

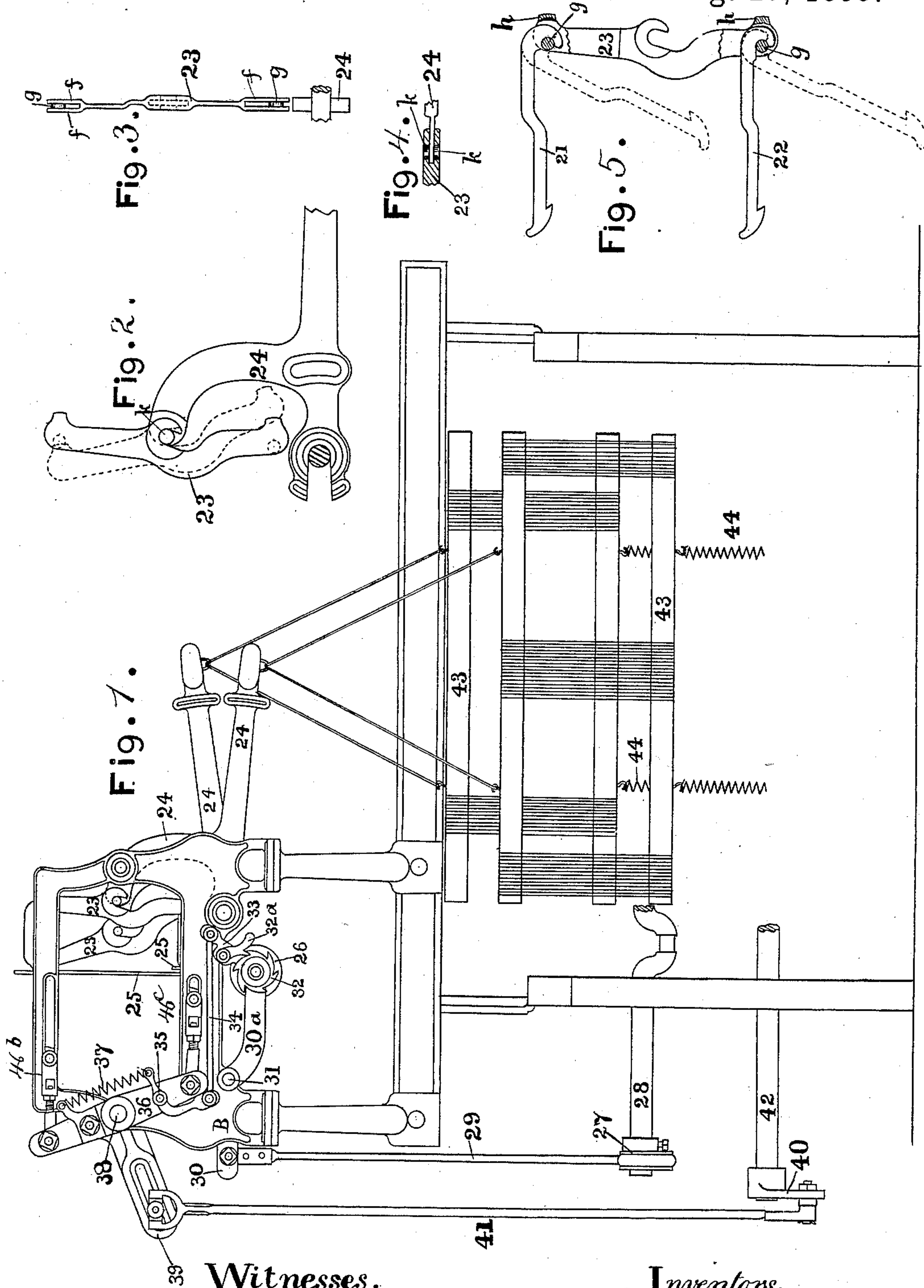
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4 Sheets—Sheet 1.

R. L. HATTERSLEY & J. HILL.
SHEDDING MECHANISM FOR LOOMS.

No. 409,787.

Patented Aug. 27, 1889.



Witnesses.

Samuel Hey
J. E. Hession

Inventors.
R. L. Hattersley
James Hill

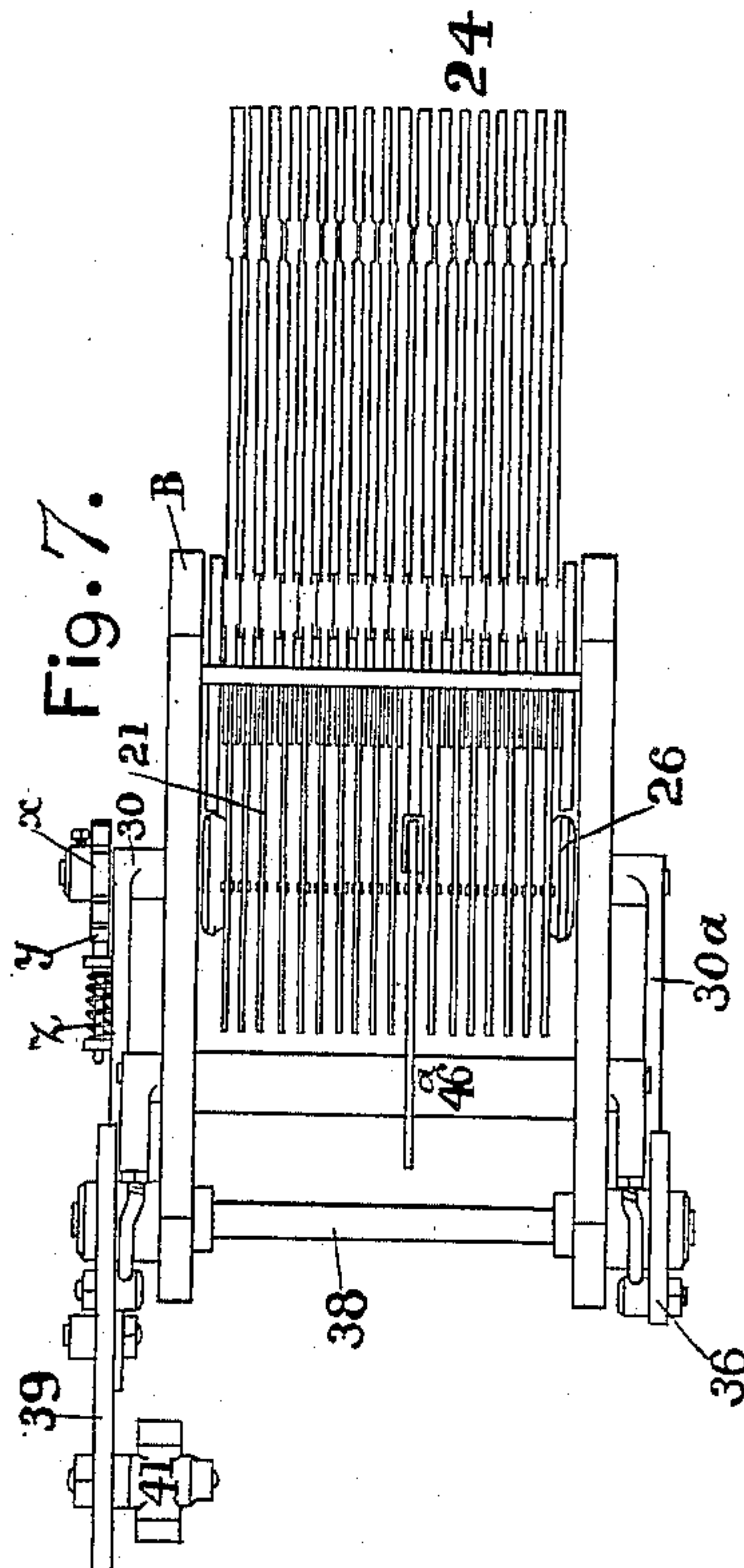
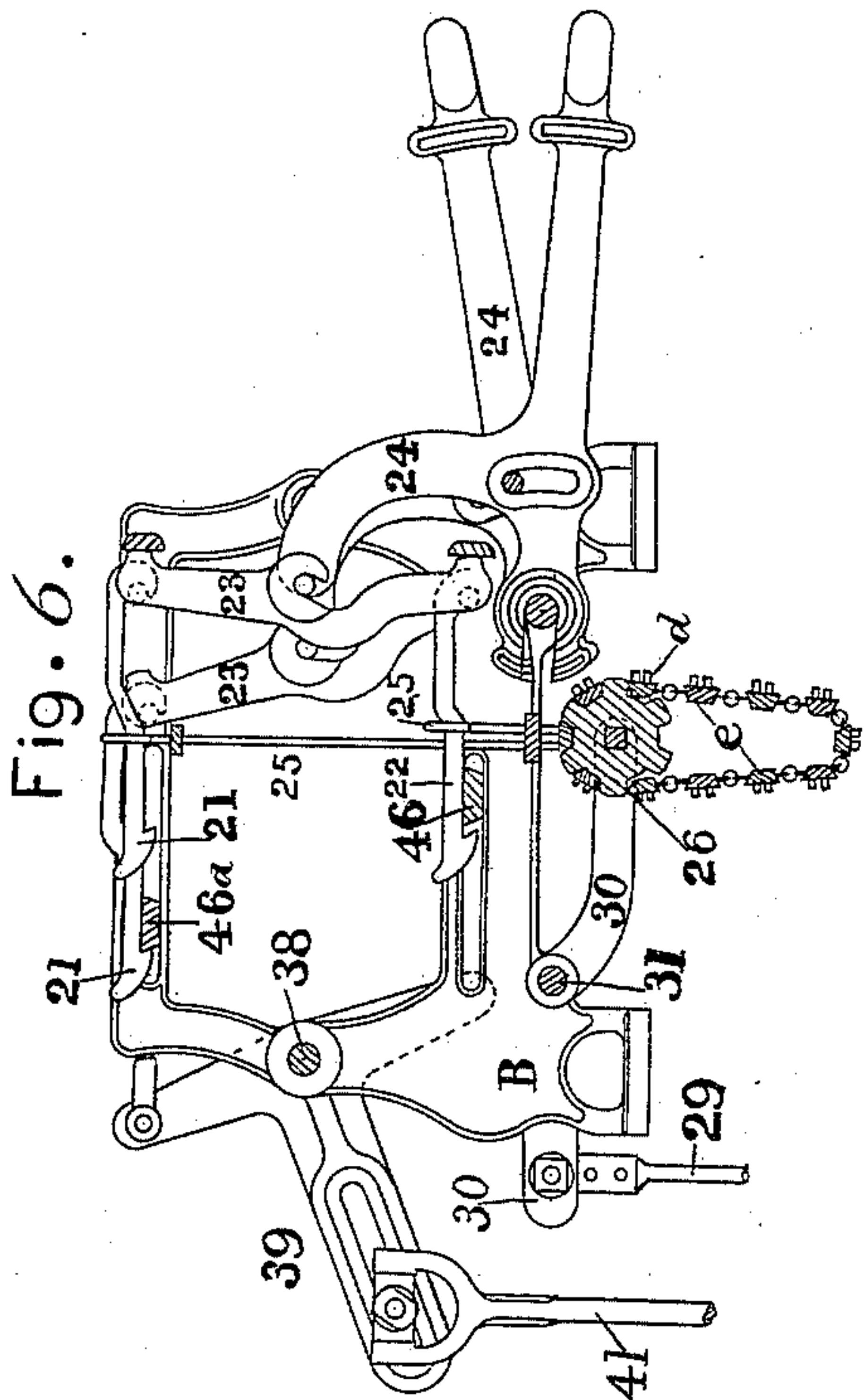
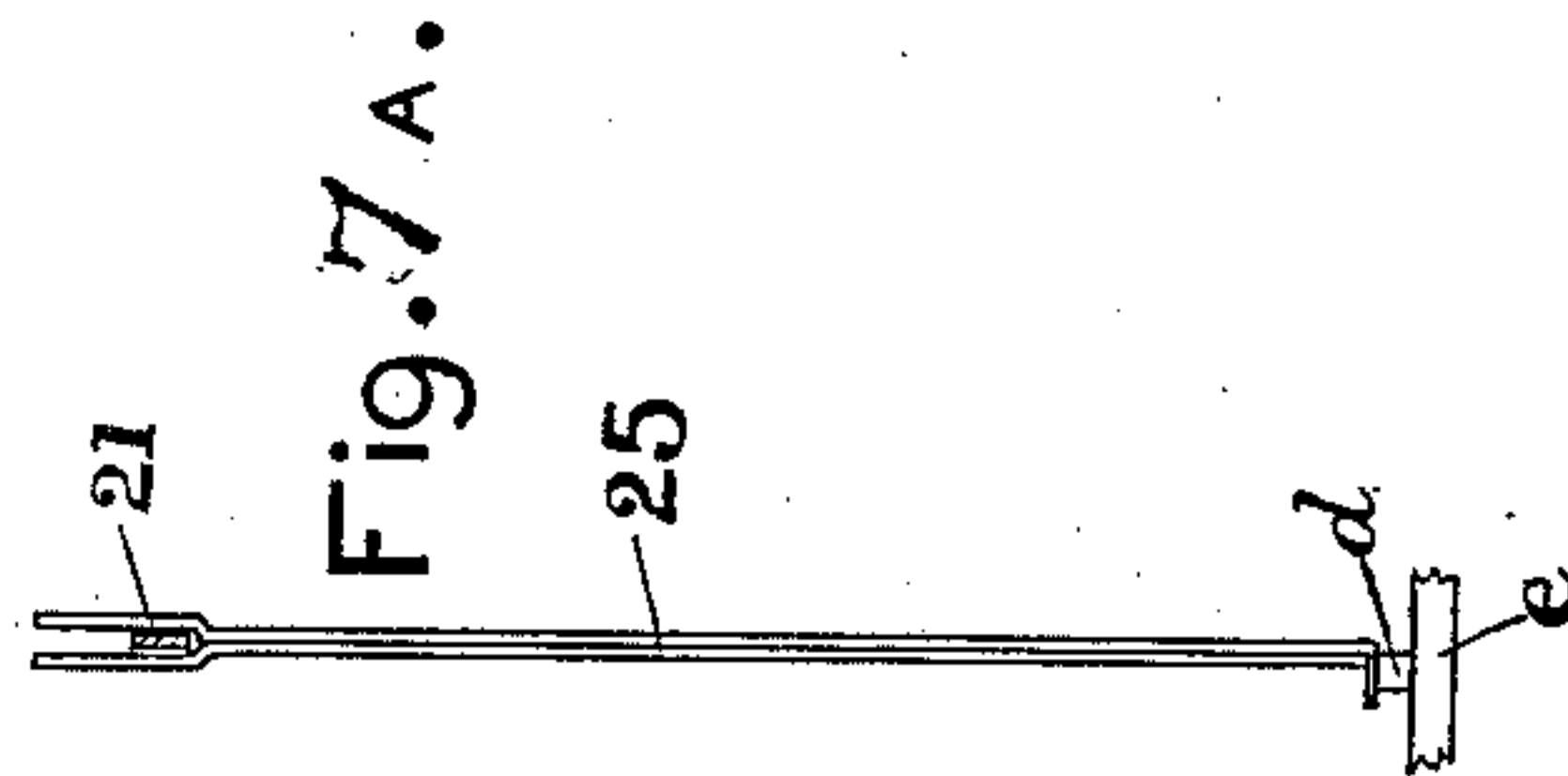
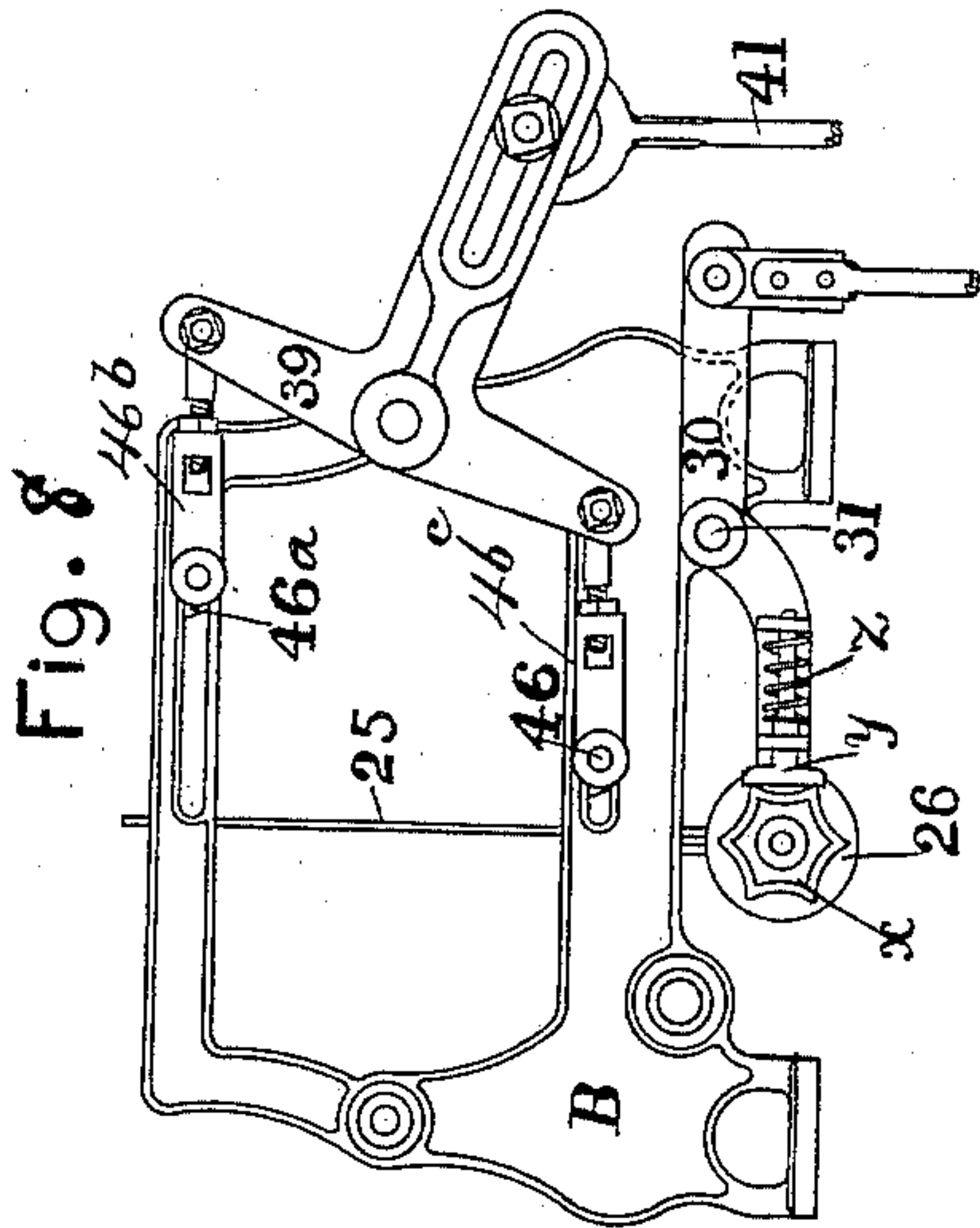
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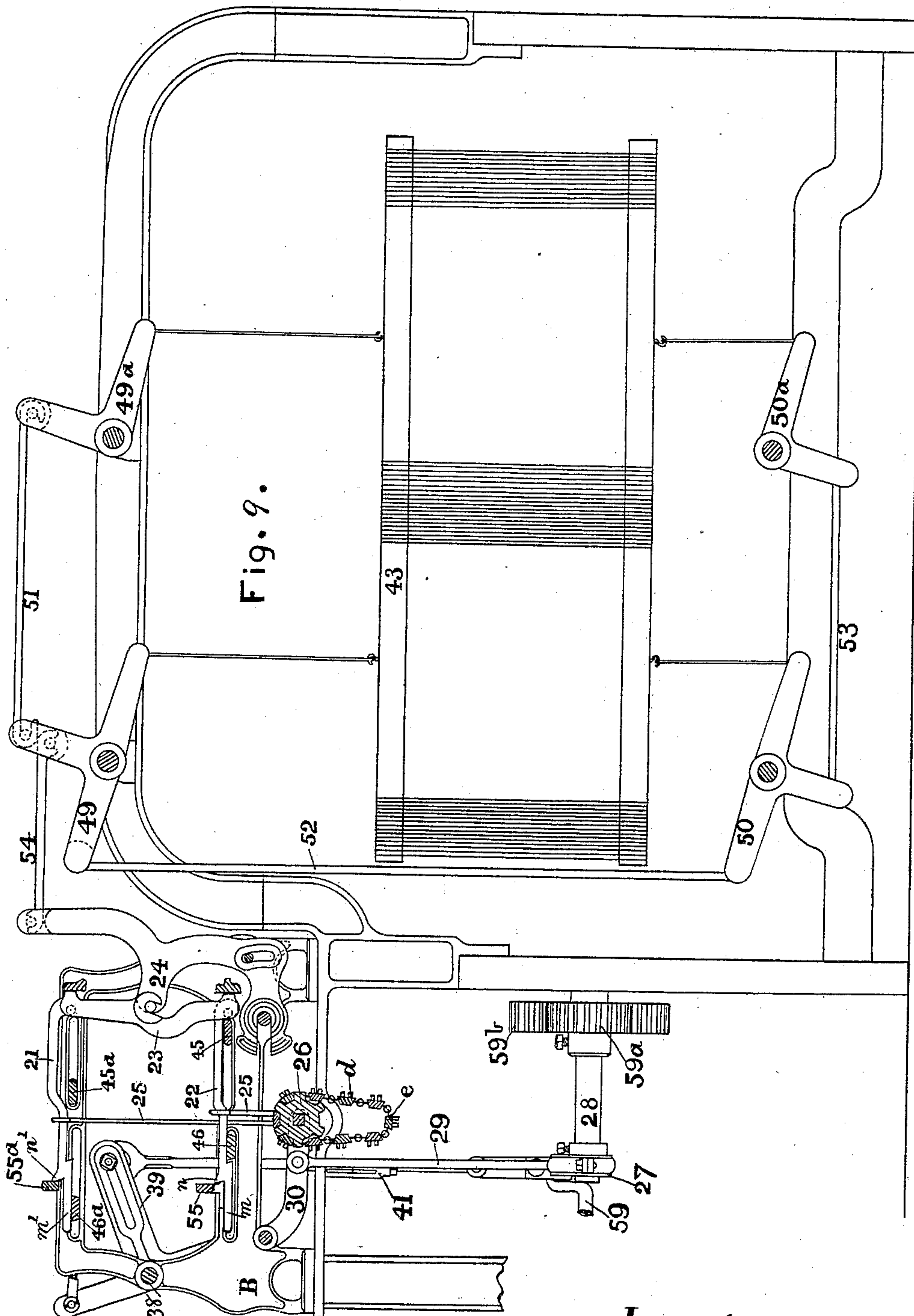


Fig. 9.

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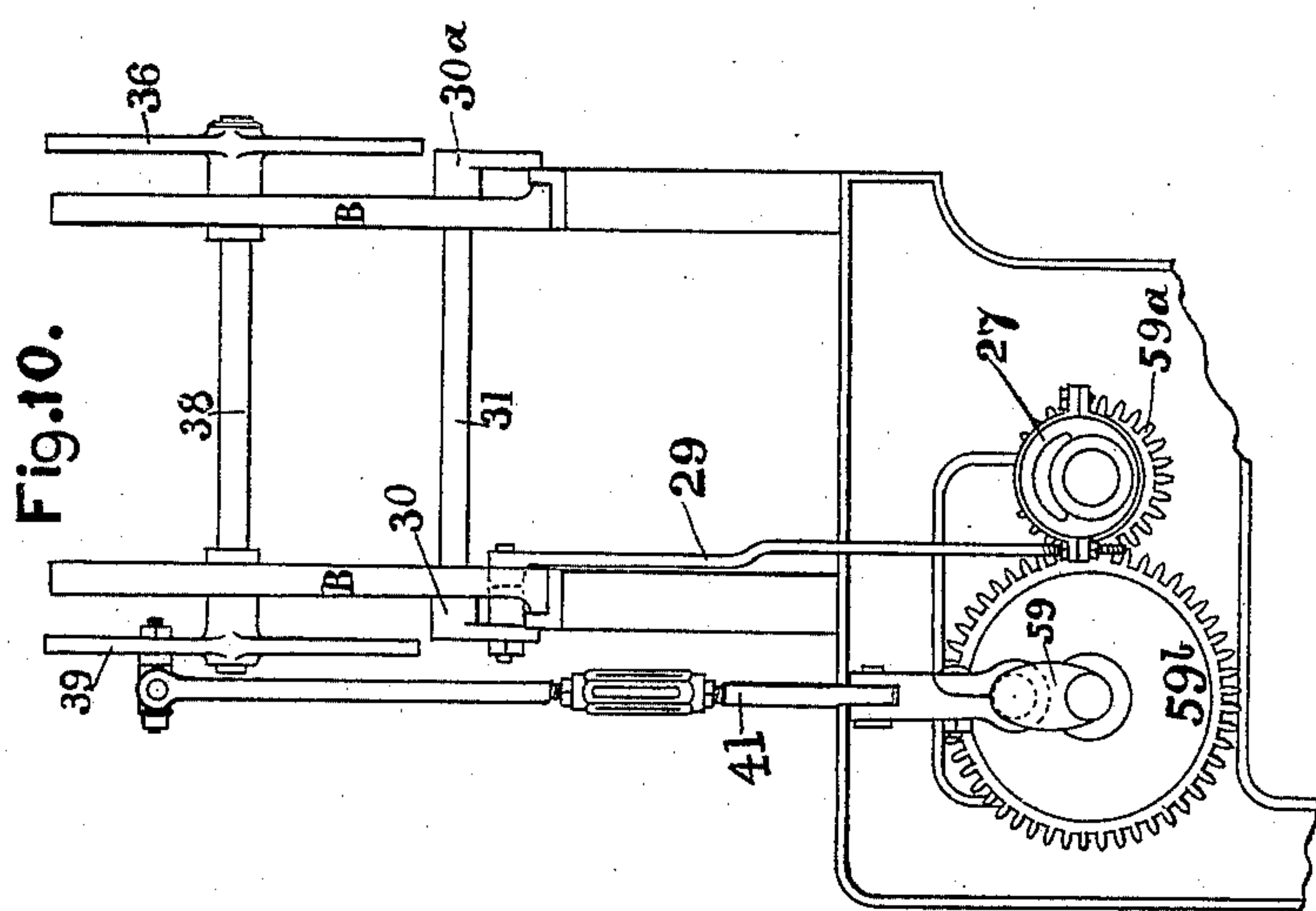
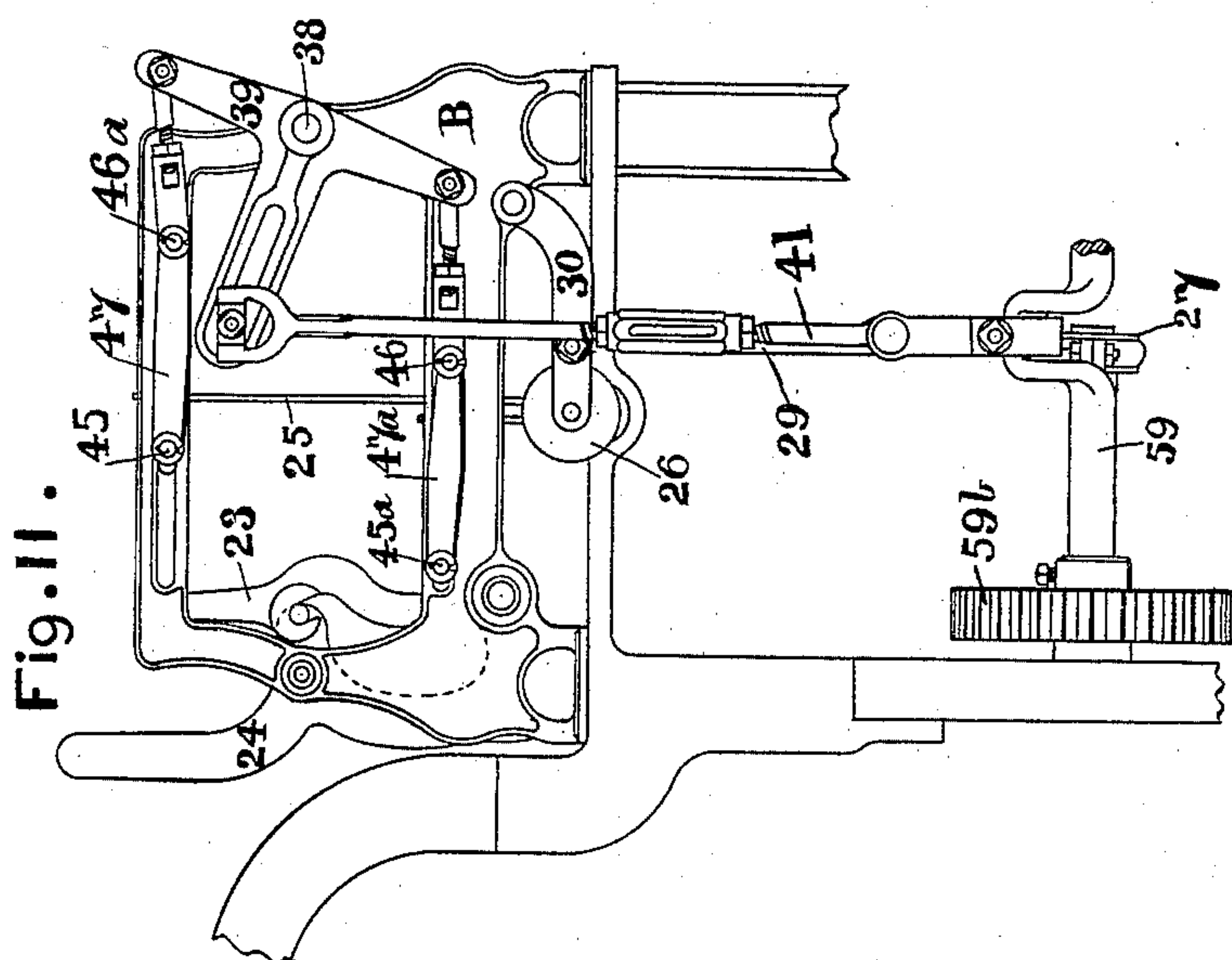
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UNITED STATES PATENT OFFICE.

RICHARD L. HATTERSLEY AND JAMES HILL, OF KEIGHLEY, COUNTY OF YORK, ENGLAND.

SHEDDING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 409,787, dated August 27, 1889.

Application filed May 4, 1887. Serial No. 237,022. (No model.) Patented in England February 9, 1887, No. 2,018.

To all whom it may concern:

Be it known that we, RICHARD LONGDEN HATTERSLEY and JAMES HILL, subjects of the Queen of Great Britain, residing at Keighley, in the county of York, England, have invented certain new and useful Improvements in Shedding Mechanisms for Looms, (for which we have obtained Letters Patent in England, bearing date February 9, 1887, No. 2,018,) of which the following is a specification.

This invention has for its object the production of simple and inexpensive yet efficient shedding or heald-operating mechanisms for looms, we attaining the said object by the novel combination and construction of parts forming the same, hereinafter fully set forth, and particularly pointed out in the claims.

In the following description reference is made by figures and letters to the accompanying sheets of drawings, Figure 1 in which is a front elevation showing the heald-operating or shedding mechanism applied to a loom. Figs. 2, 3, 4, and 5 are detail drawings, on an enlarged scale, of parts of the shedding mechanism hereinafter referred to. Fig. 6 is a sectional elevation of part of Fig. 1. Fig. 7 is a top view of the parts shown in Fig. 6. Fig. 7^a is a detail view. Fig. 8 is a back elevation of a portion of the parts shown in Fig. 6. Fig. 9 is a sectional front elevation illustrating the shedding mechanism applied to a loom for operating the healds "positively" in both directions, or for lifting as well as depressing them. Fig. 10 is an end elevation showing the method of imparting motion to the shedding mechanism illustrated by Fig. 9. Fig. 11 is a back elevation of the part shown in Fig. 9.

This invention has reference to that class of shedding mechanism well known in England as "Hattersley's dobby," the same being an improvement for certain purposes upon the invention described in the specification of our Patent No. 383,465, and in accordance with this said invention the construction and arrangement of the parts employed are of such a nature that without increasing the space occupied laterally by the jack-levers therein employed more space is allowed for the pegs of the peg-lag mechanism. This is attained by making the catches 21 22, (see Figs. 4 and 5,) which

are pivoted to the swing-levers 23, said levers 23 being hinged or pivoted on the harness-operating or jack levers 24 of a suitably-bended shape, (for the purpose hereinafter described,) and forming the needles 25, through which the said catches 21 22 are operated by the hereinbefore-named peg-lag mechanism, of strips of metal shaped at their upper ends to span said catches so as to form grates or grids for them to work in, (see Fig. 7^a;) and also turning or bending the bottom ends of these needles 25 a suitable distance to one side, thus forming a greater surface for the pegs *d* of the peg-lag mechanism to act upon.

The pattern mechanism consists of the well-known peg-lag cylinder 26, to which is imparted rising and falling motion by the eccentric 27, mounted on the top or crank shaft 28 of the loom, the rod 29, in connection with said eccentric, and the levers 30 and 30^a, fixed on the shaft 31, said shaft being loosely carried by the frame-work B, and said levers 30 and 30^a, carrying the said cylinder 26. To said cylinder 26 is also imparted intermittent rotary motion by the ratchet-wheel 32, fixed on the shaft of cylinder 26, said wheel being operated by the pawl 32^a, pivoted on the lever 33, joined by rod 34 to lever 35, pivoted on the lever 36, said lever 35 being held against the lever 36, as shown by Fig. 1, by the spring 37, which arrangement is to prevent any breakages by said spring yielding should the cylinder 26 be hindered from being turned or revolved by the lags wrapping around the same or any other cause. The said lever 36 has oscillatory motion imparted to it by being mounted rigidly on the shaft 38, to which is attached the lever 39, said shaft 38 being mounted loosely in framing B, and the lever 39 is coupled to the swape 40 by the rod 41, said swape 40 being rigidly fixed to the bottom or low shaft 42 of the loom, as will be well understood.

From the shaft 38 reciprocatory motion is imparted to the draw-bars 46 and 46^a by means of the levers 36 and 39, mounted on said shaft 38 and coupled to said bars 46 and 46^a by the rods 46^b and 46^c, respectively.

Since the pattern-cylinder 26 is arranged to press the pegs *d* of the peg-lags *e* (see Fig. 6) directly against the ends of the needles 25 without the use of the intermediate levers heretofore employed, and the catches 21 and

22, with which they work in contact, are made in a bended or cranked form, or, in other words, are formed so that the outer portions of their body parts shall not be in the same horizontal planes as are the portions reaching up to the jointings of the same to the lever 23, but so that these said outer portions (when the catches 21 and 22 are in their working positions or somewhat horizontal, as illustrated by Fig. 5) shall be in a lower plane, we are enabled to place two rows of indicating-pegs on each lag *e*, one to operate one series of catches that may have their outer portions in proper position, while the other operates the other series of catches, when the former are drawn, so that by their bended or cranked form their needles may be lifted without operating them, (catch 21 that is shown in actual contact with bar 46^a, Fig. 6, is in this position,) in this manner only requiring the pattern-cylinder 26 to be rotated or turned once for every two changes in the movements of the healds 43 through the jack-levers 24, although its rising and falling movement is repeated for every separate movement of said healds 43.

If the catches 21 and 22 were not of the bended or cranked form, as above described, when the pattern-cylinder 26 was repeating its vertical movement for the purpose of again operating said catches 21 and 22 immediately after said cylinder 26 had been rotated, those of said catches which were in actual operation by being in connection with their draw-bar 46 or 46^a, and which were required to be lifted out of such connection, would be thus lifted before their previous operation was intended to terminate, and so the work being performed would be damaged; or if these catches could not be so lifted, then some breakage in the motor parts would ensue. By being enabled, through the peculiarities in the construction and arrangements of the several parts above described, to place two rows of pegs *d* upon each lag *e*, (see Fig. 6,) the same being made to operate directly upon the two series of needles 25, which are in two distinct vertical planes at right angles to the vertical planes in which are the two series of catches 21 22, in contradistinction to the relative positions of said series of catches 21 22 and the well-known series of intervening levers—such as the levers 77 in our specification of Patent No. 383,465—between the same and the pegs that operate them, (said series of intervening levers being in the same planes as are their respective series of catches,) more space laterally (relatively with the catches 21 22, but longitudinally if relatively with the lag *e*) is allowed for each of said pegs *d*, since in the former case we may make each of said pegs *d* to occupy more space than the distance that exists between any two of the adjoining pegs in the opposite series, while in the latter it is necessary to make them occupy slightly less than this said space, (the space between the two pegs in the opposite series,) otherwise each of them would

also (in addition) operate the two intervening levers adjoining the one of said levers it was desired to operate. To adjust and retain in position the cylinder 26 after each rotating movement above described, the usual star-wheel *x* with the sliding piece *y* and the spring *z* are employed, the same being common and well understood.

The foregoing is a description of the parts that form what is well known as a “non-positive dobby”—that is, of operating mechanism which effects only one movement of the healds, relying on the action of springs or weights for the return movement. Fig. 1 shows this mechanism arranged for raising the healds, while the springs 44 are for depressing the same. Again, as indicated in the modified arrangement shown in Figs. 9, 10, and 11, by the catches 21 22 being of a bended or cranked shape, as above described, space is allowed for the operation of an extra reciprocating push-bar 45 45^a beneath each series of catches, these said push-bars 45 and 45^a (which obtain their motion by being coupled, as shown in Figs. 9 and 11, by the rods 47 47^a to the draw-bars 46 46^a) being made to press the levers 23 back in the opposite direction to that moved by them when drawn by bars 46 and 46^a engaging with their said catches 21 22. In the said modification the catches 21 22 are operated or drawn by the draw-bars 46 and 46^a, which are operated by the levers 36 and 39 and shaft 38, the same obtaining their motion from the crank 59 through the rod 41. Said crank 59 is driven by the gears 59^a and 59^b from the loom's crank 28, in this manner imparting motion in either direction according to the direction of rotation of the crank 28. The arrangement of heald-operating connections shown in the said figures is well known to those conversant with this class of machinery as a “positive motion,” it comprising the levers 23 and jack-levers 24, connecting-rods 54, the levers 49 49^a and their connecting-rods 51, the levers 50 50^a and their connecting-rods 52 and 53, all being substantially such as specified in our Letters Patent hereinbefore referred to; but to insure the effectual operation of the catches 21 and 22 in connection with this positive-motion arrangement their outward ends *m m'* are elongated, so that when the pattern-cylinder 26 has lowered or moved from supporting them by their needles 25 for the purpose of being rotated by this elongated part *m* or *m'* resting on the draw-bar 46 or 46^a, the upper edges of said catches 21 and 22, on which are formed other catches *n n'*, are kept in contact with the stop-bar 55 or 55^a for purposes well known, the same being particularly described in our specification No. 383,465, referred to above.

The jointings of the catches 21 22 to their swing-levers 23, hereinbefore named, as well as the jointings of the said swing-levers 23 to their respective jack-levers 24, are so constructed that, though when moved into cer-

tain relative positions, they may be detached from each other when they are in position for working, as above described, they may be pushed or pulled as required without being disunited.

Relative to the jointing of the catch 21 or 22 to its lever 23 this is accomplished by forming each end of said lever 23 somewhat of a forked shape, between the two prongs *f* of which is mounted in a suitable position a pin *g*, and by joining these two prongs together by means of the part *h*, (see Fig. 5,) so that when the catch 21 or 22 is brought with its end, which is of a suitably-hooked shape to fit over pin *g*, into connection with this pin *g*, the said part *h* that joins the prongs together will keep said hook in proper connection when in its working position. However, by moving said catch 21 or 22 when so coupled so that it is brought parallel or about parallel with its lever 23, as shown in dotted lines in Fig. 9, it will be free of both the pin *g* and the joining-piece *h*, and so may be detached.

Respecting the jointing of the lever 23 to the jack-lever 24 the outer end of said jack-lever 24 is made of a suitable thickness and has formed on each side of it a small projection *k k*. (See Fig. 8.) The swing-lever 23 has formed at or about its center part a hook *l*, which is split so as to span the end of said jack-lever 24 as well as lay hold of the projections *k* on each side of it. The said hooked part of the swing-lever 23 is for the purpose of operating (as drawing or raising) the jack-lever 24 in one direction, while by the end of said jack-lever 24 abutting against the said swing-lever 23 (being kept in that position by the hooks spanning the same, as above described,) the return-movement of said jack-lever 24 may be or is (as when the push-bars 45 45^a are employed) effected. The said swing-lever 23 is also bent or cranked between its center part and one of its outer ends, so that its bifurcated hook *l* may be made to be detachable from the projections *k k*, attached to the bent arm of the lever 24, when said lever 23 is held in a suitable position relative with the lever 24, as is shown by broken lines in Fig. 2. However, when said lever 23 is partly rotated about said projections *k k* and is moved into the position shown by full lines in Fig. 2, which is its proper working position, its bifurcated hook *l* lays hold of said projections *k k* securely, and while said levers 23 and 24 are in these relative positions one cannot be separated from the other. When the catches 21 and 22, swing-levers 23, and jack-lever 24 are constructed so that they may be joined together, as above described, no additional parts are required to secure the effectual operations of these jointings, nor is any one of these parts required to be of any different material to ordinary cast-iron, since the peculiarities of said joints allow the addition of an extra amount or bulk of metal to these particular parts in contradistinction to the several other styles of jointings hereto-

fore employed, wherein either extra pieces are required or certain parts (as, say the catches 21 and 22) must necessarily be made of malleable iron.

Having now fully explained our invention and described the operation thereof, what we claim is—

1. The pattern-cylinder 26, the levers 30 and 30^a, shaft 31, rod 29, eccentric 27, the motor-shaft 28, peg-lags *e*, each lag having two rows of pegs *d*, the needles 25, bars 46 and 46^a, means for operating said bars 46 and 46^a, catches 21 and 22 of bended or cranked form about midway between their extreme ends, levers 23 and 24, and healds 43, all in combination, each part being arranged to operate in connection with the other parts, substantially as specified.

2. The needles 25, constructed with their upper ends open to span the catches and their lower ends bent to form greater surfaces for pegs to operate upon, the pattern-chain *e*, and pegs *d*, means for operating said pattern-chain *e*, the catches 21 and 22, the draw-bars 46 and 46^a and their actuating devices, and levers 23 and 24, in combination, all being arranged to operate substantially as specified.

3. The catches 21 and 22, having elongated ends *m* and *m'* and catches *n* and *n'*, respectively, also being of bended form and having their other ends respectively terminating in hooks, the needles 25, the pattern-chain *e*, and pegs *d*, means for operating said pattern-chain *e*, the bars 46 and 46^a, means for operating these bars, the stop-rails 55 and 55^a, the levers 23, the outer ends of which are formed with the prongs *f*, pins *g*, and pieces *h* to retain the hooked ends of catches 21 and 22 when in one position, but to allow them to be detachable in another, the reciprocating bars 45 and 45^a, means for operating said bars 45 and 45^a, the levers 24, the healds 43, and the means for joining said levers 24 to said healds 43, by which said healds are raised and depressed without the aid of springs or weights, substantially as specified.

4. The bars 46 and 46^a, means for operating them, the rods 47 and 47^a and the bars 45 and 45^a, 55 and 55^a, the catches 21 and 22, having ends *m* and *m'* and catches *n* and *n'*, and the levers 23, combined with the levers 24, said levers 23 being constructed to lay hold of the pins *k k*, formed or attached to the levers 24 and also being of bended form, so as to lay securely hold of the pins *k* on the levers 24 when in one position, in which position the ends of the levers 24 may abut against said levers 23, but be detachable when moved into another position, the healds 43, and the means for joining said healds to said levers 24, substantially as specified.

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