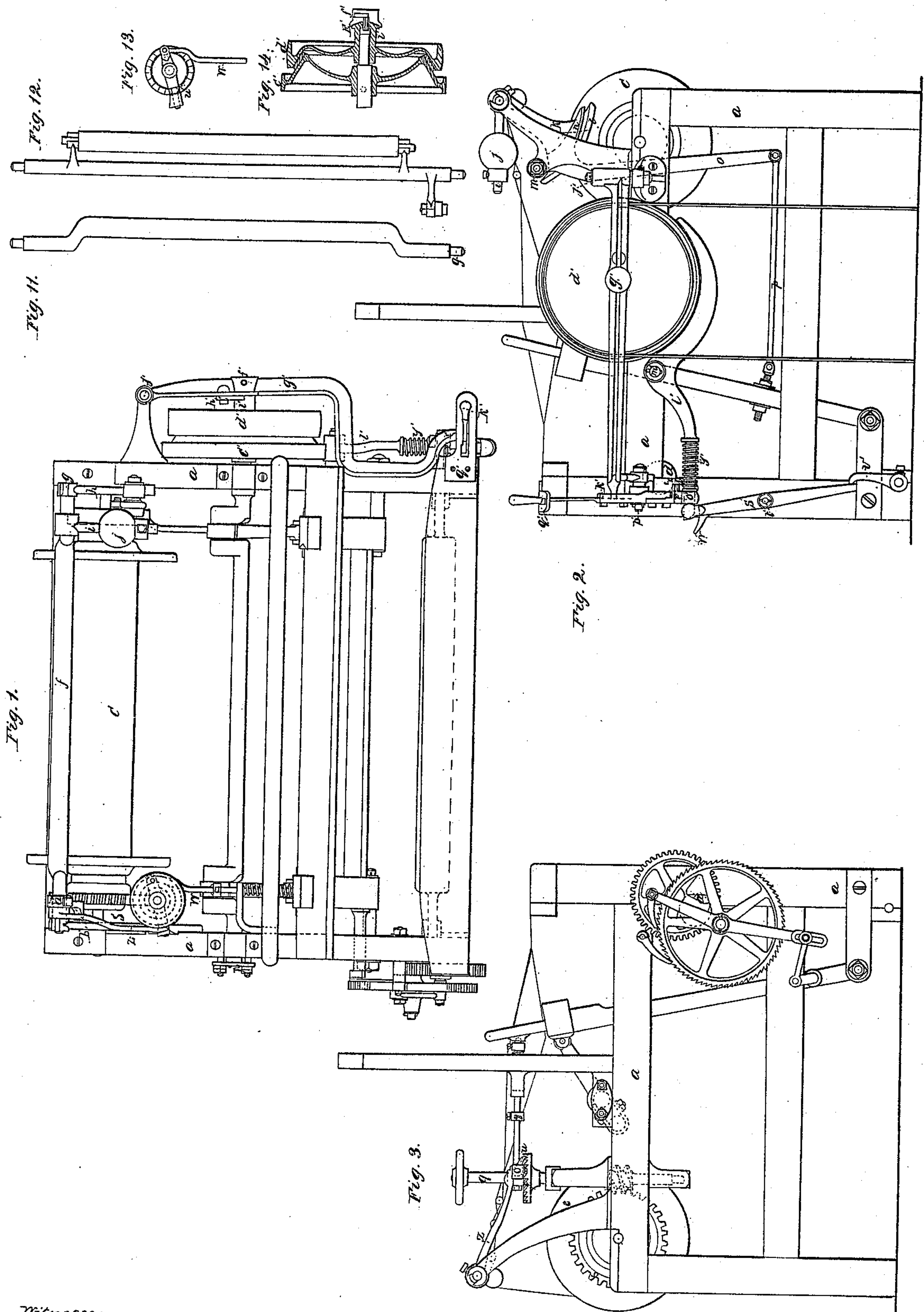


E. B. Bigelow.
Take-Up Motion.

Sheet 1-2 Sheets.

N^o 14,590.

Patented Apr. 8, 1856.



Witnesses
Chas. Hastings
Frank C. Hastings

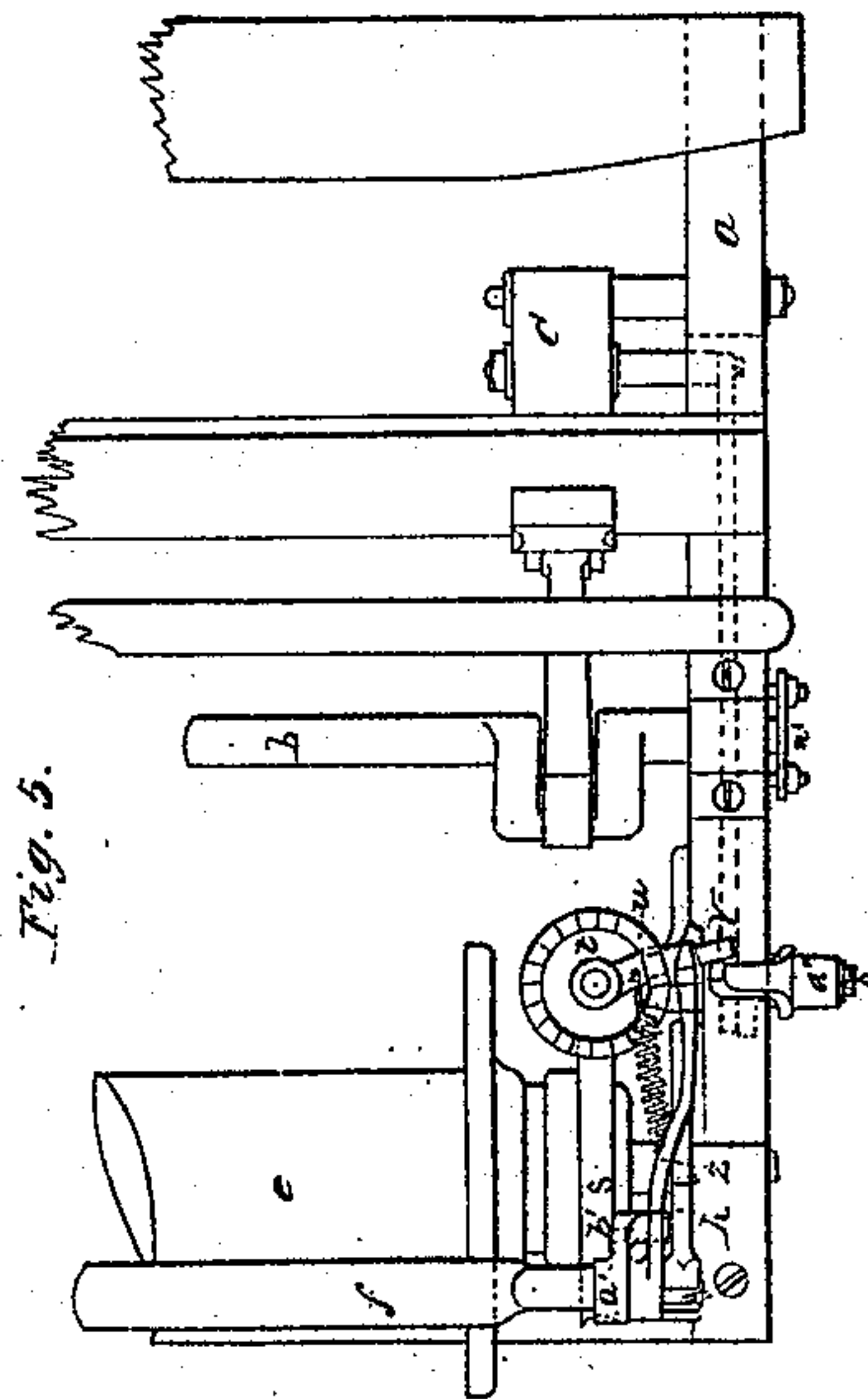
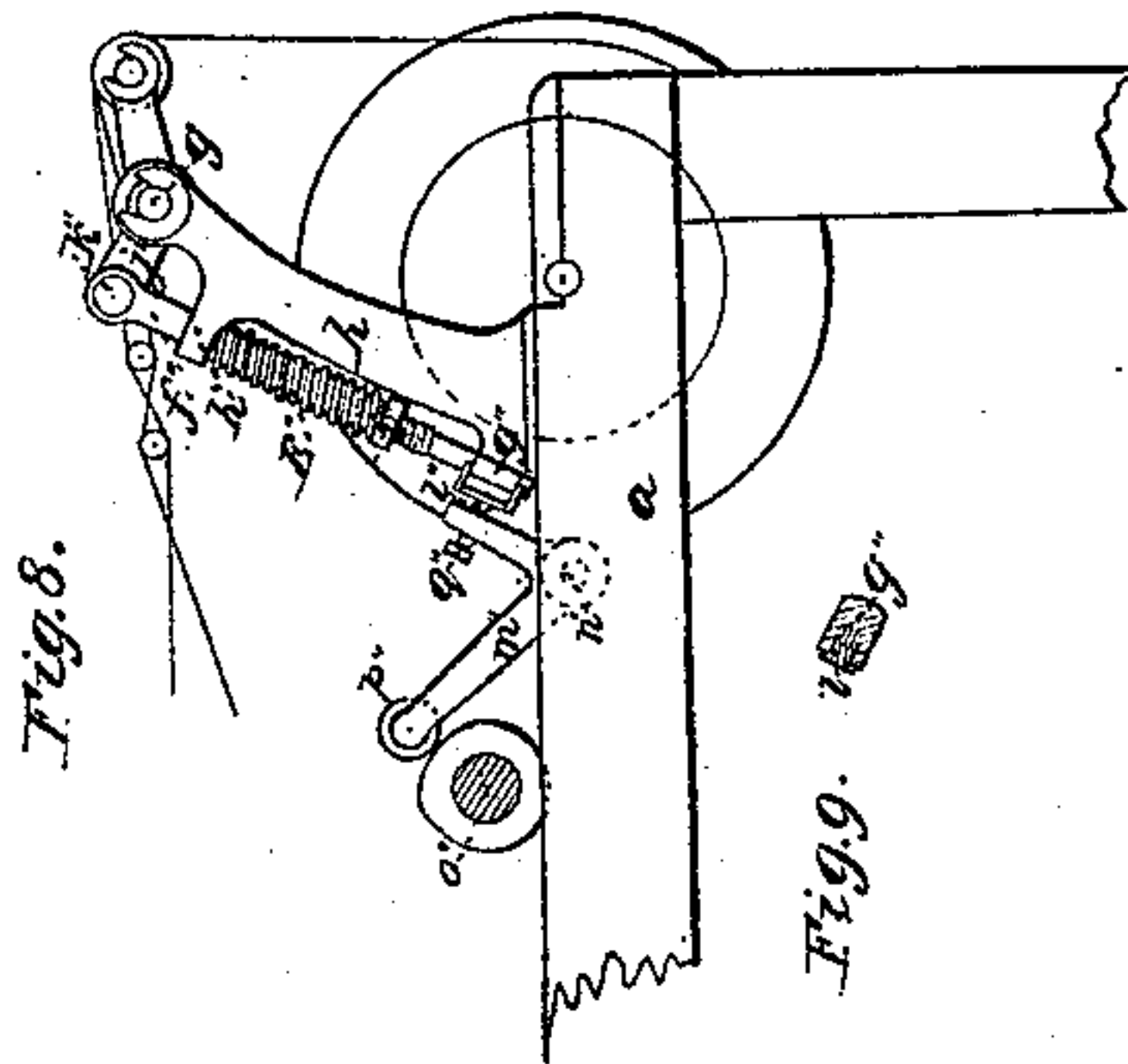
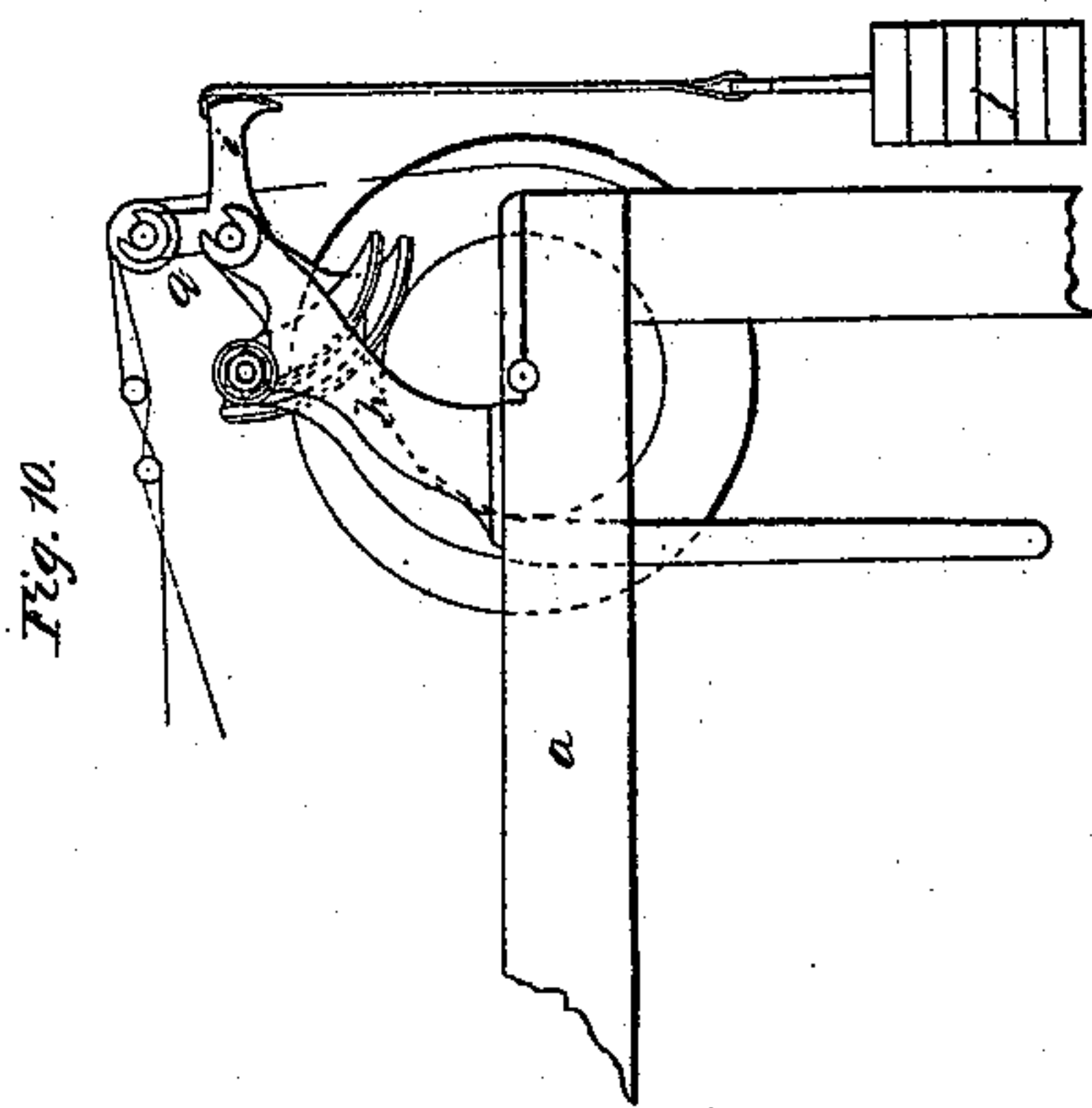
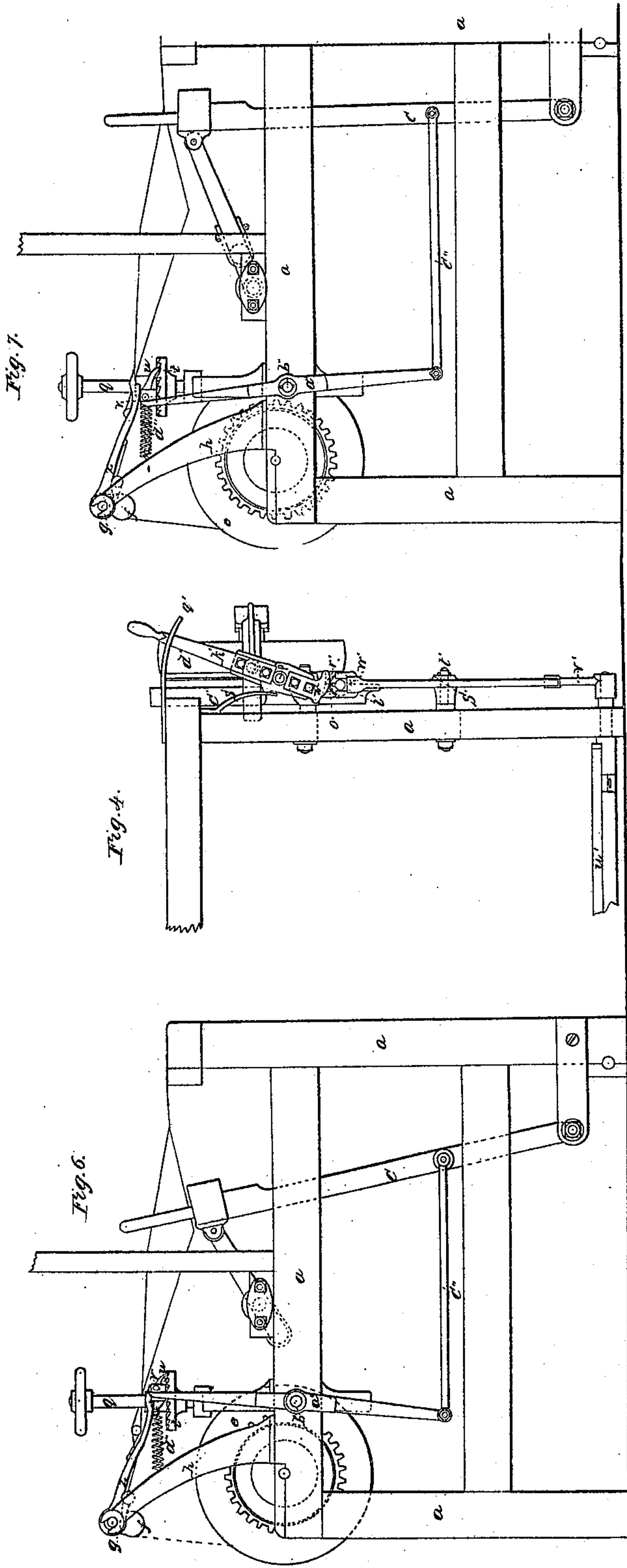
Inventor
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UNITED STATES PATENT OFFICE.

E. B. BIGELOW, OF BOSTON, MASSACHUSETTS.

LOOM.

Specification of Letters Patent No. 14,590, dated April 8, 1856.

To all whom it may concern:

Be it known that I, ERASTUS B. BIGELOW, of Boston, in the county of Suffolk and State of Massachusetts, have made certain
5 Improvements in Looms for Weaving Textile Fabrics, and that the following is a full, clear, and exact description of the principle or mode of operation which distinguishes them from all other things known, reference
10 being had to the accompanying drawings, in which—

Figure 1 is a plan of the loom. Fig. 2 is a right hand end elevation. Fig. 3 a left hand end elevation; Fig. 4 is a front view
15 of the driving cones and shipper; and Figs. 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14, are details and modifications.

The same letters indicate like parts in all the figures.

20 A part of my improvements relate to the delivery, or giving out of the warps, and consists in the mode of applying the brake or holder to the tension roller, or its equivalent, to hold the warps firmly when the
25 lathe beats up; and also in the mode of connecting the tension roller, or its equivalent, with the let off motion shaft, whereby the delivery of the warps is regulated.

Another part of my improvement relates
30 to driving, starting, and stopping the loom, and arresting its momentum when thrown out of gear, and consists in the mode of constructing the belt cone and combining it with the shipping lever whereby the said
35 belt cone may be conveniently oiled when the belt is in motion, and undue wear and tear of the hub of said belt cone and the shipping lever prevented. This part of my invention also consists in the mode of con-
40 necting the friction brake with the belt or cone shipper, and stop motions of the loom, whereby said brake is brought into action not only by the shuttle protector as heretofore done, but also by the weft stop motion,
45 the object being, when thrown out of gear by the weft stop motion, to arrest the loom at the stage of its operation most convenient for the weaver to change the shuttle, and also to hold the loom in position so as to
50 prevent its momentum or recoil from throwing the shuttle into the shed of the warps. When said shipper, which brings said friction brake into action as aforesaid is moved
55 said friction brake, and sets the loom free

but it is sometimes necessary for mending threads, &c., for the weaver to turn the loom by hand without moving said shipper and to enable the weaver conveniently to do this is the object of the last part of my improve-
60 ments, which consists in combining a treadle or its equivalent with said friction brake in such a manner that the weaver by the pressure of her foot, as she approaches the loom to turn it, can set the said friction
65 brake free.

(*a, a, a,*) represents the frame of the machine; (*b*) the lathe shaft; (*c*) the lathe; (*d*) the take up roller; and (*e*) the yarn
70 beam.

The tension roller or bar (*f*) is deflected as shown in Fig. 11 and vibrates on the arbors (*g, g*) in the stands (*h, h*). The warps pass from the yarn beam (*e*) around the deflected part of the tension roller or bar
75 (*f*) to the take up motion as shown by the red lines. The take up motion should be of the kind known as the "positive take up motion."

(*i*) represents an arm extending inward
80 from the arbor of the tension roller or bar (*f*) and (*j*) is an adjustable weight to give constant tension to the warps.

(*k*) represents another arm extending downward from the arm (*i*) and terminat-
85 ing in a segment of a circle with a brake flange (*l*) projecting from its outer side.

A friction brake for holding the warps firm at the beat of the lathe, vibrates on the stud (*m*) and is in the form of a bent lever,
90 the shipper arm (*n*) forms the brake and is made to conform to the flange (*l*) while the arm (*o*) extends downward and is connected with the sword of the lathe by the rod (*p*) so that when the lathe advances to the cloth
95 it brings the brake arm (*n*) into action.

Having described the mode of giving a uniform tension to the warps, and of holding them firm at the beat of the lathe, and of allowing them to yield freely at the open-
100 ing of the shed, I will now describe the mode of regulating their delivery from the yarn beam.

(*q*) represents the let off shaft, with the worm (*r*) which engages with the cogged
105 wheel (*s*) on the yarn beam in the usual way.

(*t*) represents a crown ratchet which is actuated by the pawl (*u*) on the lever (*v*). The lever (*v*) vibrates on the shaft (*q*) and
110

is moved forward to turn the ratchet (*t*) by the sword of the lathe striking against the rod (*w*) said rod being drawn back for renewed action by the spring (*x*) its return movement being limited by the stop collar (*y*). The action of the pawl (*u*) upon the ratchet (*t*) is modified to regulate the delivery of the warps by the arm or feeler (*z*) which is loosely fitted at one end to the arbor of the tension roller (*f*) so that the other end of it will fall by its own gravity. (*a'*) is another arm which is firmly adjusted to the arbor of said tension roller and has a projection (*b'*) on its outer side extending under the arm or feeler (*z*) as seen in Fig. 1. Now when the warps are used up so as to require more to be given out from the yarn beam, the tension roller (*f*) is drawn forward and the projection (*b'*) raises the arm or feeler (*z*) and allows the spring (*x*) to draw back the rod (*w*) so that when the lathe again falls back it turns the yarn beam. Then again, when more warps are being given out than are wanted at the time, the arm or feeler (*z*) falls down and holds the lever (*v*) in a state of rest until a new demand for warps is made, when it is released as before.

I will now describe the machinery for driving, starting, and stopping the loom.

(*c'*) represents a friction cone affixed to the lathe shaft (*b*); and (*d'*) a belt cone which is operated by the loom belt and runs loosely on the said lathe shaft (*b*). The belt cone (*d'*) is acted upon by the shipping lever (*g'*) which presses the said belt cone against the said friction cone (*c'*) to drive the loom, and withdraws it therefrom to stop the loom. A cross section of these cones and the shipping lever is given in Fig. 14; the face of the friction cone being covered with leather as represented by the red part. To facilitate the oiling of the belt cone (*d'*) when the belt is in motion and to retain the oil on the shaft, the outer end of the shaft hole in the hub of said cone is partly covered so as to form a sort of oil cup, as seen at (*e'*) into which the oil may be introduced through the hole or tube (*f'*) in the shipping lever. The oil thus put on the lathe shaft is liable to work up between the disks of the said two cones on to the leather between their friction surfaces, and unsuitably effect their action. To prevent this I cast, or otherwise put a flange on to the inner side of the disk of each of said cones, which flanges (one being of greater diameter than the other) lap one over the other, thus closing the passage from the said shaft to the said leather or friction surfaces. Partly covering the outer end of the shaft hole in the hub of said belt cone (*d'*) as aforesaid, also furnishes a fair and suitable wearing surface for the shipping lever to act upon, and by pressing the belt cone into

action by this means instead of the groove and fork as heretofore done much wear and tear of the parts is prevented.

The belt cone (*d'*) is drawn out of gear by the lug (*h'*) which is attached to the shipping lever (*g'*) and plays in the groove (*i'*). The shipping lever (*g'*) vibrates on the stud (*j'*) at its rear end, and is connected with the shipper (*k'*) at its forward end which shipper is acted upon by the spring (*s'*) and when liberated from its catch draws the cones apart to stop the loom. A collar on the driving shaft (*b*) is required to keep said shaft from sliding endwise by the pressure of the belt cone (*d'*) against the friction cone (*c'*) or in lieu of a collar, a cap over the opposite end of the shaft such as is represented by (*n'*) may be used.

The friction brake for overcoming the momentum of the loom and arresting it at a convenient stage to change the shuttle, when the loom is thrown out of gear by the weft stop motion, is connected and operated in the following manner.

(*l*) represents the friction brake lever which vibrates on the stud (*m'*) and has one end curved to conform to the periphery of the brake surface of the friction cone *c'* on which it acts while the other end extends forward under the shipper (*k'*) and carries the roller (*o'*). The end of the brake lever which acts on the cone is heavier than the other so that when it is free it falls down clear of said cone.

The shipper (*k'*) vibrates on the stud (*p'*) and works in the stand (*q'*) at its upper end in the usual way, while its lower end projects below the stud (*p'*) and carries the cam (*r'*) which when the shipper (*k'*) is released either by the weft stop motion or the shuttle protector it acts on the roller (*o'*) and brings the brake into action, then when the loom is started again the cam (*r'*) turns and liberates the roller (*o'*) and allows the brake to free itself from the cone by its own gravity. From this it will be seen that the brake comes into action whenever the shipper is released, so that the loom cannot be easily turned to bring it in position for piecing until the brake is withdrawn, which is effected as follows.

(*s*) represents a lever which vibrates on the stud (*t'*), the upper end of which is formed to act like a fork on the roller (*o'*) while the lower end is acted upon through the arm (*v'*) by the foot treadle (*u'*) extending along the front side of the loom. Thus, to release the friction brake and set the loom free, the weaver as she approaches the loom has only to step on the treadle (*u'*) which forces the roller (*o'*) from under the cam (*r'*), when the projection (*w'*) strikes against the end of the brake lever and insures the release of the brake, while the projection (*x'*) prevents the said roller (*o'*)

from rising above the line of the small part of the cam (r') so that when the loom is started again the spring (y') is sure to force the roller (o') under said cam for another operation.

It will be obvious to machinists that the form and arrangement of the parts of the machinery above described may be greatly varied without essentially altering the character of my improvements, and I will now point out some of the modified forms in which I contemplate using them.

Instead of moving the pawl (u) by the top of the sword of the lathe as above described it may be done by a lever connected with the bottom part of the lathe as represented in Figs. 6 and 7. (a'') represents the said lever, and (b'') the stud on which it vibrates, and (c'') the rod by which it is connected with the lathe. The upper end of the lever (a'') acts on the outer end of the lever (v) so that when the lathe falls back it carries the pawl (u) forward to the position shown in Fig. 6, then as the lathe comes forward again it allows the spring (d'') to draw the pawl (u) back as shown in Fig. 7 except when it is arrested by the arm or feeler (z) to regulate the delivery of the warps as aforesaid. I sometimes, also, move the pawl (u) by a cam on the cam shaft or lathe shaft of the loom, which in some cases is the preferable mode as it enables me more perfectly to adapt the time of the motion of said pawl (u) to the other operations of the loom. The arm or feeler (z) for regulating the delivery of the warps instead of having one notch to act on the lever (v) it may have several, one rising a little above the other in succession, and the greater the range of motion given to the pawl (u) at each beat of the lathe, with a corresponding increase in the number of these notches on the arm or feeler (z) the more perfect will be the delivery of the warps.

Instead of a deflected tension roller or bar as represented in Fig. 11, a roller mounted

as represented in Fig. 12 may be used and placed in the loom in the positions respectively shown in Figs. 8 and 10. When placed as shown in Fig. 10 the arm (i) extends outward and the tension weight (j) may be suspended by a rod or strap. In weaving light fabrics the strap from which the tension weight (j) is suspended may be applied directly to the arbor of the tension bar or roller frame (g) and the arm (i) be dispensed with.

The socket of the shipping lever (g') which acts on the end of the hub of the belt cone (d') as aforesaid, may be lined with "Babbitt metal"; and to supersede the necessity of accurate adjustment of said shipping lever a part of it may be made in the form of a spring.

Having described my improvement and pointed out some of the modified forms in which I intend to apply them, what I claim as new therein and desire to secure by Letters Patent is—

1. Connecting the tension roller or its equivalent with the let off motion to regulate the delivery of the warps by the arm or feeler (z) substantially as specified.

2. I also claim the devices for holding the tension roller or its equivalent firmly at the beat of the lathe substantially as described.

3. I also claim the mode of constructing the belt cone and combining it with the shipping lever substantially in the manner and for the purposes specified.

4. I also claim the mode of connecting the friction brake with the shipper and stop motions of the loom substantially in the manner and for the purposes set forth; and I finally claim releasing the said friction brake to allow the loom to be turned by hand substantially as specified.

ERASTUS B. BIGELOW.

Witnesses:

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