

(No Model.)

2 Sheets—Sheet 1.

G. E. BEAUMONT & J. P. FAULDS.  
LOOM.

No. 561,933.

Patented June 9, 1896.

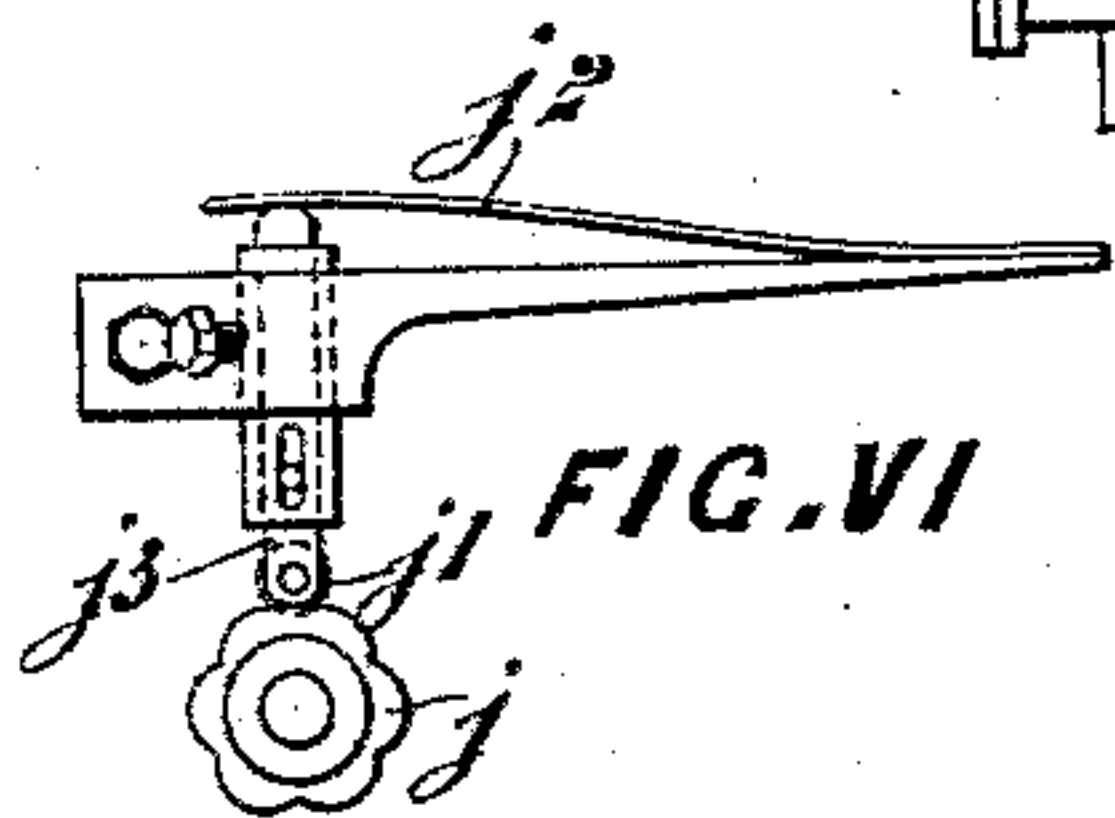
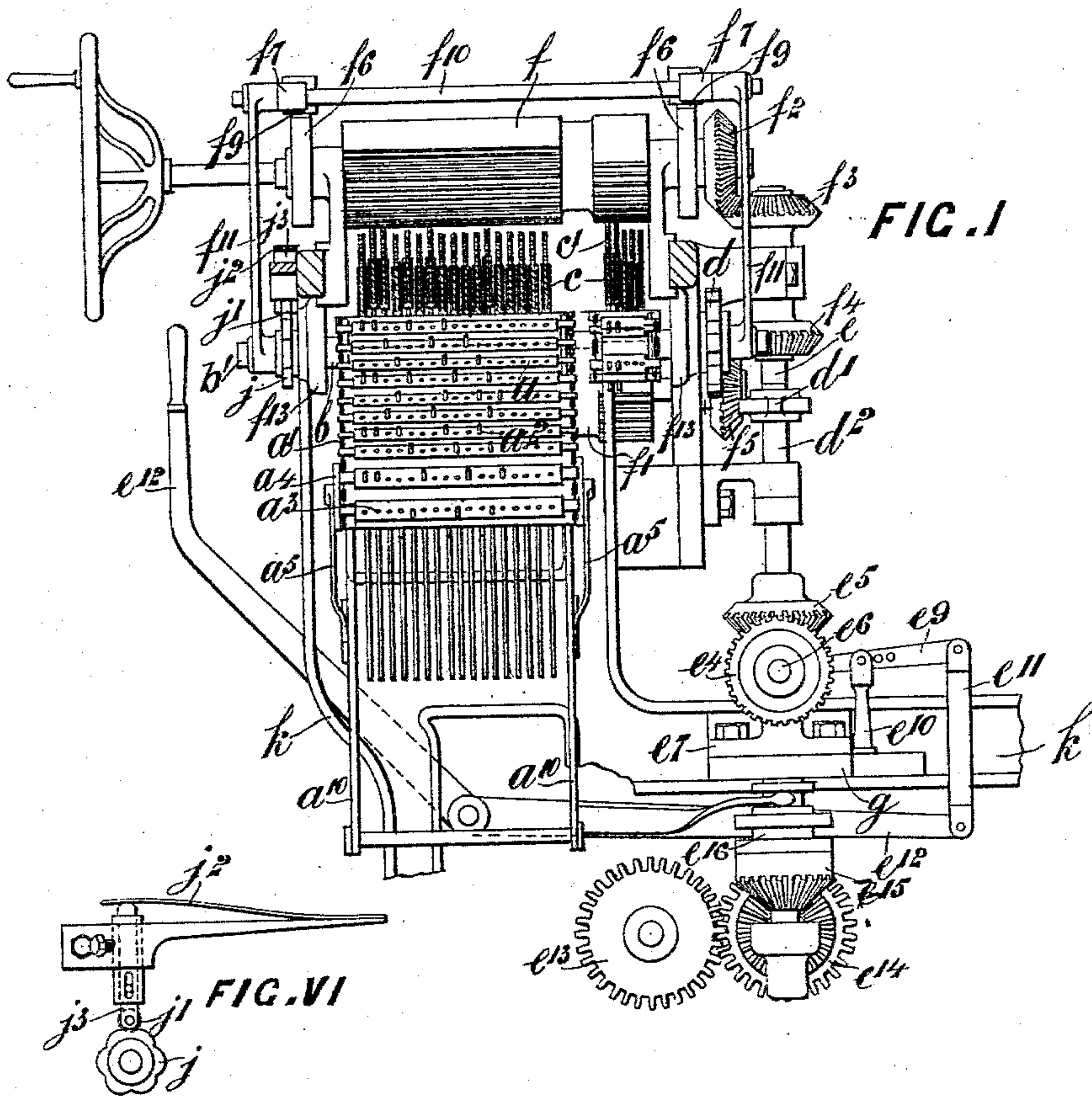
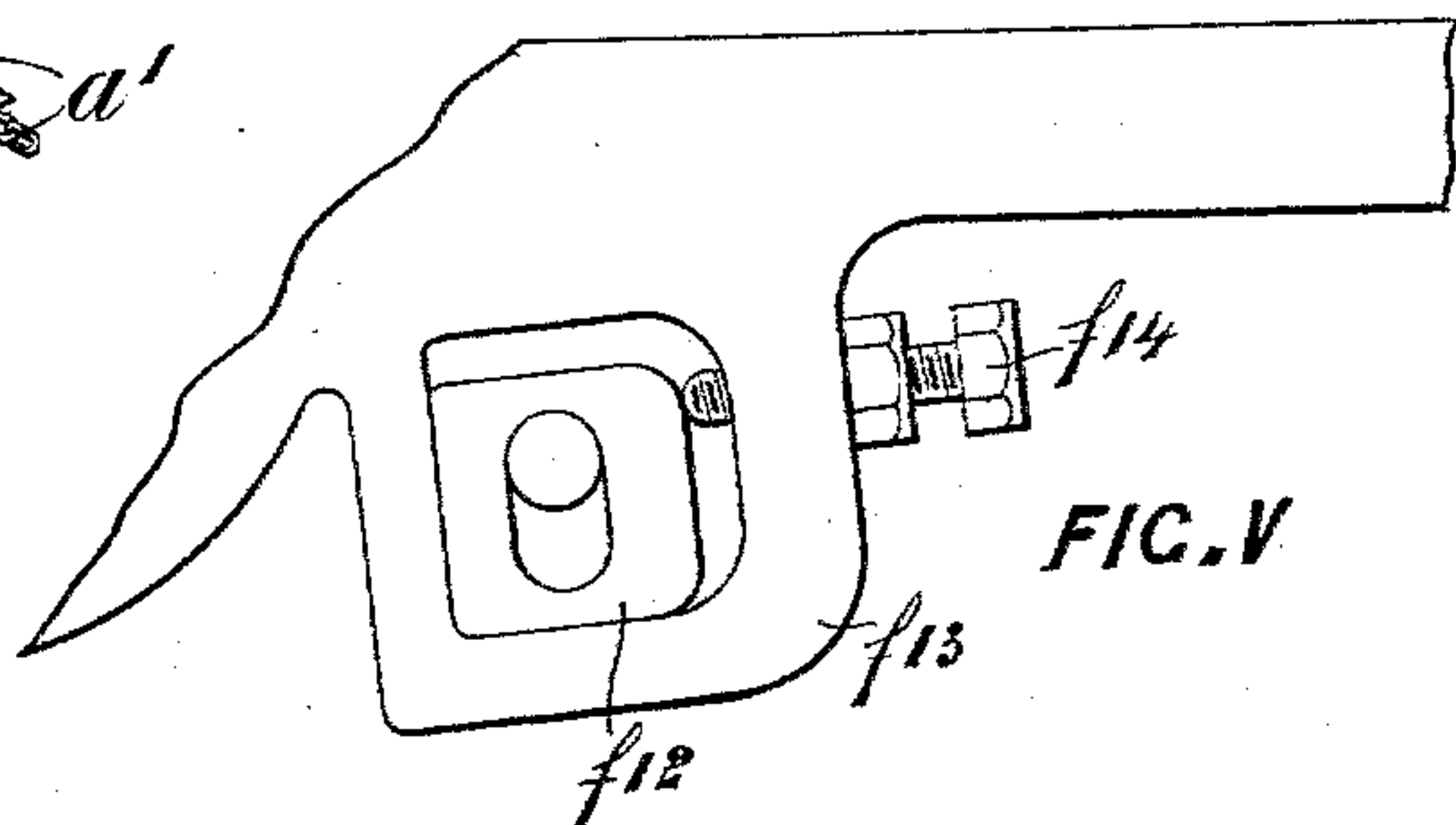
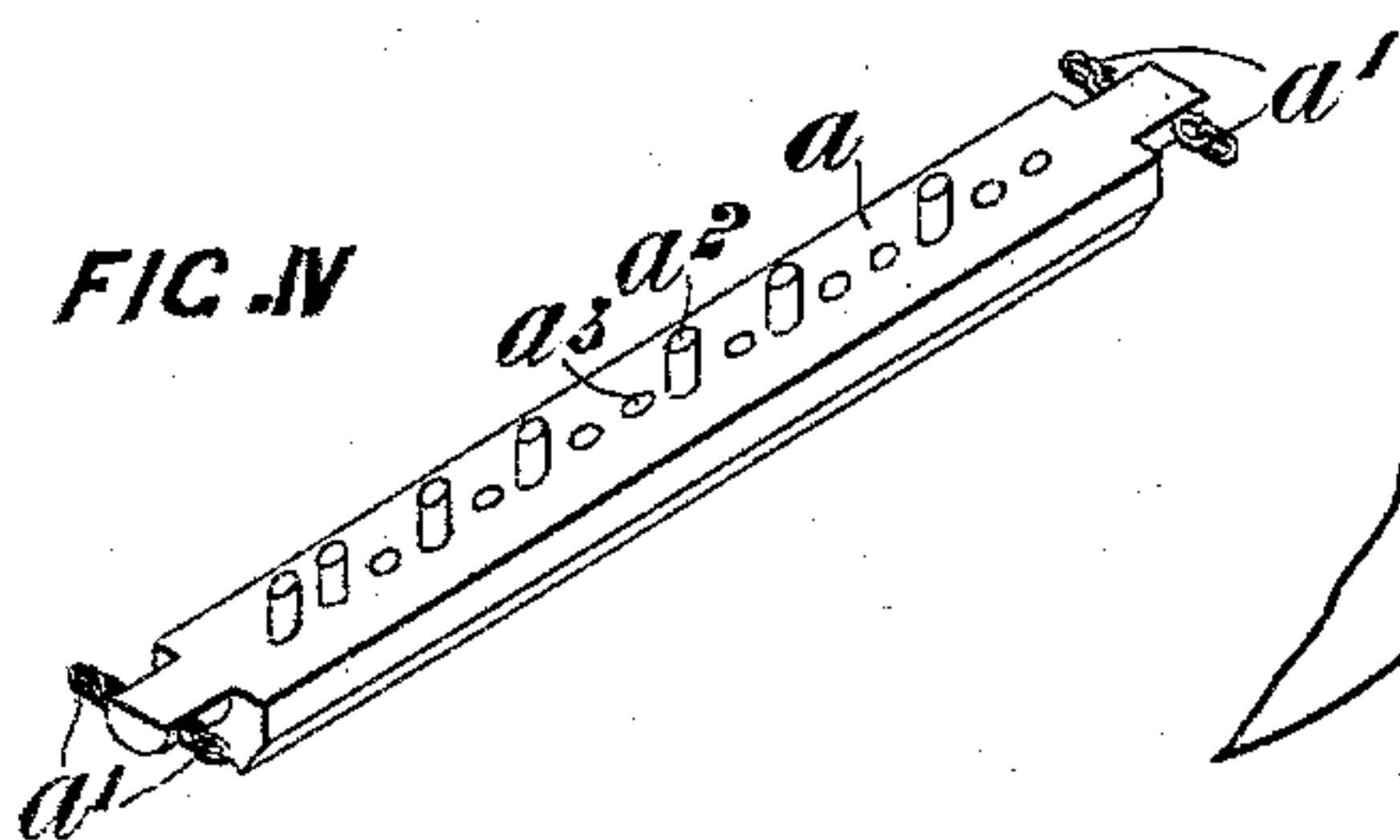


FIG. IV



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(No Model.)

2 Sheets—Sheet 2.

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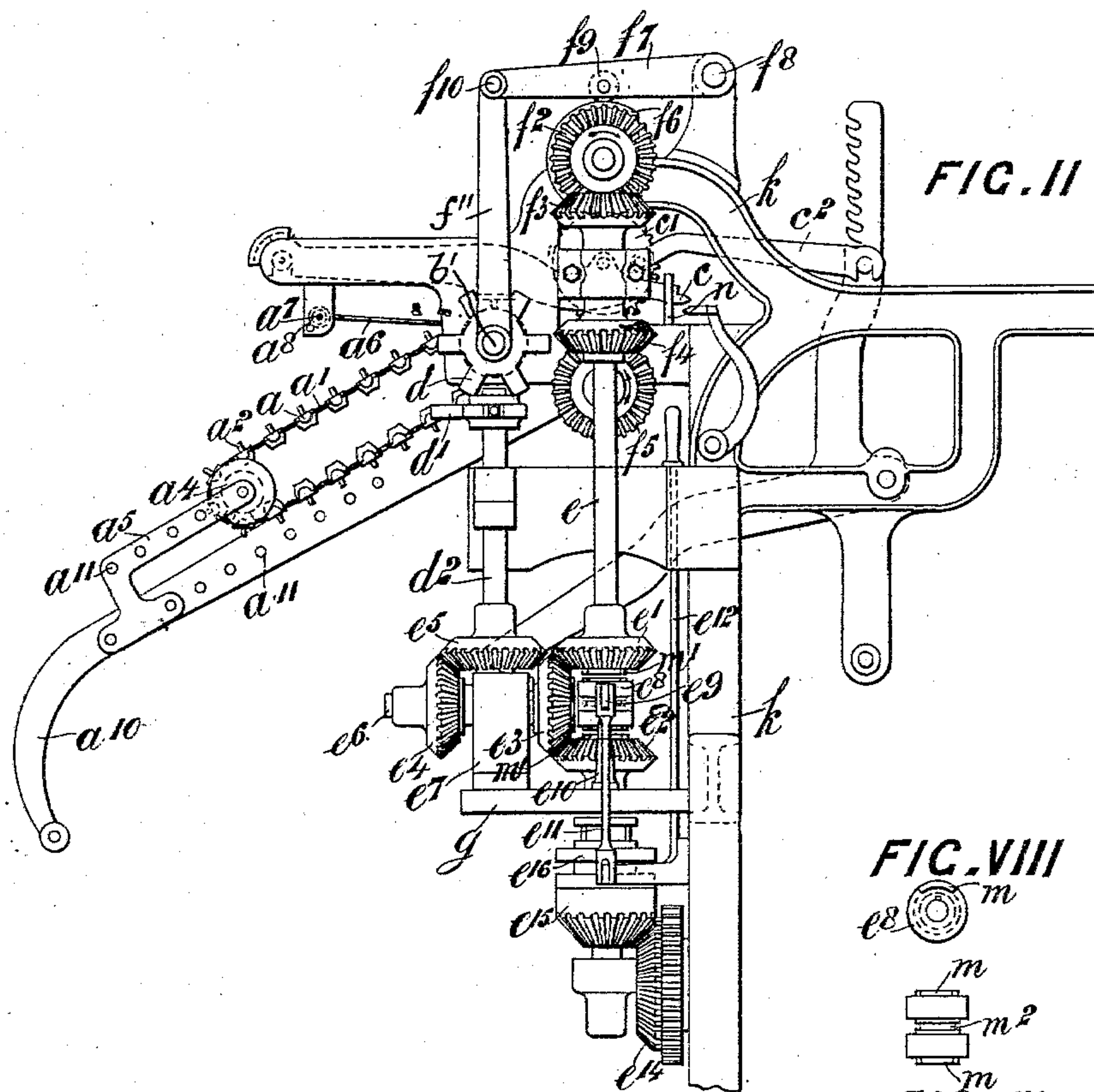


FIG. II

FIG. VIII

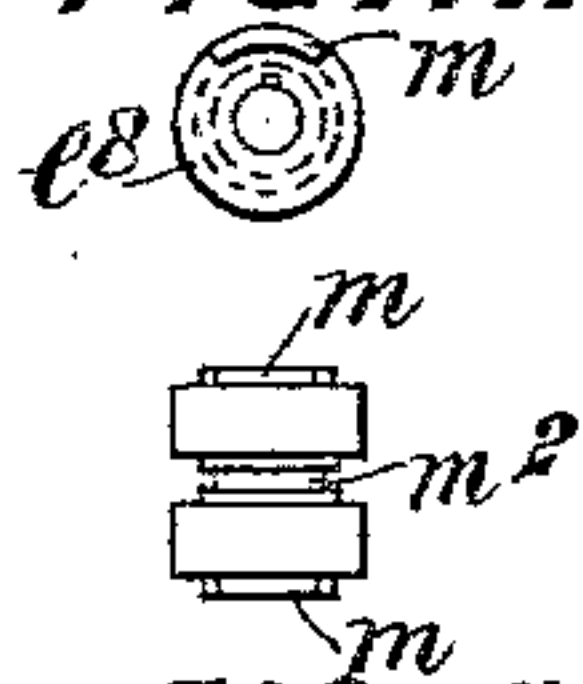


FIG. IX

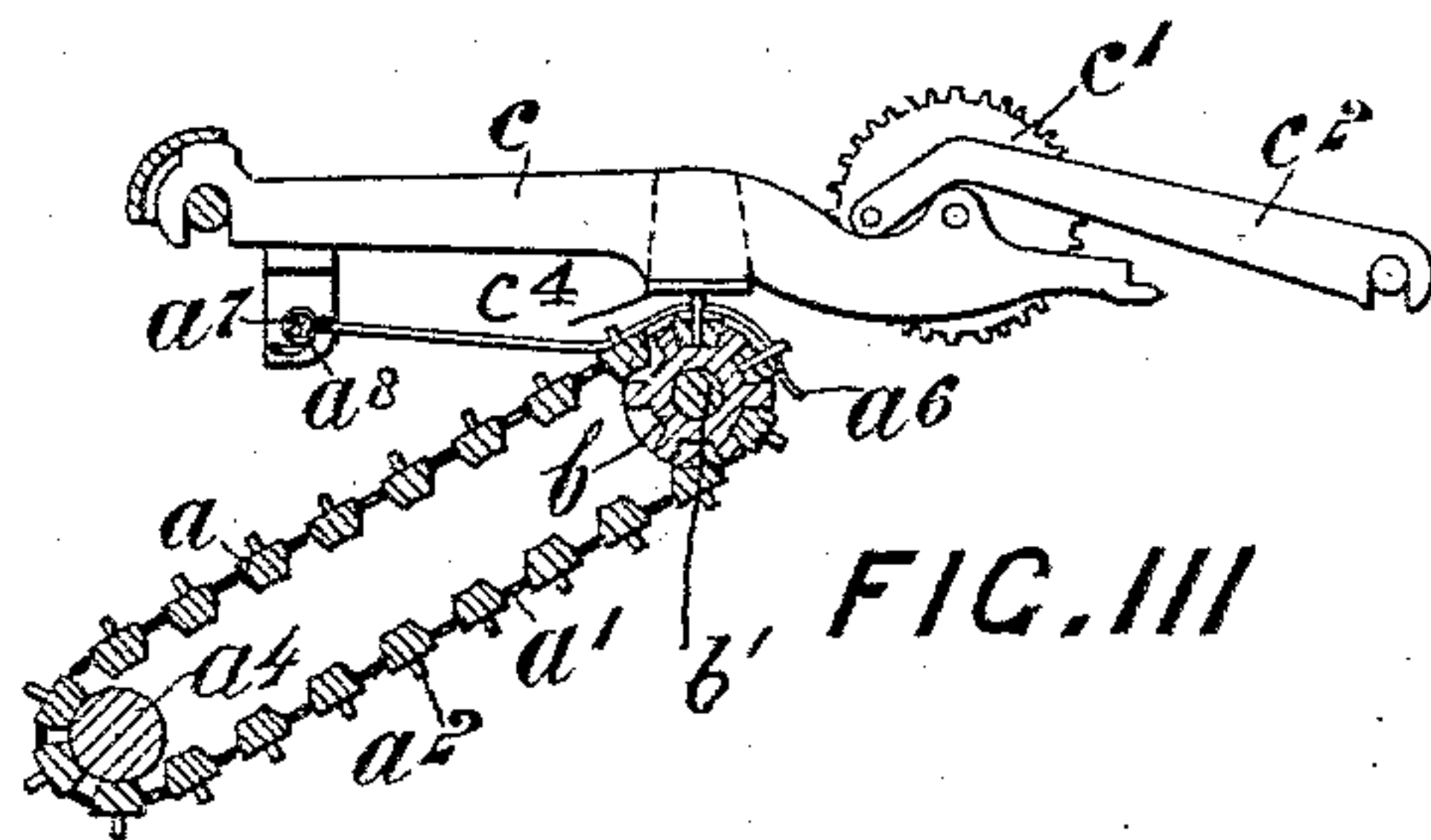


FIG. III

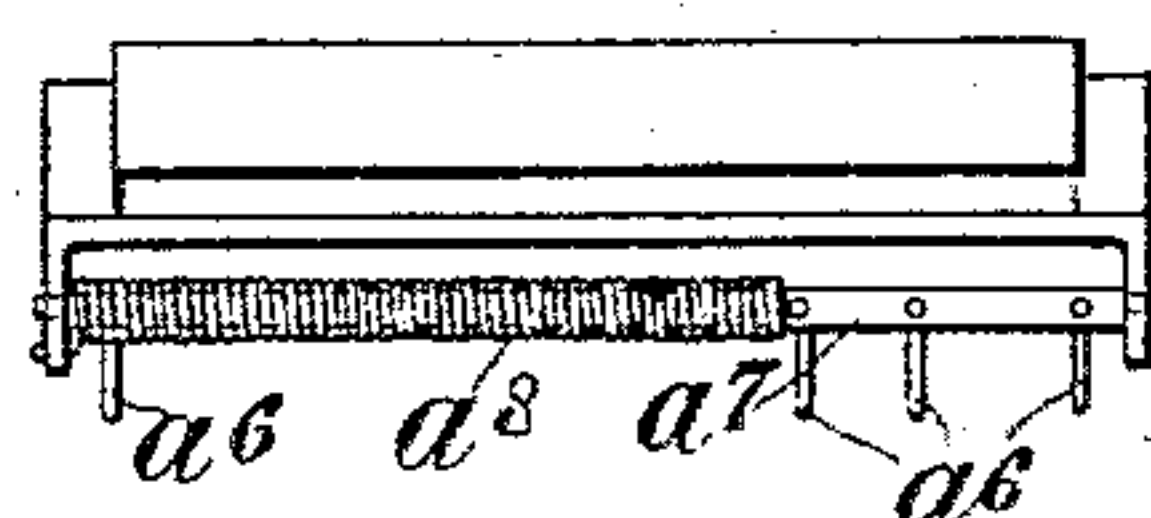


FIG. VII

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# UNITED STATES PATENT OFFICE.

GEORGE EDWARD BEAUMONT AND JOHN POLLOCK FAULDS, OF DUNEDIN,  
NEW ZEALAND, ASSIGNORS OF ONE-THIRD TO ROBERT GLENDINING, OF  
SAME PLACE.

## LOOM.

SPECIFICATION forming part of Letters Patent No. 561,933, dated June 9, 1896.

Application filed November 4, 1895. Serial No. 567,902. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE EDWARD BEAUMONT, power-loom tuner, and JOHN POLLOCK FAULDS, engineer, British subjects, and residents of Dunedin, in the Colony of New Zealand, have invented certain new and useful Improvements in Looms, of which the following is a specification.

Our invention includes the special features of construction and arrangement of parts hereinafter particularly described, and pointed out in the claims.

In order that our invention may be most easily understood by one skilled in the art to which it appertains, we have illustrated the same upon the accompanying drawings, to which we shall refer while giving a detailed description.

Similar letters of reference indicate similar parts throughout the views.

Figure 1 is a front view of our apparatus and showing such parts of a loom as are necessary for purposes of description. Fig. 2 is a side view of the same. Fig. 3 is a side section of the harness and showing one of the vibrators raised by one of the pegs. Fig. 4 is a perspective view of one of the lags with its pegs on a larger scale. Fig. 5 is a view of the slotted bearing of the cylinder on a larger scale. Fig. 6 is a side view of apparatus for steadying the cylinder. Fig. 7 is a side view of part of Fig. 3. Fig. 8 is a plan of the clutch. Fig. 9 is an elevation of the same.

The lags *a* are shaped, as shown in Fig. 4, to fit the ordinary cylinder *b*, as shown in Fig. 3, and are made of hard wood by preference. These lags are joined together by links *a'*, which are readily opened and taken apart when more or less lags are required, and are provided with holes *a<sup>3</sup>*, which are spaced apart to correspond with the position of the vibrators *c*. Hard-wood pegs *a<sup>2</sup>* fit tightly into these holes *a<sup>3</sup>*, and, passing through the lags, rest upon the body of cylinder *b*. In place of the usual metal friction-block upon vibrators *c* we use a block made of hard wood *c<sup>4</sup>* for receiving the thrust of pegs *a<sup>2</sup>*. Said pegs *a<sup>2</sup>* may be readily removed by means of a pair of pliers from one hole to another, and, if desired, without taking the lags off the machine. When joined together, these lags constitute

a pattern or box-pattern chain and replace the present expensive, heavy, and intricate pattern-chain. A roller *a<sup>4</sup>*, of wood by preference, is passed through the lower end of the pattern-chain and is carried upon suitable brackets *a<sup>5</sup>* for guiding the lags toward the cylinder *b*. Brackets *a<sup>5</sup>* are fixed to the usual supports *a<sup>10</sup>* and may be adjusted by means of holes *a<sup>11</sup>* to suit varying lengths of harness. Light rods *a<sup>6</sup>*, fixed into bar *a<sup>7</sup>* and actuated by spiral spring *a<sup>8</sup>*, press upon the lags as they pass over the cylinder and retain the same in position.

Cylinder *b* is revolved by star-pointer *d*, which is keyed upon the extension of the journal of said cylinder, and by kicker *d'*, which is keyed to shaft *d<sup>2</sup>*. Motion is imparted to shaft *d<sup>2</sup>* from shaft *e* through bevel-wheels *e'* or *e<sup>2</sup>*, intermediate bevel-wheel *e<sup>3</sup>*, and bevel-wheels *e<sup>4</sup>* and *e<sup>5</sup>*. Wheels *e<sup>3</sup>* and *e<sup>4</sup>* are keyed to shaft *e<sup>6</sup>*, which revolves in its bracket *e<sup>7</sup>*, and wheel *e<sup>5</sup>* is keyed to shaft *d<sup>2</sup>* and has a step-bearing in bracket *e<sup>7</sup>*. Bevel-wheels *e'* and *e<sup>2</sup>* run loosely upon shaft *e*, and either may be brought into operation by means of clutch *e<sup>8</sup>*, which is connected to shaft *e* by a feather, but is free to be raised or lowered by lever *e<sup>9</sup>*, working on pillar *e<sup>10</sup>*, link *e<sup>11</sup>*, and hand-lever *e<sup>12</sup>*. Clutch *e<sup>8</sup>* is shown separately in Fig. 8, where *m* are lugs which engage with similar lugs *m'* on bevel-wheels *e'* and *e<sup>2</sup>*. The fork of lever *e<sup>9</sup>* works within groove *m<sup>2</sup>*. Shaft *e* is revolved in the usual manner by wheels *e<sup>13</sup>*, *e<sup>14</sup>*, and *e<sup>15</sup>* and clutch *e<sup>16</sup>*. According as clutch *e<sup>8</sup>* is operated to engage with wheel *e'* or *e<sup>2</sup>*, so wheel *e<sup>3</sup>* will revolve one way or the other and with it shaft *d<sup>2</sup>*. In this manner the pattern-chain is made to reverse at will.

Cylinders *f* and *f'* are revolved by bevel-wheels *f<sup>2</sup>* and *f<sup>3</sup>* and *f<sup>4</sup>* and *f<sup>5</sup>*, respectively, in the usual manner, and upon the extensions of axle *f<sup>10</sup>* of cylinder *f* are keyed cams *f<sup>6</sup>*, having a flat side, as shown by dotted line in Fig. 2. Above these cams are provided levers *f<sup>7</sup>*, which revolve around their fulcrums *f<sup>8</sup>* and have near their central part friction-rollers *f<sup>9</sup>*. Upon their outer ends these levers *f<sup>7</sup>* receive a shaft *f<sup>10</sup>*, and to this said shaft are suspended links *f<sup>11</sup>*. The axle *b'* of cylinder *b* passes through and revolves within the



lower ends of said links  $f^{11}$  and also passes through its slotted bearing  $f^{12}$ . (Shown on large scale in Fig. 5.) Bearing  $f^{12}$  is carried within the main frame  $f^{13}$  of the machine and held by set-screw  $f^{14}$  in the usual manner.

The manner in which our apparatus operates is as follows: Shaft  $e$ , supported on its bracket  $g$ , which is attached to main framing  $k$ , runs continuously in one direction, carrying with it clutch  $e^8$ . By operating lever  $e^{12}$  said clutch may be made to engage with bevel-wheel  $e'$  or  $e^2$  to revolve shaft  $d^2$  in either direction. Bevel-wheels  $e'$ ,  $e^2$ ,  $e^3$ ,  $e^4$ ,  $e^5$ ,  $f^2$ ,  $f^3$ ,  $f^4$ , and  $f^5$  have all the same number of teeth, so that shafts  $e$  and  $d^2$  and cylinders  $f$  and  $f'$  make the same number of revolutions in any given time and simultaneously. It therefore will be seen that cam  $f^6$  and kicker  $d'$  make their revolutions simultaneously, and they are so placed relatively to each other that cam  $f^6$  permits lever  $f^7$  to fall while kicker  $d'$  revolves star-pointer  $d$  the distance of one tooth. By the fall of said lever  $f^7$  the cylinder  $b$  and vibrator  $c$  also fall; but the vibrator is retained in the usual manner upon its leveling-bar  $n$ , Fig. 2, and cylinder  $b$  continues to fall until peg  $a^2$  is clear of its vibrator. Kicker  $d'$  then advances cylinder  $b$  the distance of one tooth of star-pointer  $d$  and brings the next lag, with its pegs, into position. Here the said cylinder  $b$  is held steady by its indented roller  $j$ , friction-wheel  $j'$ , and spring  $j^2$ . The action of this indented roller will be obvious from Fig. 6, where carrier  $j^3$  and its friction-wheel  $j'$  are forced against roller  $j$  by spring  $j^2$ . While in this lower position wheel  $c'$  will have engaged with lower cylinder  $f'$  and brought connector  $c^2$  back into its first position. A fresh lag being now in position and cam  $f^6$  continuing to revolve, lever  $f^7$  will be raised, and with it cylinder  $b$  and such vibrators as are found above the pegs, until wheels  $c'$  engage with upper cylinder  $f$  to operate connectors  $c^2$ . In this manner the operations are repeated and continued and the heddles of the loom operated as required to work the pattern in hand.

We wish it to be understood that we do not

confine ourselves to the exact details hereinbefore described, as these may be varied in several ways without departing from the principle of our invention.

We are aware that lags and pegs have been used upon other machinery, and we do not claim the use of these, broadly; but,

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In combination in a loom, the upper and lower cylinders  $f$ ,  $f'$ , the vibrator having the crank-gears with connectors for operating the shed-forming mechanism, the pattern-cylinder with its chain, the cams  $f^6$  on the shaft of one of the cylinders, the levers  $f^7$  and depending links  $f^{11}$  operated thereby, said links having the pattern-cylinder at their lower ends, the star-wheel on the pattern-cylinder shaft, the upright shaft  $d^2$ , the kicker  $d'$  thereon for operating the star-wheel of the pattern-cylinder when the same is lowered and means for driving the upright shaft, substantially as described.

2. In combination the cylinders  $f$ ,  $f'$ , the vibrators with their crank-gears and connectors for operating the shed-forming mechanism, the pattern-cylinder with its chain for operating the vibrators, means for raising and lowering the pattern-cylinder comprising the cams  $f^6$  on the shaft of the upper cylinder, the horizontal levers  $f^7$ , the links  $f^{11}$  depending from the free ends thereof and carrying the said pattern-cylinder at their lower ends, the star-wheel on the pattern-cylinder, the kicker for operating the same, the upright shaft  $d^2$  carrying the kicker, the upright shaft  $e$ , the gearing between the same and the cylinder-shafts, and means for operating the said shafts, substantially as described.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

GEORGE EDWARD BEAUMONT.

JOHN POLLOCK FAULDS.

Witnesses:

ERNEST SMITH BALDWIN,

JOHN IMRIE.