novel construction of take-up mechanism in which the number of parts is reduced to a minimum and the construction simplified throughout, the shafts and take-up rolls being provided with a ratchet-clutch which can be quickly and accurately set, and provision being further made for locking said take-up or clutch mechanism when in released position, as well as when the apparatus is in locked position, each take-up roll being thus enabled to be connected with or disconnected from the take-up shaft at pleasure, so as to allow said roll to be revolved independently of said shaft in either direction.

It further consists of a novel construction of tension mechanism whereby the tension on the fabric will always be substantially uniform, although the diameter of the wind-

ing-up roll is constantly increasing, the goods being thus caused to be wound smoothly and evenly thereupon under all conditions.

It further consists of novel details of construction, all as will be hereinafter set forth, and specifically pointed out in the claims.

Figure 1 represents a side elevation of a loom embodying my invention, showing in their relative assembled position the let-off, tension, and a portion of the take-up mechanism. Fig. 2 represents, on a reduced scale, a section on line *x x*, Fig. 1, showing a plan view of the let-off mechanism for the lower warp-beam and its adjuncts. Fig. 3 represents, on an enlarged scale, a side elevation of the top warp-beam for the binder-warp, showing the let-off mechanism and its adjuncts applied thereto. Fig. 4 represents, on an enlarged scale, a side elevation of the take-up mechanism employed in detached position. Fig. 5 represents a section on line *x x*, Fig. 4.

Similar numerals of reference indicate corresponding parts in the several figures.

Referring to the drawings, 1 designates the framework or housing of the loom, which latter, except for the novel features which constitute my invention, may be of usual or convenient construction.

2, 3, 4, and 5 designate rails or beams which serve to support or brace said housing and assist to sustain certain of the principal operative parts of my invention.

6 and 7 designate, respectively, the lower or larger warp-beams and the let-off mechanism therefor, while 8 designates the edge warp with its let-off motion, and 9 designates the binder-warp with its counterbalanced let-off motion, the detailed construction of each of which will be hereinafter set forth.

10 designates side frames, which, it will be understood, are two in number and are attached at their upper and lower portions to the upper and lower rails 3 and 2, respectively, in any suitable manner. The lower portion of said frame 10 is provided with bearings 11, in which rotate the journals of the lower warp-beam 12, from which the ground-warp 13 is unwound, the latter passing over the roller 14, which is journaled in suitable bearings in the levers 15, it being understood that the

same are two in number, one on each side of the roller, said levers being pivotally attached at 16 to the extensions 17 of the side frames 10.

18 designates disks or flanges of increased diameter which are attached to the warp-beam 12, near each end of the same, said flanges being preferably grooved and having the cords or flexible connections 19 passing therearound for a portion of their periphery, one end of each of said connections being attached at the point 20 to the extension 17, while its other end is attached to the lever 15 at about the point 21, it thus being seen that each of the levers 15 is supported by means of the connections 19.

The ground-warp 13, after passing over the roller 14, supported in the manner described, passes under the roller 22, which is journaled in suitable lugs attached to the levers 23, said levers being pivotally attached at one end at the point 23^x to the levers 15, while their other ends are provided with a cross-bar 24, upon which the weights 25 are adapted to be placed, the ends of the levers 15 being joined by means of a similar cross-bar 25^x, the location of which will be understood from the right-hand portion of Fig. 1, said latter cross-bar being adapted to sustain weights 26.

27 designates lugs projecting from each of the levers 15, so as to be in the path of the levers 23 when the latter are elevated to a certain degree, as will be understood from Figs. 1 and 2.

28 designates the other ground-warp, which is unwound from the other lower warp-beam 29, which is suitably supported, said ground-warp 28 passing over the roller 30 and under the roller 31, each of said latter rollers being mounted upon levers which are supported, counterbalanced, and weighted with respect to each other in substantially the same manner as the let-off mechanism of the warp-beam 12, which has already been described.

32 designates the warp-beam for the edge-warp 33, the latter being unwound therefrom and passing first over the roller 34 and thence under the roller 35.

36 designates the warp-beam for the binder-warp 37, which is unwound therefrom and passes over the roller 38 and then under the roller 39, the construction of the let-off mechanisms 8 and 9 for said edge-warp and binder-warps, respectively, being substantially identical, and therefore a description of one will suffice for both, reference being had to Fig. 3, which shows, on an enlarged scale, a side elevation of the top or binder warp and its adjuncts.

The roller 39 has its bearings in the lever 40, which is pivotally attached at 41 to a suitable portion of the side frames 10, in which latter the journals 42 of the binder-warp beam have their bearings.

43 designates downward, rearward and extending arms attached to the levers 40, which arms in the present instance are provided

with notches 44, which support the rod 45, upon which the weights 46 are adapted to be hung through the medium of suitable hooks 47.

48 designates an attaching device for the cords or other suitable connections 49, which pass around the flanges or disks 52, one end of each of said cords being attached to said devices 48, while the other extremity is secured to the block 50, which has one portion 51 thereof adapted to contact with the flanges or disks 52 and thus act as a shoe to retard the motion thereof, as will be explained, the pins 53 on which the roller 38 revolves projecting from the outersurface of each of said blocks 50 and adapted to be engaged by the levers 40 when desired, so that said shoes 51 are lifted from their contact with the flange 52, at the same time slackening the connections 49 when the levers 40 have been elevated into contact with said pins or projections 53.

53^x, 54, 55, and 56 designate rollers over which the binder-warp, edge warp, and ground-warps 37, 33, 28, and 13, respectively, pass, said rollers being mounted in suitable bearings which may be supported in any convenient manner.

The aforesaid warps, after passing through a suitable harness, are woven to form the fabric or ribbon 57, which passes first over the breast-beam roller 58, which is supported on brackets 59, thence around and under the take-up roll or drum 76, which is provided with a shaft 61, which has suitable bearings, the said fabric passing thence around the press-roller 62, which is preferably made of iron or other suitable material and has its journals 63 contacting with the substantially-vertical faces 64 of the brackets 59, said press-roller being held in position by the fabric 57 and the brackets 59, as indicated at the left of Fig. 1, said fabric or ribbon afterward passing around the lower auxiliary or winding-up roll 62^x, upon which it is wound.

63^y designates a tension device whereby the woven goods are caused to be wound smoothly and evenly upon the winding-up roll 62^x, the same consisting of the levers or arms 63^x, which are loosely mounted upon the shaft 64^x, each of said arms having an extension or lug 65, to which one end of the spring 66 is attached, the other end of the latter being secured to the arm 67, which is mounted on the shaft 64^x and is provided with a suitable clamping device 68, whereby the position of said arm 67 relative to the shaft can be adjusted at will, said arm 67 being normally fast upon the shaft 64, whereupon it will be seen that a uniform tension will always be exerted upon the winding-up roll 62^x under all conditions as its diameter increases, the diameter of said roll being indicated by the dotted line 62^{xx} and the diameter of the full roll being indicated by the dotted lines 62^{xxx}, and the relative position

of the arms when substantially a maximum quantity of ribbon is being wound upon said winding-up roll being indicated in dotted lines at the left of Fig. 1. It will of course be understood that there are a pair of arms 63^x and their adjuncts for each winding-up roll 62^x.

The description of the take-up mechanism will now be referred to, reference being had to Figs. 4 and 5. The shaft 61 of the take-up roll or drum 76 has keyed or splined thereto the hub or collar 69, which latter has the ears 70 projecting therefrom, upon which are pivotally mounted the pawls or dogs 71 through the medium of the pins 72 or other similar device.

73 designates springs, each of which has one of its ends rigidly attached to a suitable portion of the ears 70 or the collar, while their free ends are adapted to bear upon the noses 74 of the pawls 71, thereby causing the latter to positively engage the ratchet-teeth 75, which are located upon the interior periphery of the take-up roll or drum 76, which is provided with a web 77, the latter being attached to the hub 78, which has a loose bearing upon the shaft 61, the drum 76 being readily rotated when desired at the proper intervals by means of the hand-wheel 79 after the pawls have been removed from engagement with the ratchet.

80 designates a hand-wheel which is provided with the offset spokes 81, which lead to the hub 81^x, which has also a loose bearing on the shaft 61, that portion 82^x of said spokes 81, which is laterally deflected, being provided with lugs 82, which are adapted to normally seat in the recesses 83 of the pawl 71, thereby enabling the noses 74 of the latter to engage the ratchet-teeth when the parts are in the position seen in full lines in Fig. 4.

84 designates a recess or depression in each of the pawls 71 intermediate their noses and their pivotal attachment, in which the projection or lug 82 is adapted to seat when the parts are moved into the position seen in dotted lines in Fig. 4, said pawls 71 being disengaged from their ratchets and thus positively locked when in released position.

The operation is as follows, a description of the let-off motion being first described, and reference being had to the right-hand portion of Fig. 1 and to Figs. 2 and 3: Referring first to the let-off mechanism 6 and 7 for the ground-warps, it will be noted that before the parts are in their relative operative position the levers 23 will be dropped slightly from the position seen in Fig. 1, the top of said levers being out of contact with the lugs 27, whereupon it will be seen that a pull on the ground-warp thread 13 will not cause the unwinding of said warp from the warp-beam 12 by reason of the friction engendered between the rollers 14 and 22 and the said warp 13, and especially because of the friction between the connections 19 and the disks or flanges 18, until the roller 22 and the lever 23 have been pulled upwardly into the relative

position seen in Fig. 1, the weight of the levers 15 normally exerting a pull on said connections 19 and thus tending to retard the rotation of said warp-beam 12. As soon, however, as the levers 23 have been elevated into the position seen in said Fig. 1 by a pull on the warp 13, the levers 15 will be slightly raised, thereby slackening the connections 19, whereupon a further pull on the warp 13 will enable the same to be readily unwound from the warp-beam 6; and by applying the weights 25 and 26 to their respective cross-bars it will be seen that the amount of tension required to unwind the warp 13 from the warp-beam can be regulated with great exactness.

The above description of the let-off motion is also applicable to the upper ground-warp beam and its adjuncts 7, the let-off motion of the edge warp and the binder-warp being also substantially the same in principle, reference being had especially to Fig. 3.

When the parts are in their normal position, the right-hand end of the lever 40 will be depressed from the position seen in Fig. 3, whereupon the weight of the roller 38 and the blocks 50 will cause the shoes 51 to contact with the flanges or disks 52 of the warp-beam 36, and by reason of said contact and also that of the connections 49 with said disks a pull on the binder-warp or edge warp in the direction of the arrow will not allow said warps to be unwound until the levers 40 have been elevated into substantially the position seen in Fig. 3, so that they engage either the pins 53 or a suitable portion of the blocks 50, thereby lifting said shoes 51 slightly and simultaneously slackening the connections 49, whereupon the rotation of the disks or flanges 52 and the warp-beam 36 not being retarded the warps 37 or 33 can be readily unwound, as is evident.

By weighting the arms or extensions 43 of the levers 40 through the medium of the weights 46 and their adjuncts it will be seen that the counterbalanced levers can be set to such exactness that the weight of the let-off mechanism is reduced to a minimum, and its action is invariably precise even upon the most tender warps, whereby I am enabled, instead of equipping the loom with two warp-beams per space, one for ground and one for edge warps, as heretofore, to adapt the loom equally well for high-grade ribbon, where such is desired, by equipping the same with four warp-beams per space, the two lower ones being for the ground-warps, while the third row from the bottom is for the edge warp, the top row being for the binder-warp, and all having their let-offs accurately and effectively counterbalanced in the manner described, it being of course understood that the levers 40 are provided with cross-bars 24, adapted to be weighted in the same manner as the levers 15 and 23.

Especial emphasis is laid in the present case upon the function attained by the employ-

ment of the weights 46 and the counterbalanced levers above referred to, since in edges or binders of fine silk ribbon, where only a few threads are used, it becomes necessary to weight the warp lightly and with great exactness. This is not possible in the old constructions, as the actual weight of the lever is the very smallest amount of weight that can be secured, but by my novel construction of counterbalanced levers as much weight can be put behind the beam as the lever weighs in front, and thus secure a practical equilibrium, after which any very light weight becomes operative without difficulty. For instance, if a lever weighs eight ounces, then eight ounces is the smallest weight that can be put on in the old style, but by having a weight of seven ounces on my new lever behind the beam one ounce or the actual weight wanted can be secured on the warp-threads, a feature which, it will be seen, cannot be obtained in prior constructions.

The tension device will next be described, reference being had to the left-hand portion of Fig. 1, the winding-up roll 62 when the ribbon is first wound thereupon assuming the position relative to the take-up roll or drum seen in full lines in Fig. 1, the arm 63^x being loosely mounted on its shaft and its proper position being assured through the medium of the spring 66, common to the extension 65 of said loose arm and the rigid arm 67, whereupon it will be seen that as the ribbon or fabric is wound upon the winding-up roll 62^x and as the diameter of the same increases it will under all conditions be wound firmly and smoothly thereupon, the same being held against the taking-up roll through the medium of the spring 66 and revolving in unison therewith by reason of the friction of the fabrics, the dotted lines to the left of Fig. 1 indicating the size of the said winding-up roll and the relative position which the loose arms 63^x assume when said roll is filled, the tension of the spring 66 being adjusted according to requirements by shifting the arm 67, as is evident.

The course of the fabric after leaving the breast-beam roll is apparent from the left of Fig. 1, the same passing over and around the take-up roll, and thence around the press-roll 62, and being finally wound firmly and smoothly on the winding-up roll.

The take-up will next be described, reference being had especially to Figs. 4 and 5. The shaft 61 has a collar 69, keyed or otherwise secured thereto, upon which the pawls 71 are mounted, the latter normally engaging the interior ratchet 75, as indicated in full lines in Fig. 4, by reason of the springs 73, whereupon it will be seen that the collar 69 will rotate simultaneously with the shaft 61 through the engagement of the pawls with the ratchet-teeth 75 on the interior of the roll or drum 76, and the latter will be caused to rotate in unison with the movement of the shaft 61, the hand-wheel 80 and its adjuncts

being also in the position seen in full lines in Fig. 4, the lugs 82 resting in the concavity 83 of the pawls 71. If now it should be desired to temporarily stop the rotation of the drum 76 for any reason without stopping the rotation of the shaft 61, it is only necessary to turn the hand-wheel 80 in the direction of the arrow *a* in Fig. 4, whereupon the lugs 82 will engage the depressions 84 of said pawl and will move the same out of engagement with the ratchet, as indicated in dotted lines in said Fig. 4, especial emphasis being laid upon the fact that said pawls are locked when in disengaged position from their ratchet, as will be apparent, after which it will be seen that by means of the hand-wheel 79 the drum or roll 76 can be rotated in either direction for whatever purpose desired, as for repairs, inspection, &c.

The feature of having the pawls locked when in disengaged position is of the greatest practical value, since as on a narrow fabric loom at the end of each set of warps, which are generally of uneven length, the shortest warp or the one first done can be unlocked and thus remain stationary while the others are being woven down, thus permitting every yard of warp to be woven no matter what variations in length there may be, whereas in prior constructions each warp has to be cut out as soon as the end of the shortest one is reached, as the pawls of the take-up mechanism cannot be positively locked in the released position.

Especial emphasis is also laid upon the simplicity of the movement and operation of the take-up mechanism, no skilled labor or strength being required to manipulate it, any inexperienced person being enabled to set it without possibility of variation to blemish the ribbon or mar its texture.

It will be understood that various changes may be made by those skilled in the art, which will come within the scope of my invention, without departing from the spirit of the same, and I do not, therefore, desire to be limited in every instance to the exact construction I have herein shown and described.

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

1. In a loom the combination with a warp-beam having flanges thereon of a friction device, the same consisting of flexible connections passing around said flanges, one end of said connections being secured to a fixed point, movable blocks to which the other ends of said connections are attached, said blocks having shoes contacting with said flanges, and a roller journaled in said blocks.

2. In a loom, the combination with a warp-beam having flanges thereon, of a friction device, the same consisting of flexible connections passing around said flanges, one end of each of said connections being secured to a fixed point, movable blocks to which the other ends are attached said blocks contacting with

said flanges, a roller journaled in said blocks, a set of levers suitably fulcrumed and adapted to be raised into engagement with said blocks, and a roller supported in said levers, the warp being adapted to pass over the first and under the second roller respectively.

3. In a loom, the combination with a warp-beam of a let-off therefor, the same consisting of flexible connections contacting with suitable portions of said warp-beam, one end of each of said connections being attached to a fixed point, movable blocks to which the other extremities of said connections are secured, said blocks being normally in contact with a portion of said warp-beam, and adapted to retard the rotation of the latter, levers suitably fulcrumed and provided with weights in front of and behind their fulcrum, and a roller journaled on said levers.

4. In a loom, a let-off mechanism consisting of levers suitably fulcrumed and counterbalanced in front of and behind their fulcrum, a warp-beam, flexible connections passing around the same, each having one end secured to a fixed point, movable blocks to which the other ends are attached, shoes on said blocks adapted to contact with a suitable portion of said warp-beam, a roller journaled in said blocks, a roller journaled in said levers, the latter being adapted to contact with said blocks and raise the shoes, and so slacken the connection passing around the warp-beam, when desired.

5. In a loom, a let-off mechanism consisting of levers suitably fulcrumed and counterbalanced in front of and behind their fulcrum, a warp-beam having flanges thereon, flexible connections passing around said flanges, each having one end secured to a fixed point, movable blocks to which the other ends of said connections are attached, shoes on said blocks normally in contact with said flanges, a roller journaled in said blocks, pins projecting from said blocks into the path of said levers, and a roller journaled in said levers, the contact of the latter with said pins raising said blocks.

6. In a loom, a take-up consisting of a breast-beam roll, a take-up roll or drum thereunder, a press-roll having journals thereon, and held in position intermediate said take-up roll and breast-beam roll by the fabric passing around the same, brackets suitably supported and having upright bearing-surfaces, against which latter said journals normally contact, a winding-up roll, rocking arms in which said latter roll is journaled, a stationary shaft on which said arms are mounted, and tension devices for said rocking arms.

7. In a loom, the combination of the take-up mechanism with a winding-up roll, a stationary shaft suitably supported, arms loosely mounted on said shaft and having said roll journaled therein, lugs on said arms projecting beyond said shaft, another set of arms mounted on said shaft, clamping devices for securing said arms in fixed position, and

springs common to said lugs and last-mentioned arms.

8. In a loom, a take-up mechanism consisting of a take-up shaft, a collar fast thereon, a drum on which the fabric is wound, ratchet-and-pawl mechanism intermediate said collar and drum, means for disengaging the pawl and ratchet and a lock for holding the pawl when the latter is disengaged from its ratchet.

9. In a loom, a take-up shaft, a collar fast thereupon, spring-pressed pawls supported on said collar, and a drum loosely mounted on said shaft, and having its interior periphery provided with ratchet-teeth adapted to be engaged by said pawls, in combination with means for throwing said pawls out of engagement with said teeth, and a lock for holding said pawls when the latter are disengaged from said teeth.

10. In a loom, a take-up mechanism consisting of a take-up shaft, a collar fast thereupon, pawls pivotally mounted on said collar, springs bearing on said pawls, a drum loosely mounted on said take-up shaft, the inner periphery of said drum being provided with ratchet-teeth adapted to be engaged by said pawls, the latter having a plurality of depressions therein, a hand-wheel loosely mounted on said shaft, and having lugs thereon adapted to engage the depressions in said pawls, whereby the latter can be locked when disengaged from their teeth.

11. In a loom, the combination of a take-up shaft and a take-up roll with the herein-described ratchet-clutch, the same consisting of a collar fast on said shaft, pawls pivotally attached to said collar, a drum loosely mounted on said take-up shaft, the inner periphery of said drum being provided with ratchet-teeth, means for causing said pawls to normally engage said teeth, means for throwing said pawls out of engagement with said teeth when desired, and a lock for holding said pawls when disengaged from said teeth.

12. In a loom, a take-up shaft, a collar fast thereon, pawls having depressions therein and pivotally attached to said collar, springs bearing on said pawls, a drum loosely mounted on said take-up shaft, and having its inner periphery provided with ratchet-teeth adapted to be engaged by said pawls, a hand-wheel attached to said drum, a second wheel loosely mounted on said take-up shaft and having a lug thereon adapted to engage said pawls and to be seated in the depressions therein whereby said pawls can be locked when released from said ratchet-teeth.

13. In a loom, a winding-up roll, a shaft suitably supported, arms having an extension thereon loosely mounted on said shaft, upon which arms said winding-up roll is supported, other arms also mounted upon said shaft, clamping devices common to the latter and said last-mentioned arms, and tension devices connecting the latter arms and said extensions.

14. In a loom, the combination of a take-up

mechanism with a winding-up roll, a shaft suit-
ably supported, arms loosely mounted on said
shaft and having said roll supported there-
upon, lugs on said arms projecting beyond said
5 shaft, another set of arms adjustably mounted
on said shaft, clamping devices for securing
said arms in fixed position, and tension de-

vices common to said lugs and last-mentioned
arms.

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Witnesses:

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