

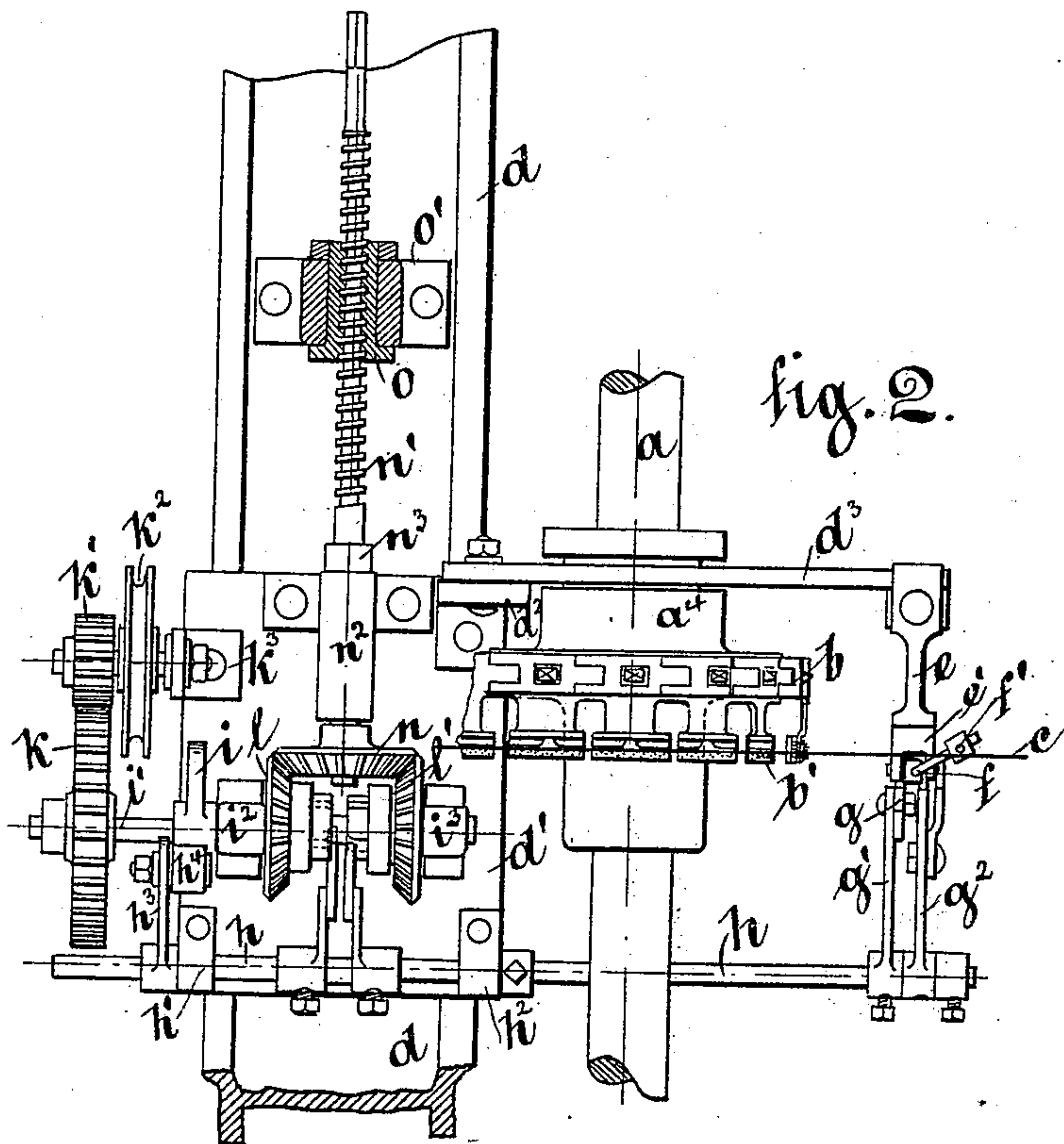
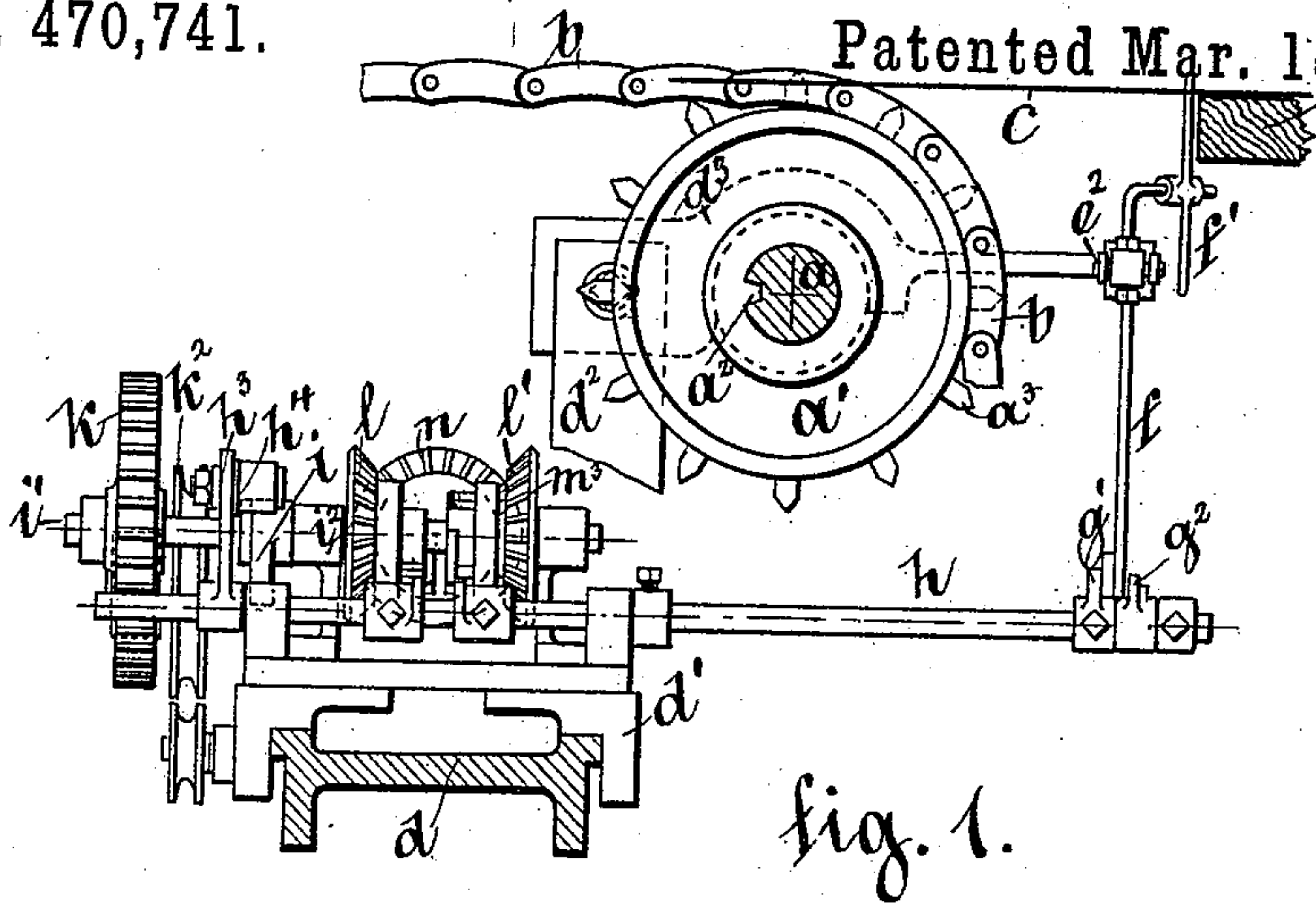
(No Model.)

2 Sheets—Sheet 1.

A. BRADBURY.
CLOTH TENTERING MACHINE.

No. 470,741.

Patented Mar. 15, 1892.



Witnesses
W. H. Countland
Nellie L. Rope

Inventor
ALFRED BRADBURY
BY HIS ATTORNEY

Edward P. Thompson

(No Model.)

2 Sheets—Sheet 2.

A. BRADBURY.
CLOTH TENTERING MACHINE.

No. 470,741.

Patented Mar. 15, 1892.

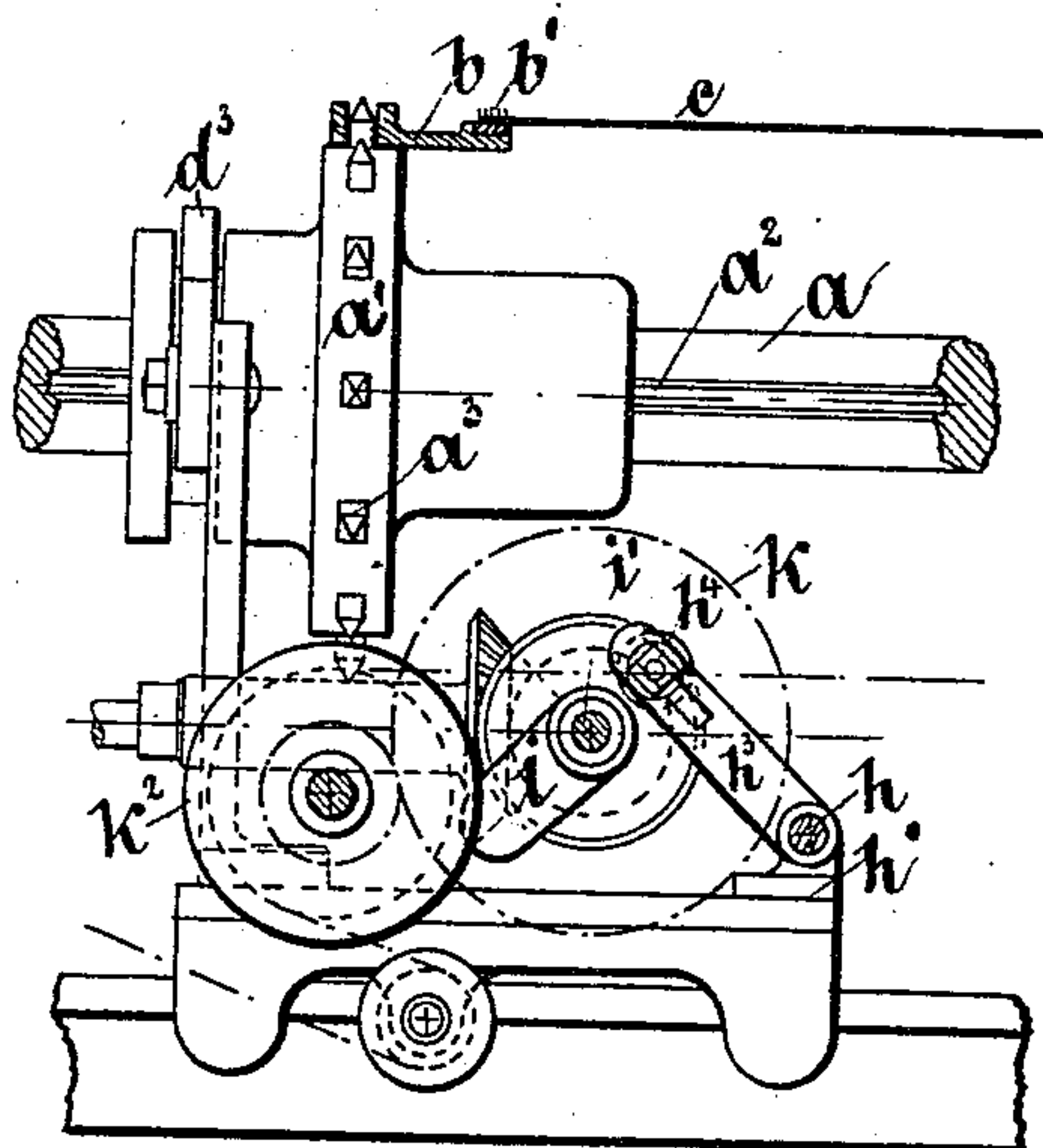


fig. 3.

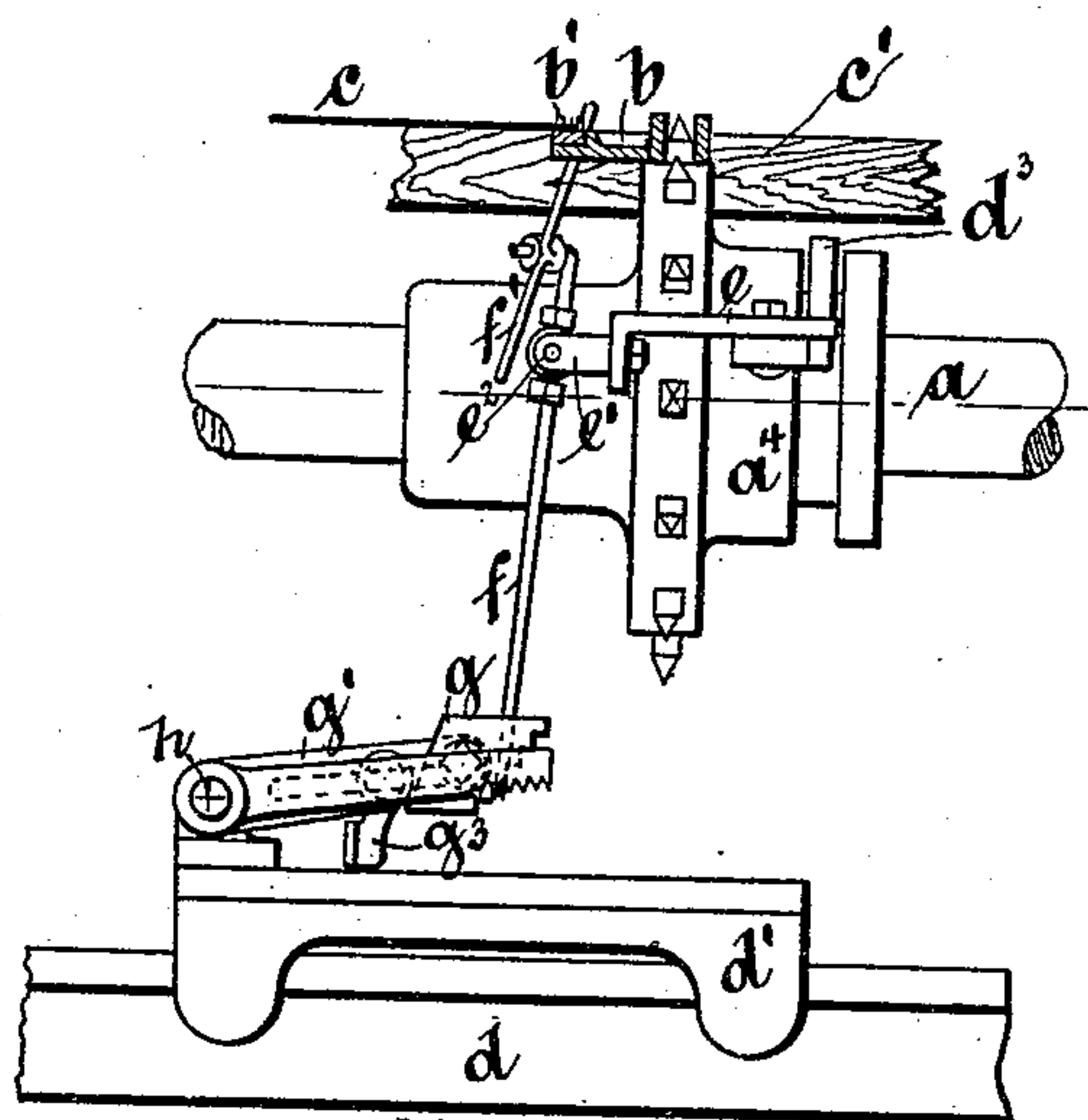


fig. 4.

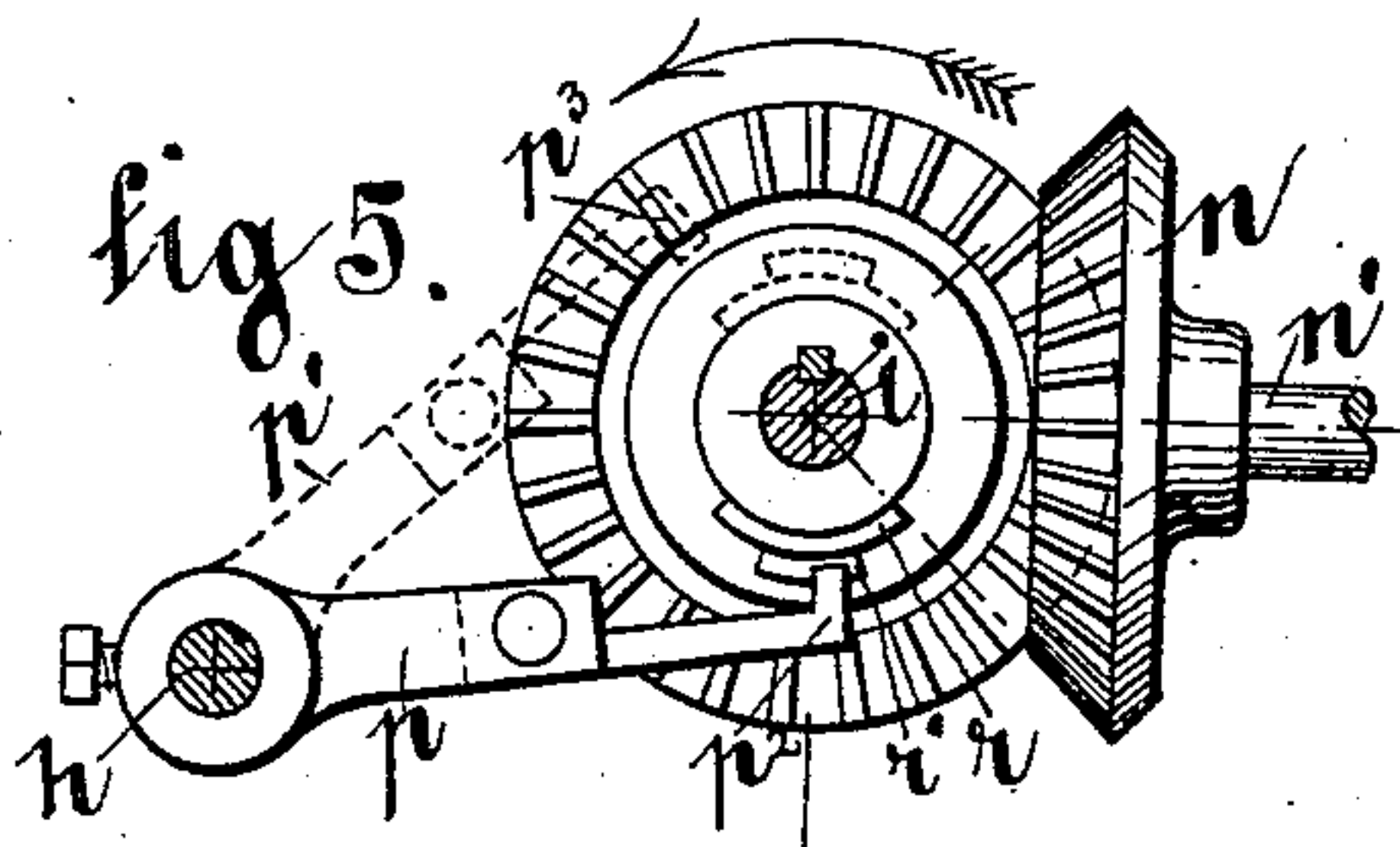


fig. 5.

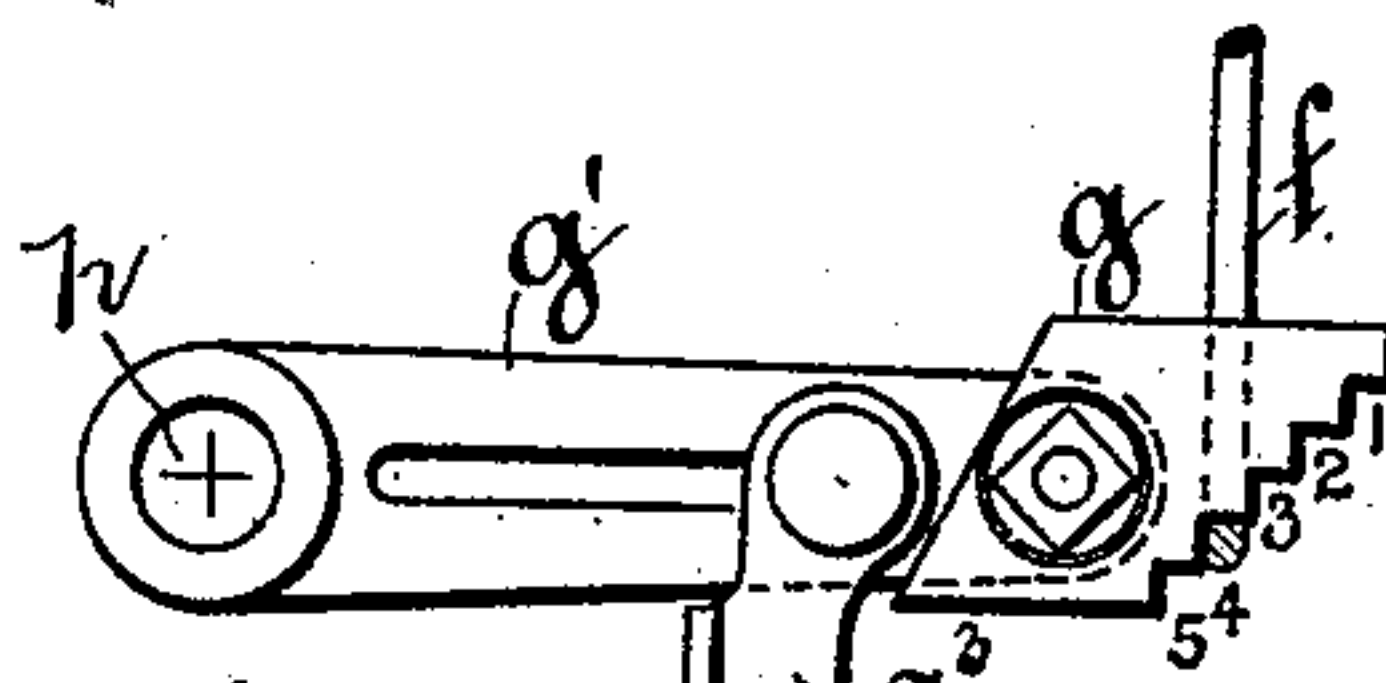


fig. 7.

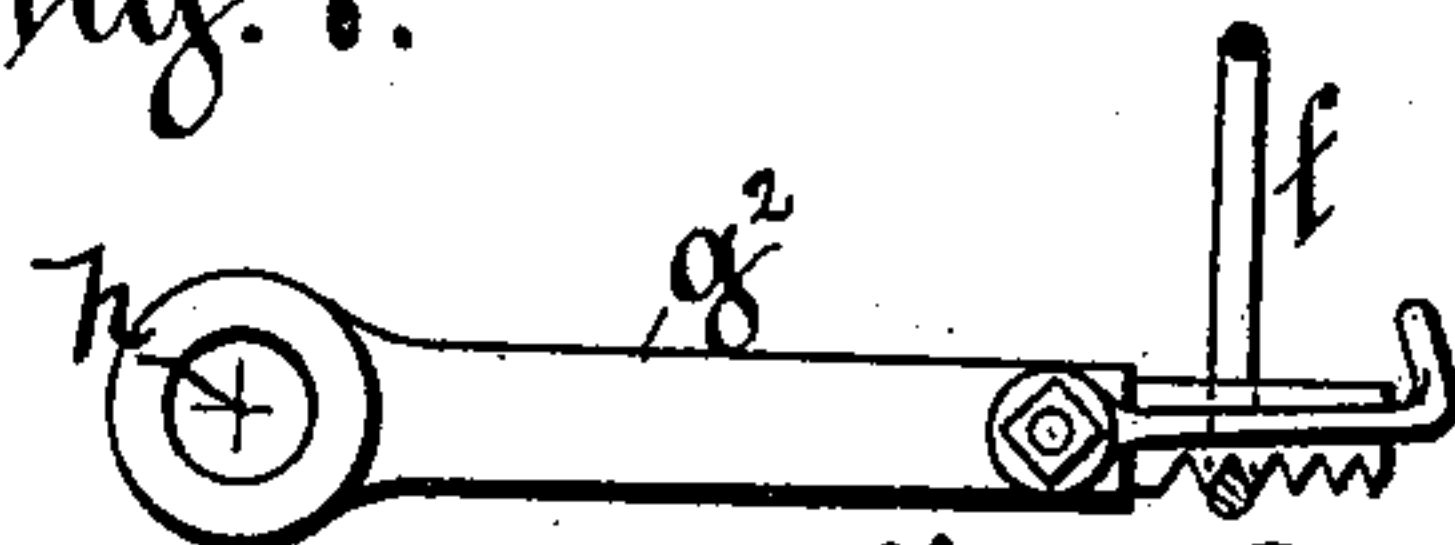


fig. 8.

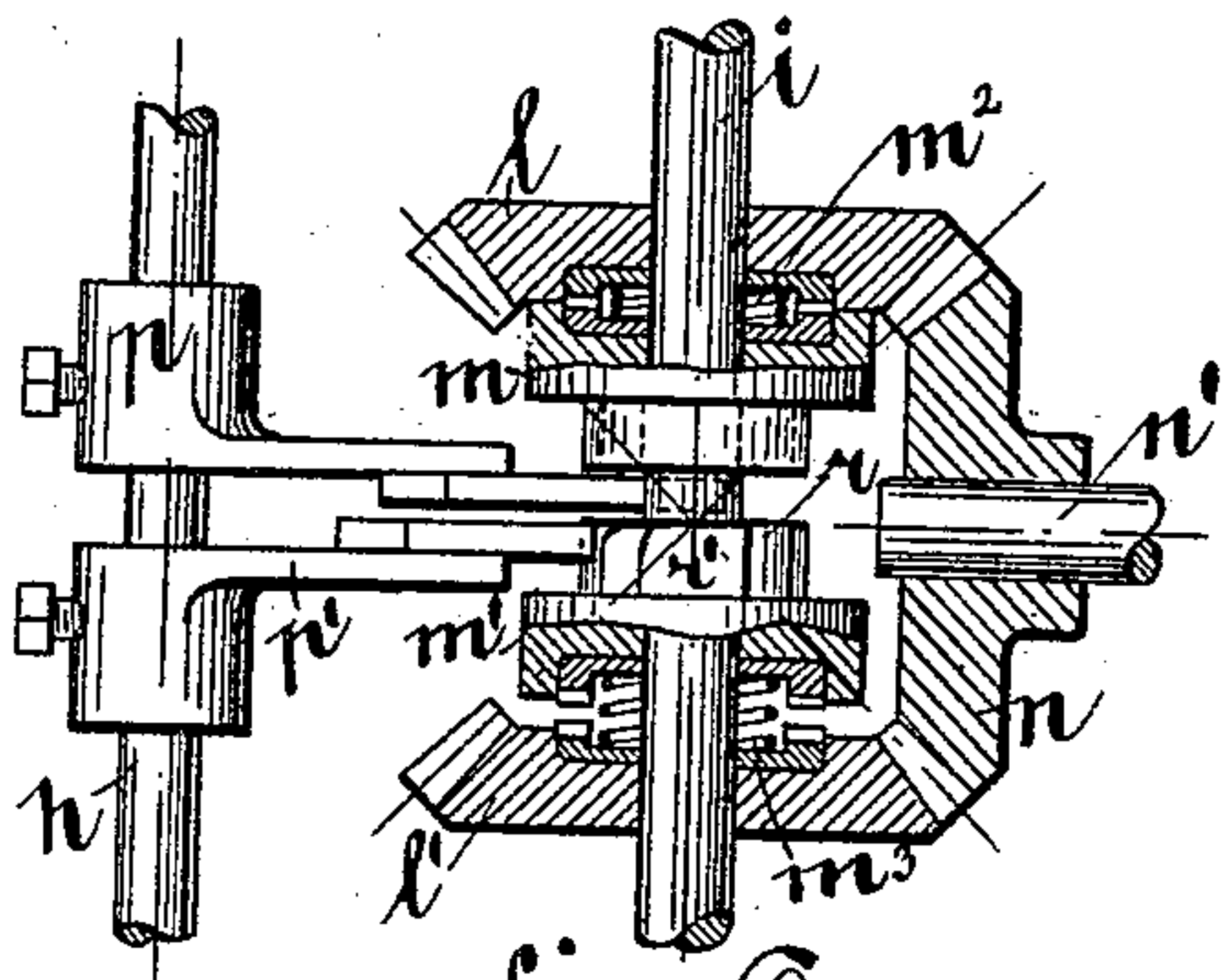


fig. 6.

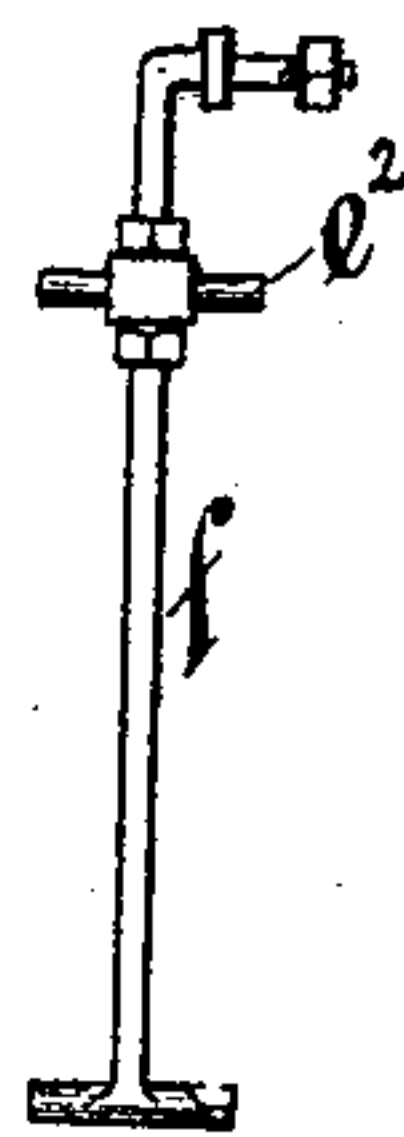


fig. 9.



fig. 10.

Witnesses
W. H. Coutland
H. L. Pope

Inventor
ALFRED BRADBURY
BY HIS ATTORNEY
Edward P. Thompson

UNITED STATES PATENT OFFICE.

ALFRED BRADBURY, OF GREENFIELD, ENGLAND.

CLOTH-TENTERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 470,741, dated March 15, 1892.

Application filed June 4, 1891. Serial No. 395,048. (No model.)

To all whom it may concern:

Be it known that I, ALFRED BRADBURY, a subject of the Queen of Great Britain, residing at Greenfield, in the county of Lancaster, in the Kingdom of Great Britain, have invented certain new and useful Improvements in Cloth-Tentering Machines, of which the following is a specification.

My invention relates to machines or apparatus for tentering, stretching, and widening woven fabrics; and it consists in improved arrangements or mechanism for self-actingly moving the chain-pulleys over which the chains, with pins or clips for holding the fabric, pass at the front end, according to the variations in the width or the position of the selvages of the fabric, so that the pins or clips seize the fabric always at the same distance from the selvage, thus preventing damage to the fabric and saving the labor of watching and regulating the position of the chain-pulleys by hand.

In carrying my invention into effect I arrange below the chains, near to the front end of the machine, a cross-beam or bed, on which two carriages are mounted and slide on suitable guides. Each carriage has attached to it a fork or its equivalent, entering a circular groove in the boss of the respective chain-pulley, which slides on its shaft and is driven by a sliding key fitting a groove in the shaft, so that the chain-pulley follows the lateral movements of the carriage. This movement is produced automatically by the following arrangement: On a bracket fixed to the carriage I suspend a pendulous lever or finger in such a manner that the upper end of the same is held against the edge of the cloth in front of the chain-pulley by the weight of the lower end. The latter is bent at the bottom end and forms a catch for a plate formed with a number of steps or teeth overhanging one beyond the other, which plate is attached to a lever fixed on a horizontal shaft on the carriage and receiving at regular intervals an oscillating movement. When the stepped plate is lifted, the finger is free to move, and, according to the position in which it is held by the edge of the cloth, will catch one or the other of the teeth when the plate descends and holds it in the corresponding position till the next lift of the plate. The position of

the stepped plate controls mechanism for moving the carriage, arranged in such a manner that when the finger catches the middle step or tooth no movement of the carriage takes place; but when it catches one of the reeth below or above the middle one the carriage is moved to the same side the upper end of the finger has moved and for the same or nearly the same distance, so that the chain-pulley is likewise moved for this distance, and the teeth or clips on the chain always enter or seize upon the cloth at the same or nearly the same distance from its edge.

In order that my invention may be more clearly ascertained, I have hereunto appended a sheet of drawings, on which—

Figure 1 shows a side view of the carriage, and Fig. 2 a plan of the same with controlling-finger and mechanism; Fig. 3, a back view of the carriage; Fig. 4, a front view of the finger and catch-lever; Figs. 5 and 6, enlarged views of the reversing mechanism for shifting the carriage in either direction; Figs. 7 and 8, enlarged views of the catch-levers; Figs. 9 and 10, enlarged views of the finger.

Only one carriage on the right-hand side of the machine is shown on the drawings, that on the other side being arranged in the same way symmetrically to the former.

On the drawings, a is a shaft supported and rotated in bearings on the machine-frame sides, carrying on each side a chain-pulley a' , rotated with the shaft by means of a sliding key fixed to the pulley and sliding in a groove a^2 of the shaft. The chain-pulley is formed with teeth a^3 , entering slots in the link chain b , Figs. 1 and 2, in the usual manner. The links of the chain have lateral projections b' , Figs. 2, 3, and 4, with pins or their equivalent, which enter or seize upon the edge of the cloth c , and, carrying it forward, stretch or widen out the cloth in the ordinary manner. The cloth c is drawn off a roller and passes over a guide-rail c' , Fig. 1, to the chains. A bed or cross-rail d is fixed upon the frame sides of the machine and carries on each side a carriage d' , which can slide on it. Upon the carriage an angle-bracket d^2 is fixed, to which an arm d^3 is attached, which enters a circular groove in the boss a^4 of the chain-pulley a' and holds the latter in its position upon the shaft a or moves it to one or the

other side when the carriage d' shifts its position on the bed d . To the end of the arm d^3 a bracket e is fixed, with a forked bracket e' , on which a finger f can oscillate, Figs. 2 and 4. The finger f is bent, as shown by Figs. 1, 4, and 9, and fitted with an adjustable top part f' , which can be set to touch the edge of the cloth c and is held against it by the weight of the lower part of the finger f . The latter is T-shaped, or formed with lateral projections at the bottom end, so as to catch with one of these one of the steps or teeth of the stepped plate g , fixed to lever g' , when the latter is lifted and dropped in the manner hereinafter described. In order to insure the finger catching the teeth fairly on their horizontal surfaces, a second lever g^2 is mounted loosely upon the shaft h , on which lever g' is fixed and is lifted by a bracket g^3 , fixed to the lever g' . The lever g^2 is formed with a series of triangular notches corresponding in width with the steps of the plate g , and the projection on the end of the finger f is made V-shaped at the part extending under the lever g^2 , so as to fit into the notches. The bracket g^3 is so adjusted that when the lever g' drops it allows the lever g^2 to fall upon the end of the finger f and fix it by one of its notches before the plate g touches it, so as to bring the finger fairly under one of the steps of plate g . When the edge of the cloth c pushes the finger $f f'$ to the right, so that the plate g is caught on the fourth step, as shown by Fig. 4, the lever g' , and shaft h are thereby held in the position shown. The shaft h controls mechanism for moving the carriage d' , arranged in such a manner that when the plate g is caught on step 4 the carriage is shifted to the right, so that the chain-pulley a and chain b and its pins or their equivalents are moved in the same way and seize the cloth at the same distance from its edge as before. The fulcrum e is shifted thereby to the right along with the carriage, so that if the edge of the cloth remains in the same place on rail c' as before the lever f moves to the left at the top and to the right at the bottom during the next lift of the lever g' and catches the plate g on the third step, when no movement of the carriage takes place and the chain-pulley remains in its place till the edge of cloth c shifts again its position on rail c' . When the finger $f f'$ is shifted to such an extent that the plate g is caught on the fifth step, the carriage is shifted for double the distance to the right, while when it catches on steps 2 and 1 it is shifted for one or two spaces to the left. The chain-pulley in this way follows the variations in the position of the edge of the cloth as it passes over rail c' , and the pins or clips on the chain always enter into or seize upon the cloth at the same distance from its edge.

The mechanism for shifting the carriage controlled by the stepped plate-lever g' may be variously arranged, that shown on the drawings and hereinafter described being

only one way in which this can be done conveniently and simply. It is arranged as follows: The shaft h is carried in bearings $h' h^2$, Fig. 2, fixed upon the carriage d' , and has a lever h^3 , with bowl h^4 fixed on it, which is lifted by a cam i once during each revolution of the shaft i' . The latter revolves in bearings $i^2 i^3$, fixed on the carriage d' , and is rotated through spur-wheels $k k'$ by a band-pulley k^2 , running on a stud fixed in bracket k^3 on the carriage d' . The band-pulley is rotated by an endless rope or band from any convenient revolving shaft of the machine. Upon the shaft i' two bevel-wheels $l l'$, with clutch-teeth on their backs, are loosely mounted, as well as two separate clutch-boxes $m m'$, which may slide on a key fixed to shaft i' , and thus be rotated with the same, or they may be fixed on the shaft and the latter arranged so that it can slide endwise. The clutch-boxes are held out of gear with the bevel-wheels by springs $m^2 m^3$ and can be put into gear independently of each other in the manner hereinafter described. The bevel-wheels $l l'$ both gear with another bevel-wheel n , fixed upon the screw-spindle n' , which can turn in the bearings n^2 , fixed upon the carriage, and is held endwise in the same by the bevel-wheel n and a collar or hoop n^3 . The spindle is threaded through a nut o , fixed in a bracket o' , which is bolted to the bed d . As one or the other bevel-wheel l or l' is connected to its clutch-box and rotated with the shaft i' the bevel-wheel n and spindle n' will be rotated in one or the other direction and the carriage d' drawn to the left or to the right.

The clutch-boxes m and m' , Figs. 5 and 6, are engaged with the clutches on the bevel-wheels l and l' by means of levers p and p' , fixed upon the shaft h , and of cams fixed upon the clutch-box bosses. Upon each of the latter a double cam $r r'$ is fixed, consisting of a lower longer part r and an upper shorter one r' of about half the length of the former, formed with an inclined or rounded portion at the leading end. The levers $p p'$, fitted with steel ends bent toward the shaft, are so set that the distance of their points $p^2 p^3$ slightly exceeds the diameter of the outer cams and so that when the catch-plate g is caught by the finger f on the middle step and the shaft h in its middle position both levers are clear of the cams. When the plate g is caught on the fourth step, the end p^2 of lever p is lifted into the pathway of the cam r' on clutch-box m , and by means of the incline on the cam pushes the clutch-box into gear with the wheel l , so that the wheel n and spindle n' are turned for a short time till the lever end p^2 slips off the cam r' , when the spring m^2 disengages the clutch. The carriage is thereby moved to the right of the cloth in the manner hereinbefore described. When the plate g is caught on step 5, the lever p is held up higher and its end comes into contact with the lower cam r and pushes the clutch m into gear with wheel l and holds it for a longer

time, so that the spindle n' is rotated longer and the carriage d' moved to the right for a greater distance. When the plate is caught on steps 2 and 1, the lever p is brought to act on the cams r' and r on clutch-box m' , pushing it into and holding it in gear with the wheel l' , whereby the spindle n' is rotated for a shorter or longer interval, respectively, in the opposite direction and the carriage correspondingly shifted to the left. The carriage d in this way follows the movement of the upper end of finger f and is shifted according to the varying position of the edge of the cloth c on the rail c' , so that the pins or clips on the chain seize the cloth at the same distance from the edge, the speed of the shaft i' on the carriage being determined so that the mechanisms hereinbefore described act and shift the carriage while a point on the edge of the cloth passes from the finger f to the chain b .

The way in which the wheels l and l' are connected to the shaft i' for a shorter or longer period, according to the catch-plate g being caught by the finger f on the steps below or above the central step, may be modified. The plate g may be made with more or less steps than five.

The apparatus for moving the chain-wheels automatically for a distance corresponding to the movement of the edge of the cloth at the point where the finger $f f'$ touches the same is applicable to all kinds of machines for tentering, stretching, or widening fabrics of any kind where chains with pins or clips for seizing the edges are employed.

I claim—

1. The combination, with a machine for tentering, stretching, and widening fabrics by means of diverging chains, to which the fabrics are attached, of an oscillating finger $f f'$, resting against the edge of the fabric, and an intermittently-lifted lever g' , with a stepped plate g , caught in different positions by said finger, front chain-pulleys, and mechanism for moving said pulleys in the same way as the part of the finger resting against the fabric is moved, said mechanism lying in the path of said finger, and means for lifting the lever g' .

2. The combination, with a machine for tentering, stretching, and widening fabrics by means of diverging chains, to which the fabrics are attached, of a chain-pulley a' , a shaft a therefor, a lever g' , a stepped plate g , a finger $f f'$, a cross-bed d , with a sliding carriage d' at each side of the machine, provided with an arm $d^2 d^3$ for holding and moving the chain-pulley a' laterally on its shaft a , mechanism for traversing said carriage d' inward and outward on said bed d , controlled by the position of the intermittently-lifted lever g' , with the stepped plate g , caught by the finger $f f'$,

resting against the edge of the fabric in various positions in such a manner that the chain-pulley a' follows the movement of the end of said finger $f f'$, resting against the edge of the fabric.

3. The combination, with a machine for tentering, stretching, and widening fabrics by means of diverging chains, to which the fabrics are attached, of a chain-pulley a' , a shaft a therefor, a lever g' , a mechanism controlled thereby, a stepped plate g , mechanism for shifting the carriage d' , a cross-bed d , a sliding carriage d' at each side of the end of the machine, an arm $d^2 d^3$, attached to said carriage d' and holding and moving the chain-pulley a' on the shaft a , a rotary cross-shaft i' , with two wheels loosely mounted thereon and connected to and disconnected from the shaft for varying periods by mechanism controlled by the position of the intermittently-lifted lever g' , with stepped plate g , and a finger $f f'$, resting against the edge of the fabric and catching said lever, said wheels actuating the mechanism for shifting the carriage d' inward when one of said wheels is connected to the cross-shaft i' and outward when the other wheel is so connected.

4. The combination, with a machine for tentering, stretching, and widening fabrics by means of diverging chains, to which the fabric is attached, of a chain-pulley a' , a shaft a therefor, a cam i , a cross-shaft i' , a stepped plate g , cams $r r'$, clutch-boxes $m m'$, a screw-spindle n' , a cross-bed d , with a carriage d' sliding thereon at each side of the machine, an arm $d^2 d^3$, attached to said carriage and holding and moving the chain-pulley a' on the shaft a , a finger $f f'$, carried by said arm, a shaft h , supported in bearings on the carriage and intermittently rocked by the cam i on the rotating cross-shaft i' , mounted on the carriage d' , a lever h^3 , fixed on said shaft h , a lever g' , with stepped plate g , and levers p and p' , fixed upon shaft h and acting according to the position said shaft is held in in consequence of said finger $f f'$ catching various steps of the stepped plate g upon cams r or r' on clutch-boxes m or m' on said cross-shaft i' , bevel-wheels l and l' , driven by said clutch-boxes when engaged with them, a bevel-wheel n , gearing with said wheels $l l'$ and fixed upon the screw-spindle n' , a bearing n for said spindle fixed to carriage d' , and a nut o , fixed to the cross-bed d , substantially as hereinbefore described, and for the purposes set forth.

In testimony whereof I have hereunto set my hand in presence of two witnesses.

ALFRED BRADBURY.

Witnesses:

F. O. BENTLEY,
CARL BOLLÉ.