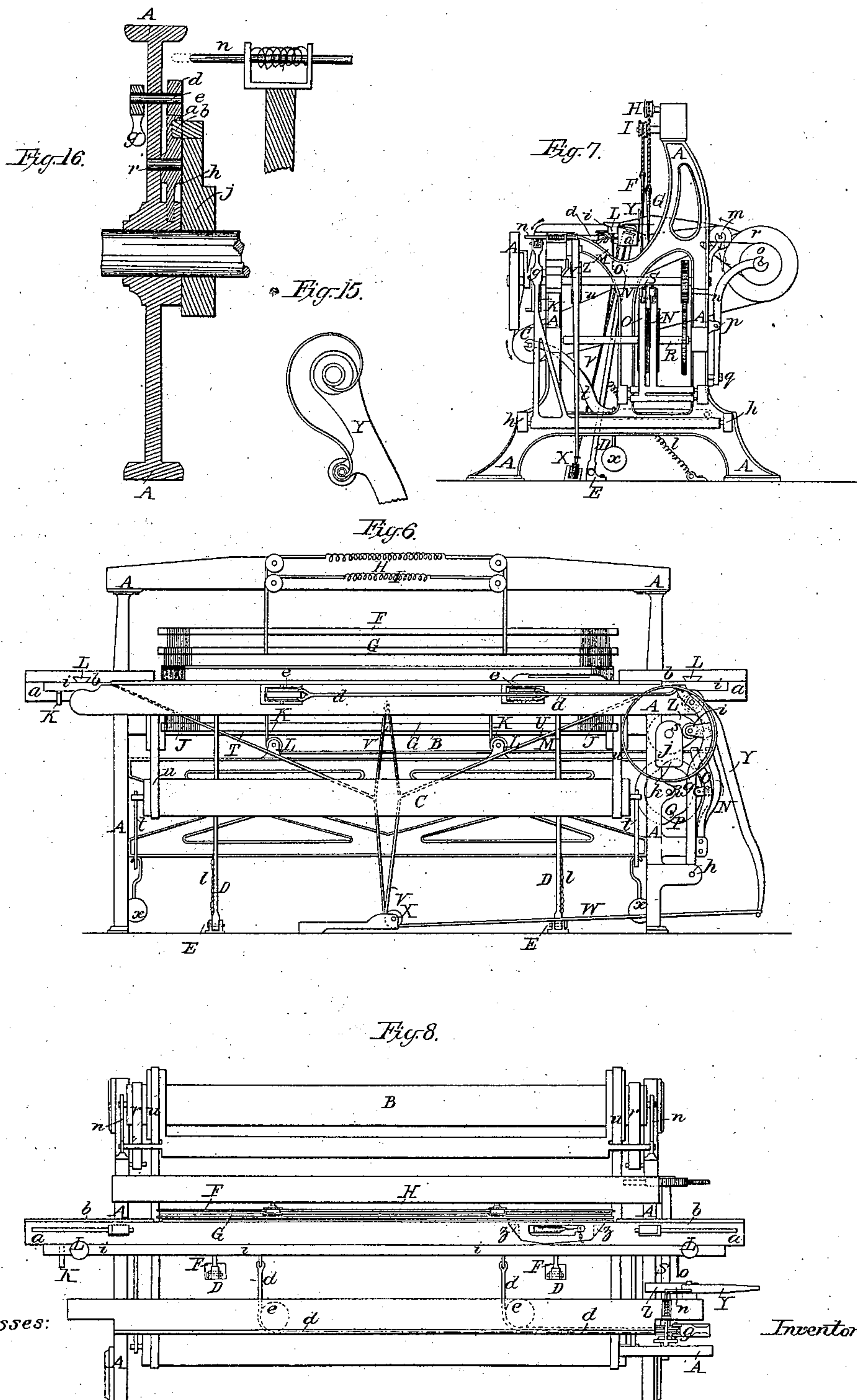


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LOOM FOR WEAVING VARIOUS KINDS OF FABRICS.

No. 187.

Patented May 8, 1837.



Witnesses:

Inventor:

James Bischoff

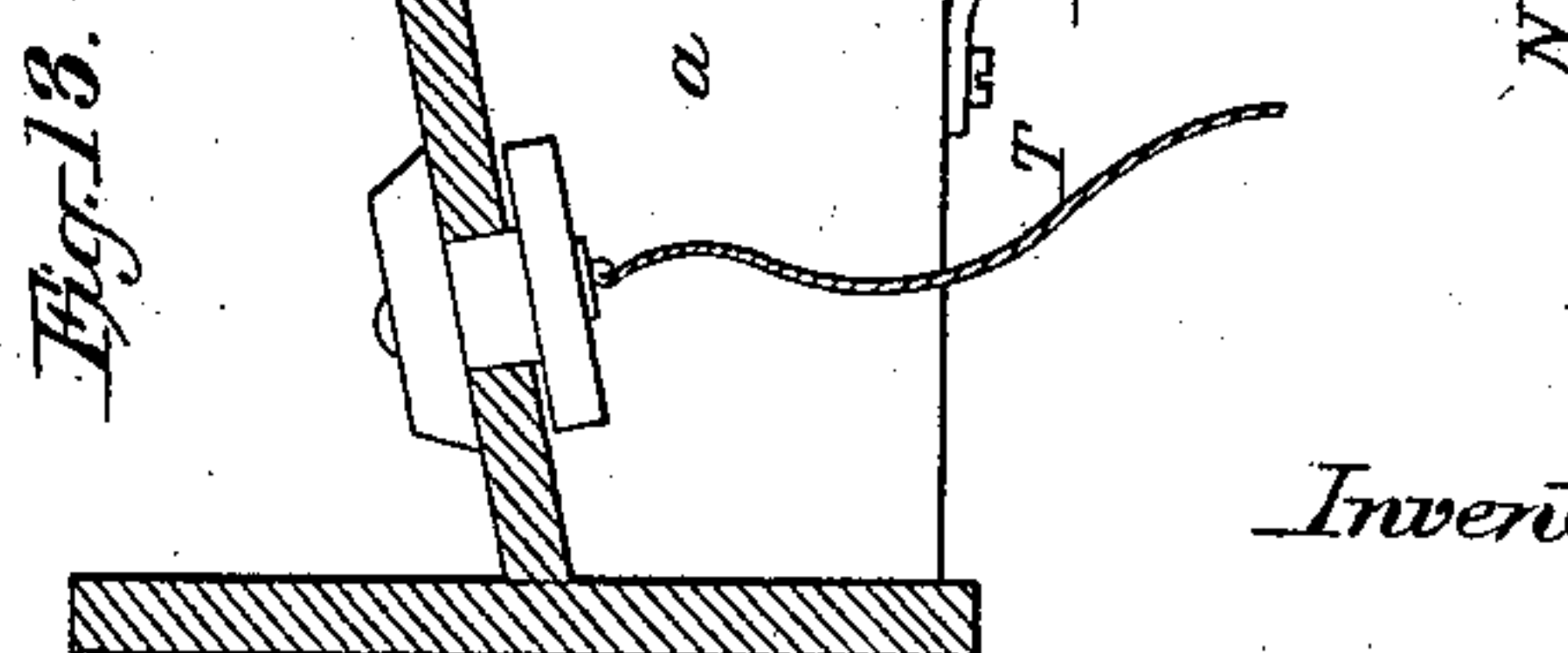
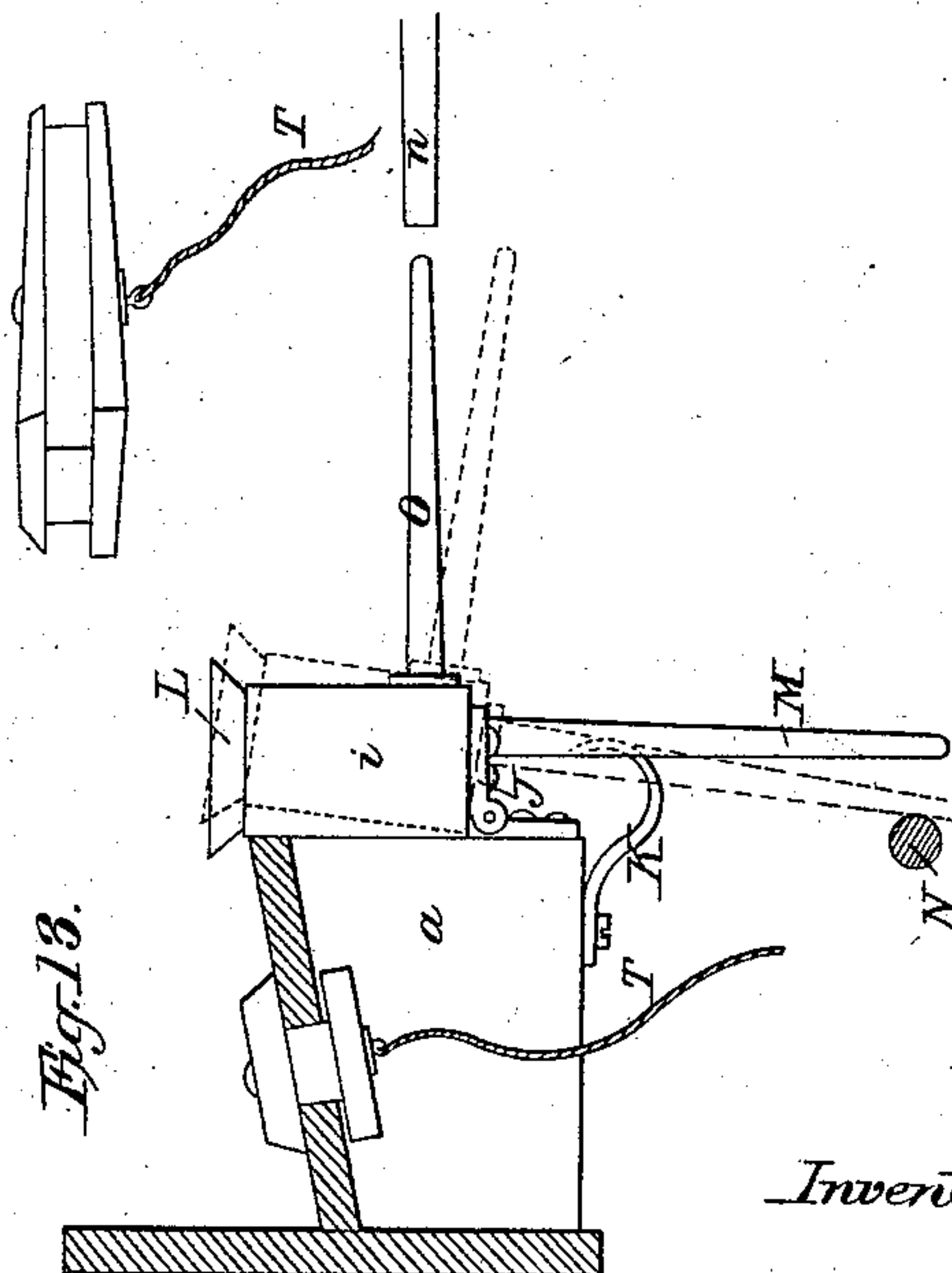
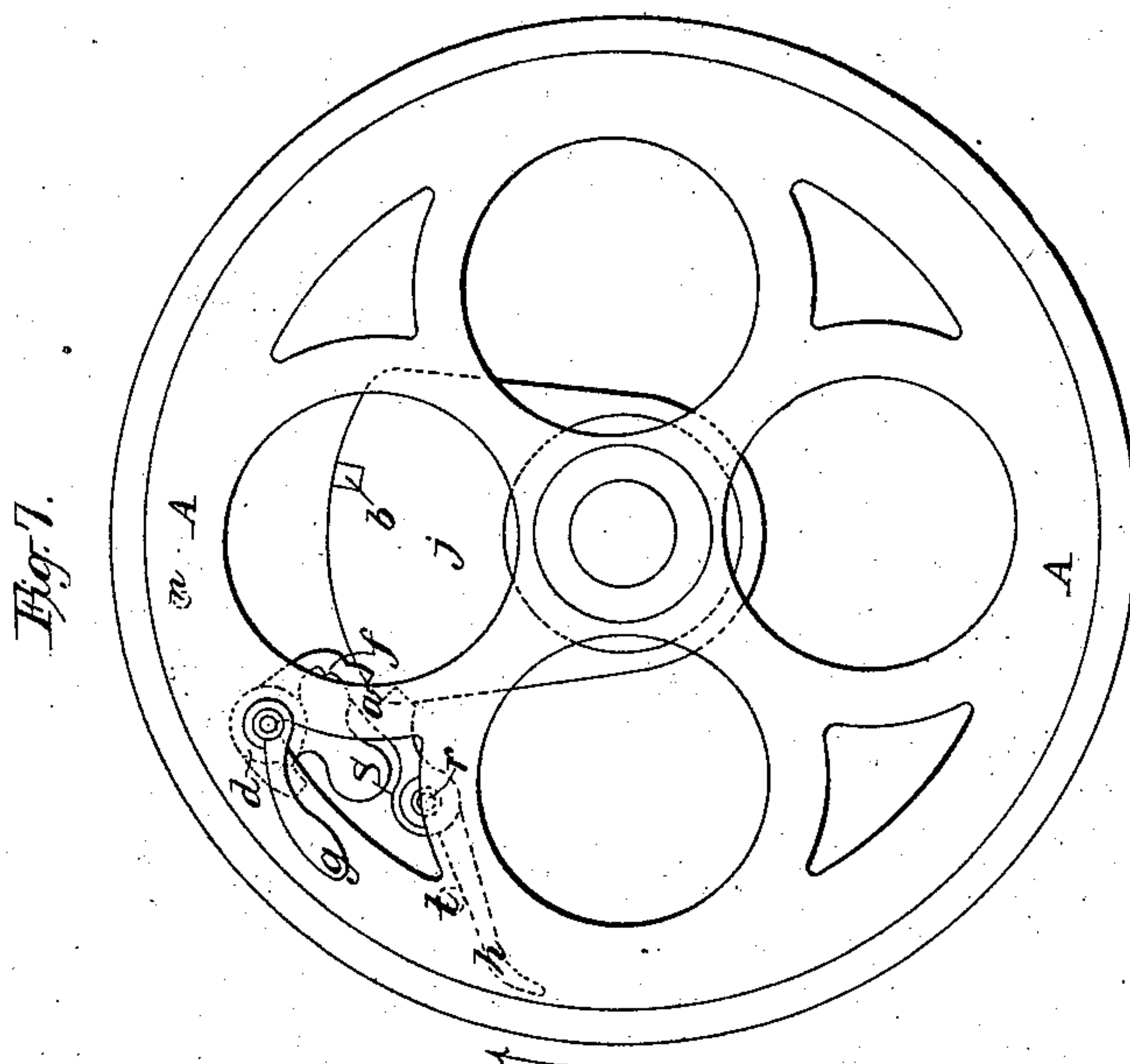
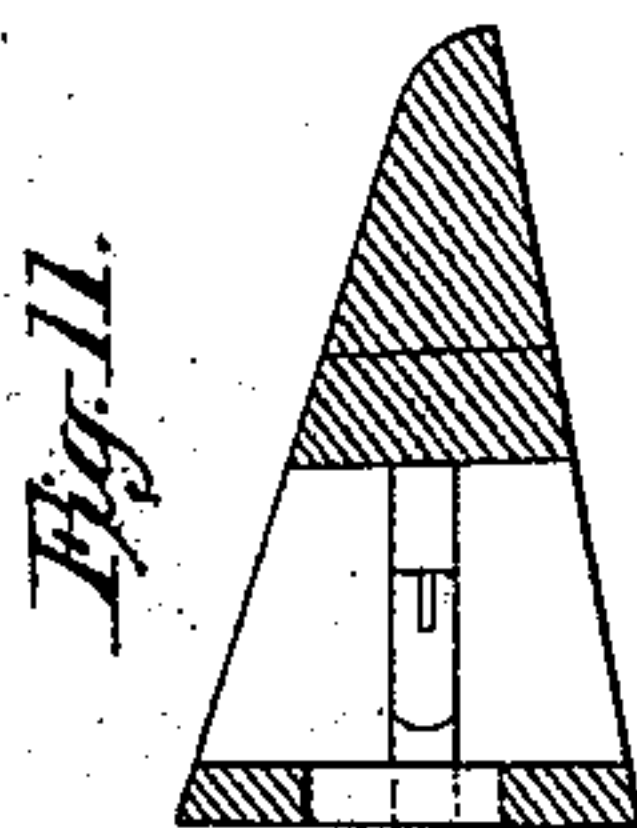
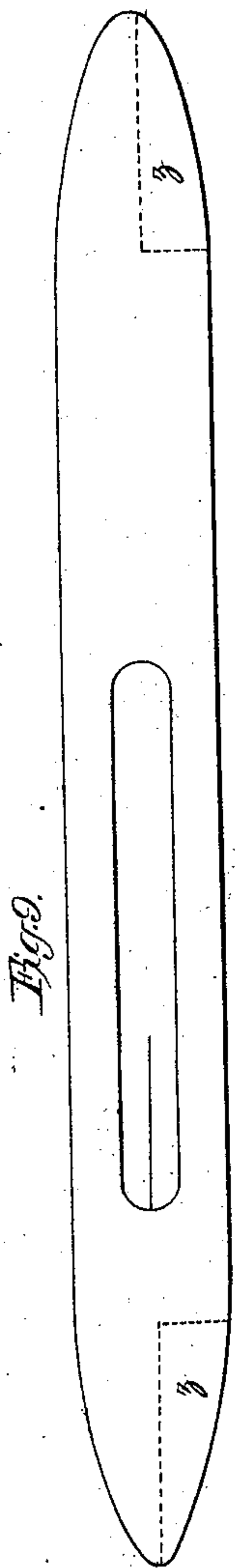
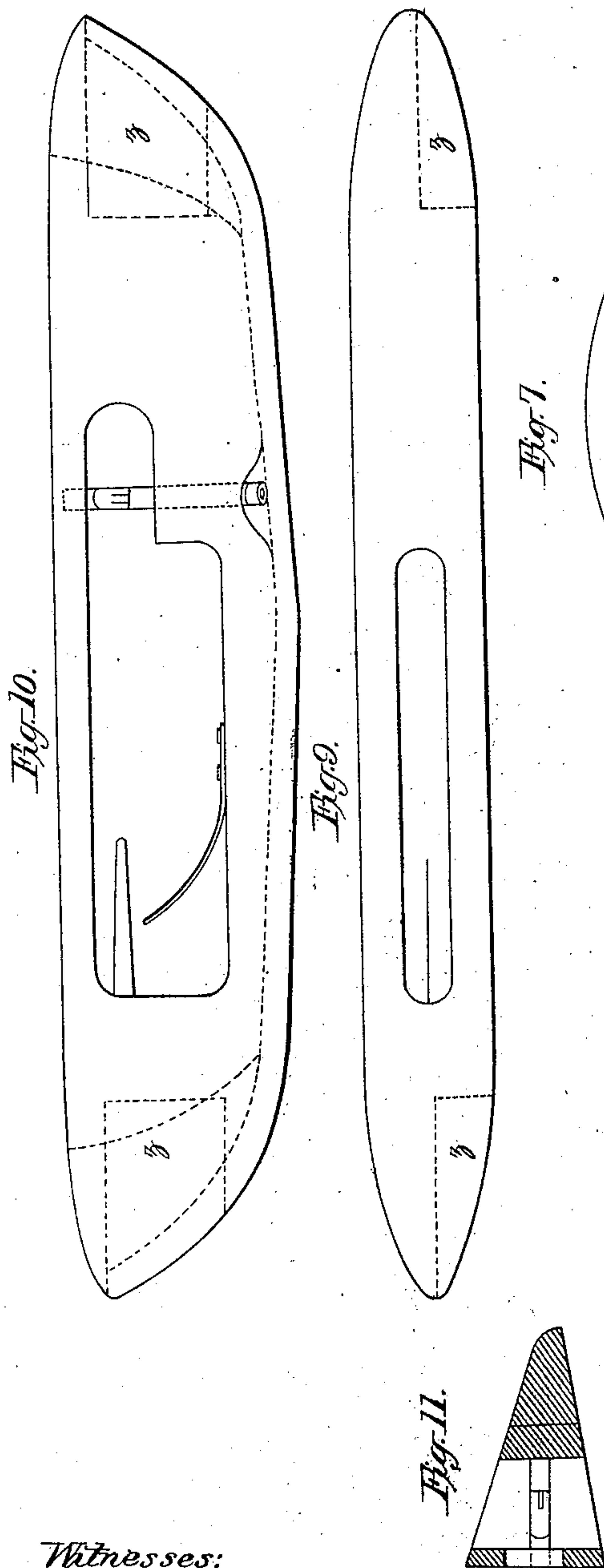
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UNITED STATES PATENT OFFICE.

CHRISTIAN W. SCHÖNHERR, OF LONDON, ENGLAND.

LOOM FOR WEAVING VARIOUS KINDS OF FABRICS.

Specification of Letters Patent No. 187, dated May 8, 1837; Antedated March 21, 1837.

To all whom it may concern:

Be it known that I, CHRISTIAN WILHELM SCHÖNHERR, a subject of the King of Saxony, but now on a visit to England, and residing
5 for the present in London, England, have invented certain new and useful Improvements in Machinery for Weaving Certain Fabrics; and I do hereby declare that the following is a full and exact description
10 thereof, that is to say, I do hereby declare the nature of the said invention to consist—

First, in causing the movement of the heddles requisite to form the shed to be performed by the action of cams and levers
15 placed vertically and at the end of the loom acting upon horizontal bands and pulleys and the counter action of which levers is effected by means of springs, bands and pulleys in manner hereinafter described.

20 Secondly, In a new picker and new mode of arranging the picking straps and acting upon them by means of what I call a loop or bridle and a check string fixed to a swinging lever as also in a new mode of holding
25 the shuttle fast at the end of the stroke or pick.

Thirdly, In forcing home the weft by means of a cam acting upon and producing a gradual pressure and dwelling action
30 of the lay or slay instead of the blow usually given.

Fourthly, In a new mode of regulating the giving off of the warp and the taking up of the cloth whereby a more simple mode of
35 compensation for the increasing circumference of the one and the diminishing circumference of the other is obtained than heretofore.

Fifthly, In an improved driving pulley
40 which may be disengaged instantly from the working shaft without touching the driving strap, and

Lastly, in a new form of shuttle whereby I am enabled to use a shed of diminished
45 size and action and I do hereby further describe the manner in which the said invention is to be performed by the following statement thereof, reference being had to the drawings annexed hereto and to the fig-
50 ures and letters marked thereon, that is to say,—The scales to which the annexed

drawings are made are marked thereon and similar letters and colors are used to denote similar parts in all cases where the same machine is under description whatever view
55 of it the figure may represent while the line of rotation or motion is denoted where necessary by arrows, and distinctive colors are used to distinguish the various parts of each principal movement. 60

Figure 6 is a front elevation of a loom for weaving all such goods as are now usually woven by hand or power looms. The parts marked A, denote the ordinary framing of the loom. B, is the ordinary warp beam; C, 65 the ordinary cloth beam. D, D, are the ordinary swords or arms for supporting the lay and moving on the ordinary fulcrums E, E, fixed on the floor for that purpose. F, G, are a set of ordinary heddles such as
70 are required for plain weaving it having been thought best to describe the said improvements as applied to a loom of the simplest form in order to be more easily understood from description. Having thus 75 pointed out the principal parts of the loom which have no features of novelty in them I will next proceed to describe the said improvements; and first of that which relates to the action of the heddles H. I are two 80 spiral springs each fixed at a point in the center. To the end of these springs are attached cords or straps passing over eccentric pulleys and fastened to the top shafts of the heddles the spring I, thus 85 supporting one while the spring H, supports the other. J, J, represent the bottom shaft of one of the heddles pulled down by means of the straps K, K, which pass under the pulleys L, L, and are spliced together so as 90 to form one strap at M, whence it proceeds to the lever N, while similar straps proceed from the other heddle to the lever O, for there are similar straps of course attached to the lower shaft of both heddles. The 95 lever N, is here shown out or in action pulling the heddle G, down in consequence of which the spiral spring H, is open or on the stretch as here shown while the other lever O, being in the other spiral spring I, is 100 closed and has by its reaction drawn up the other heddle F, the levers N, O, are acted

upon by the tappets P, and Q, fixed upon the shaft R, which receives its motion in the ordinary way by means of spur gear from the main driving shaft S. I have colored
 5 the heddles and those parts which are immediately connected with the action of them blue in order to direct the eye more distinctly to them.

And now secondly of the improvement
 10 which relates to the picking motion T, and U, are two straps one leading from each picker and attached one to each of the vertical straps V, V, which I call the loop or bridle this bridle is fixed to the lay at the
 15 upper end and to a check string W, at the lower end this check string passes under the pulley X fastened to the floor and thence horizontally to the end of the swinging lever Y. This lever is acted upon by the
 20 cam Z, placed on the main driving shaft S, which cam works against a friction roller as here shown and it will be seen by this arrangement that at every vibration of the lever Y the check string W draws the two
 25 side lines of the bridle V into a right line and thus pulls the picking straps T, U, with sufficient force to drive the shuttle. The picking straps, bridle, pulley X, and cam Z, check string and swinging lever are all colored pink to point out their relative positions more distinctly and the swinging lever
 30 is furnished with a convolute spring at its upper end to assist its reaction as shown at Fig. 15, and colored yellow. *i, i* is a long wooden bar reaching all across the loom which I call the shuttle catcher bar this bar is fixed to the lay by hinges as shown at J, in Fig. 13, in full size K, is a spring to keep the bar up to its position against the lay L, is a
 40 round button of leather fixed on to the top of the bar shown also in Figs. 6, 7, and 8 and in fact to understand this part of the machinery well it will be better to have reference to all these figures while describing it for similar red letters are used to denote similar parts in them all. M, is a rod which I call the nipping rod descending from the shuttle catcher bar which has one of these rods at each end the lower extremity of this rod when the lay is drawn quite
 50 back is pressed strongly outward by coming in contact with the stud or knob N, which stud is fixed at a given point on the frame and thus causes the button L to nip the shuttle as it arrives at either end of the race board at the moment that the swell or middle of the shuttle has arrived at the button while the moving away of the lay to bring it up to the weft relieves the shuttle from the
 60 2d nip or pressure ready to be picked. O, is a horizontal rod which I call the stop rod. This rod is fixed to and projects from the front of the shuttle catcher bar L, and as the swell on the center of the shuttle gets to

the button L, it presses the top of the shuttle 65 catcher bar out from the lay and thus causes the stop rod O, to dip as shown by the dotted lines in Fig. 13. This dipping is just sufficient to prevent the stop rod O, from touching the end of the spring rod N, but if by
 70 any accident the shuttle should not go home then the stop rod O does not dip and therefore strikes against the spring rod N and pushes it forward to throw the driving pulley out of gear as will be more particularly explained hereafter. The relative positions
 75 of the stop rod O, the spring rod N, and the driving pulley are best shown at Fig. 8.

And now thirdly, of the improvements which relate to the action of the lay *a, a*, 80 are the two ends of the lay. The race board of this lay is made at an angle sloping toward the back of the loom and thus forming an acute angle with the back boards *b, b*, which in ordinary looms would be called the 85 back of the shuttle box but this slope of the race board renders the boards *b, b*, sufficient for the purpose of holding the shuttle in its place without anything more of a box provided the action of the button L, is properly arranged *d, d*, are bands fastened at
 90 one end to the lay firmly and passing over the pulleys *e, e*, in the breast beam proceed thence to the lever G at the upper part of which they are firmly attached. This lever 95 G vibrates on the fulcrum *h*, and is furnished with the friction roller *i* against which the cam or tappet J acts—this cam is fixed on the main driving shaft S—and is so formed at the part *k* as to cause a short pause of the 100 lay at that point where the greatest pressure is given to the weft the other parts of the cam being so shaped as to bring the lay gradually up to that pause and allow the spiral springs *l, l* fixed to the swords D D 105 to bring the lay smartly back ready for the next forward movement while a long pause takes place to give full time for the shuttle to pass the whole of the parts connected with the lay movement are colored green for 110 better distinction. A, is the driving pulley its pitch line only being shown so as not to interfere with the representation of the machinery behind it.

And now fourthly of the improvement 115 which relates to the giving off of the warp and the taking up of the cloth for the description of which it will be better to refer to Fig. 7 which is a side elevation of Fig. 6. A is the driving pulley. B, is the warp 120 beam and C, the cloth beam. *m* is a carrying roller the axis of which turns in fixed bearings, while the axis of the warp beam turns in bearings formed at the end of stout elastic spring supports as shown at *n*. 125 These spring supports have a fulcrum at *p* and an adjusting screw at *q* by which the warp beam may be taken farther from or

brought nearer to the framing of the machine in order to tighten or relieve at pleasure the metallic friction straps one of which is seen at *r* and which are fixed to the framing at each side of the machine and pass round the ends of the warp beam. The brown line denotes the line of passage of the warp and cloth from the warp beam to the cloth beam the axis of which latter beam turns in bearings on the ends of the balance levers at each side of the machine one of which is shown at *t* and receives its motion from the slipping strap *u* which comes from the warp beam. *x*, is one of the balance weights of the balance levers to increase at pleasure the tension of the band *u*. By this arrangement and the particular position and form of the spring support *n* it will be seen that first in proportion as the warp on the warp beam B diminishes in circumference the angle formed by the thread in its passage over the carrying roller *m* from the warp beam varies in such manner with reference to the support *n* as to cause the same to yield more readily as the power of the thread to move it becomes weaker from the diminished diameter of the roll and secondly that the greater the weight *x*, placed upon the balance lever *t*, the greater will be the power of the slipping bands *u* to cause the cloth beam C, to take up while the warp beam B, will not be thereby affected in its power of giving off all the parts connected with these last described movements are colored purple. Fig. 8 is a plan of part of Fig. 6, and shows the spring shuttle catcher bar hereinbefore alluded to which holds the shuttle when at either end of the lay. A, is the driving pulley.

And now fifthly of the said improved driving pulley. In Fig. 6 the position of the driving pulley is only shown by pitch-line as a more detailed view in that figure would have prevented the tappets from being seen but at Figs. 16 and 17 it is shown separately and of half size, Fig. 17 being a front view and Fig. 16 a side section of the pulley—the part colored green in this figure is the eccentric or cam fitted on the main working shaft and furnished with the pin or stud 6. *a h* is a lever turning on the fulcrum *r* and *f d* is a lever turning on the fulcrum *e*. These two levers are pressed upon by the horseshoe spring S which is connected to both—the lever *a h* resists the motion of the spring by coming against the stud *t* and the lever *f d* by coming against the end of the lever *a h*. Now supposing the pulley to be brought round till the notch at *a* holds on the stud *b*—then the pulley drives or is fast, but if from the shuttle not going home the spring rod *n* is forced forward so as to depress the tail end *h* of the lever *a h* as the pulley goes round it forces

it from the stud *b* and the pulley is thrown out of gear from the working shaft immediately at *f* is a secondary catch on the end of the lever *f d* which receives the catch *a* when lifted up from the stud *b* and thus keeps it free when once it is so. When required to put the pulley in gear again the catch at *f* must be freed from the lever *a h* by depressing the handle *g*. It will be observed that the lever *f d* is on one side of the driving pulley and the handle *g* on the other. Fig. 16 is the side section of the driving pulley A and the cam J, showing the spring rod *n* which is pushed forward by the stop rod on the shuttle catcher bar when the shuttle from any accident does not go quite home as hereinbefore described.

And now lastly, of the improvement which relates to the form of shuttle which is shown at Figs. 9, 10 and 11, 9 being a back view of the shuttle, 10 a plan or birds eye view of it laid in the position for work and 11 a transverse section of it through the middle. It will be observed that this shuttle is much broader than the ordinary one now in use and that the side next the reed of the lay is a straight edge except at the extreme ends where it draws off a little from the reed and a cavity Z Z is formed on the under side of each end to receive the picker which is shown in perspective at Fig. 12 and in its groove at the end of the lay which is shown in section at Fig. 13 as also in the plan at Fig. 8. It will be observed that by striking in the recesses or cavities Z Z instead of at the point of the shuttle a square flat surface is presented to the end of the picker which is made to correspond in shape with that surface and thus causes it to give a fairer blow while it is much more durable than those now in use.

I hereby declare that the certain fabrics hereinbefore alluded to are all such fabrics as are usually woven by hand and power looms and that I hereby claim as the said invention in respect thereof:—

1. The mode of actuating the heddles by levers and horizontal bands passing under pulleys, and springs as hereinbefore described and colored blue. 115

2. The arrangement of the picking straps with the loop or bridle V V, and horizontal check string W, leading to the spring lever Y and colored pink as also the shuttle catcher bar *i*, with its stop and spring rod. 120

3. The mode of actuating the lay by means of a cam or tappet hereinbefore described together with the straps *e e* and their guide pulleys as also the spiral springs L L, attached to the sword for the purpose of drawing back the lay also hereinbefore described and colored green. 125

4. The arrangement of machinery here-

inbefore described by which the giving out of the warp and taking up of the cloth is effected and regulated and colored purple.

5 5. The improved driving pulley hereinbefore described and which when the loom is turned by hand may be made to act as a fly wheel.

6. The form of shuttle with the cavities Z Z hereinbefore described and of the picker to be used therewith.

CHRISTIAN WILHELM SCHÖNHERR.

Witnesses:

DAMON STAMFITO,
JAMES BISCHOFF.