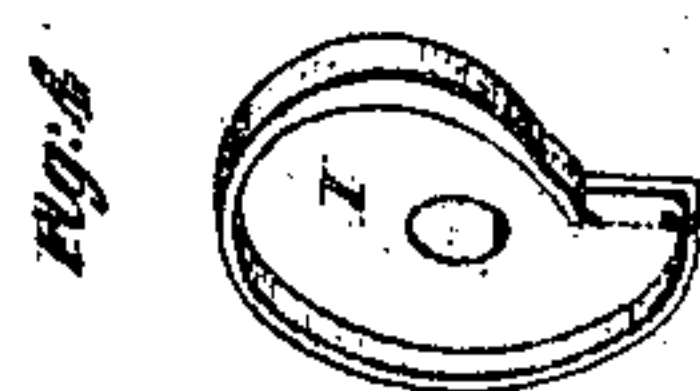
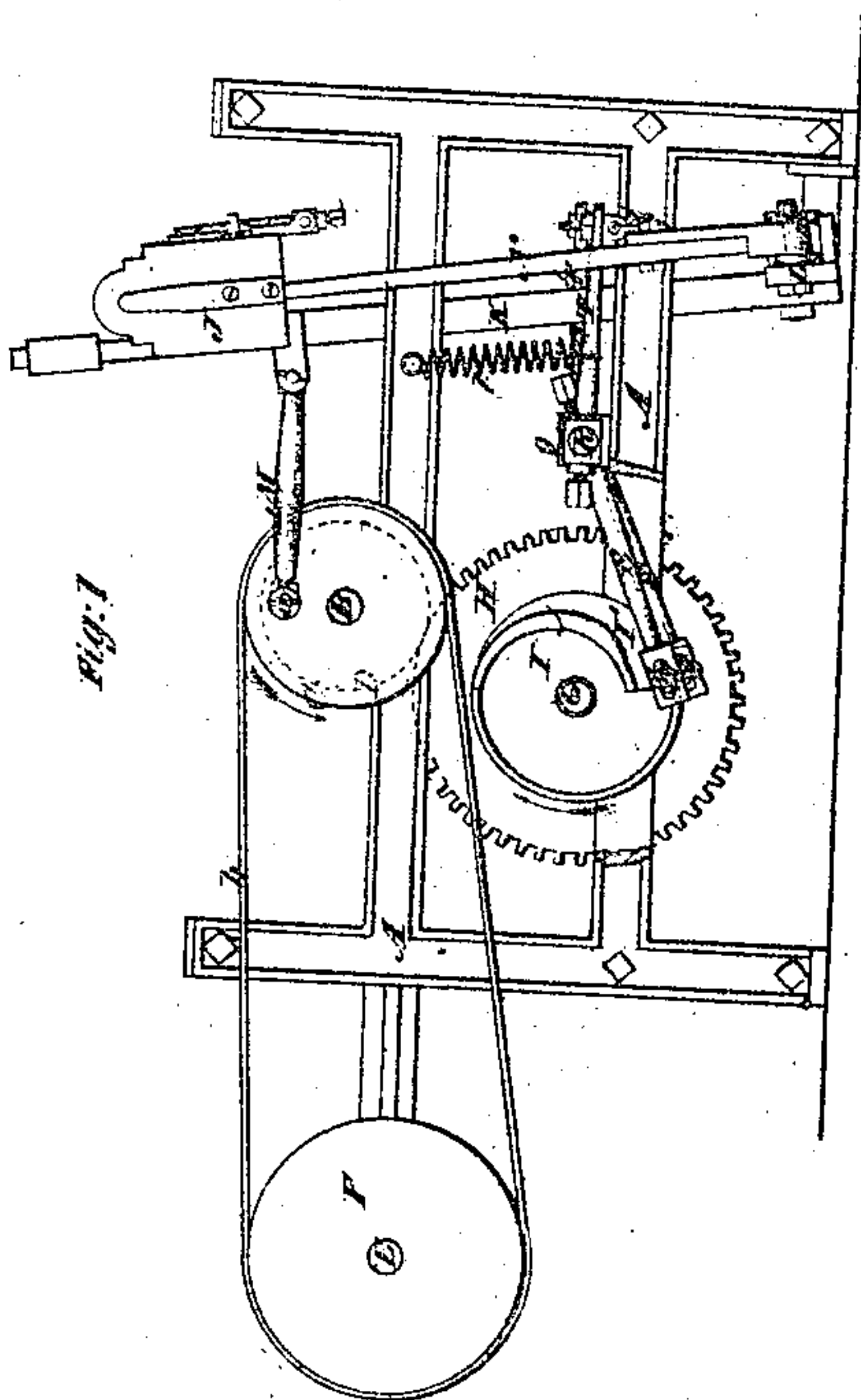
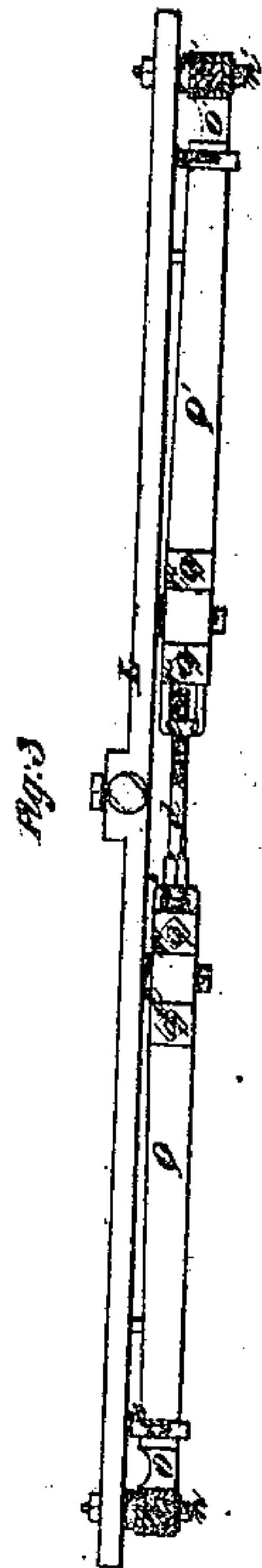
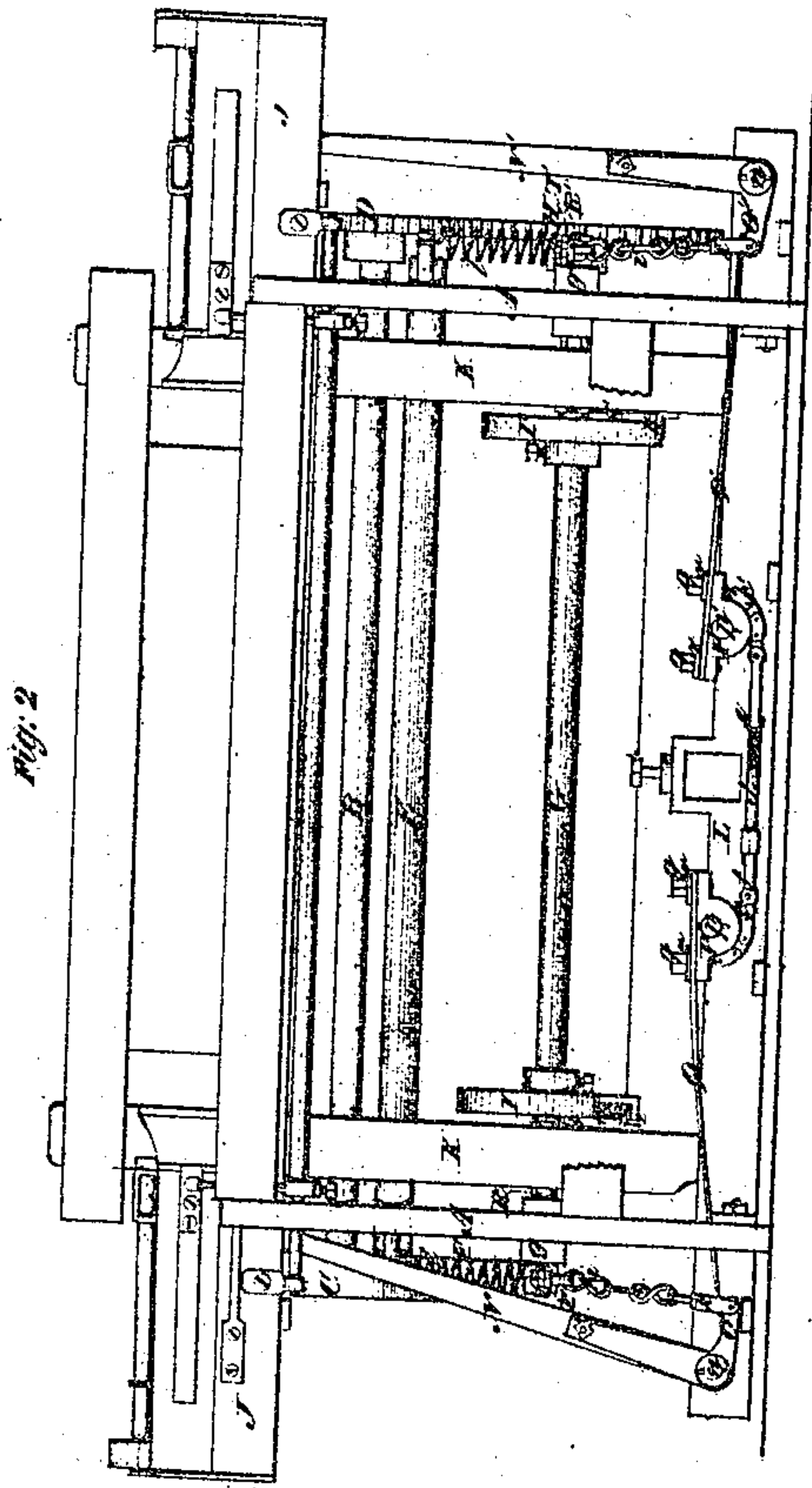


T. T. Wilcox,
Shuttle Motion for Looms.
No. 7803. Patented Nov. 26. 1860.



UNITED STATES PATENT OFFICE.

THOS. T. WILLCOX, OF NORWICH, CONNECTICUT.

SHUTTLE-MOTION IN LOOMS.

Specification of Letters Patent No. 7,803, dated November 26, 1850.

To all whom it may concern:

Be it known that I, THOMAS T. WILLCOX, of Norwich, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in the Power-Loom; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a side elevation, a part of the framing being represented as broken away to show the cams. Fig. 2, is a front elevation, having part of the frame broken to show the cams. Fig. 3, is a plan of the rocker detached from the loom, showing the adjustable springs for operating the picker staves. Fig. 4, is a detached view in perspective, of one of the cams.

Similar letters of reference indicate corresponding parts in each of the several figures.

My invention consists first in an improved method of regulating the operation of the picker staves, so as to throw the shuttles with greater or less force as may be required; the picker staves are operated so as to throw the shuttle, by means of flat bar springs, attached to oscillating boxes, which are mounted on fixed centers, attached to the rocker, the ends of the springs bearing on short levers attached to the picker staves; the lower sides of the oscillating boxes are of semicircular form and are attached together by chains which are provided with a regulating screw, for the purpose of lengthening or shortening them and regulating the force exerted by the springs.

It further consists, in forming the cams for operating the levers which draw back the picker staves, in such a manner, as to prevent damage to the warp or to the mechanism, in case of the motion of the loom being accidentally reversed.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, A, represent the frame of the loom.

B, is the main shaft. It carries a pulley C, and a toothed wheel D, close to its ends; the pulley C, and the toothed wheel D, each carry a stud *a* serving as a crank pin.

E, is a shaft carrying a pulley F, which communicates rotary motion by a band *h*, to the pulley C.

G, is the cam shaft; it carries a toothed wheel H, having double the number of teeth of the toothed wheel D, into which it gears, causing the cam shaft G, to make one revolution for every two of the main shaft B. The cam shaft G, also carries the scroll cams I, I¹, set with their prominent parts diametrically opposite to each other; these cams are formed of plates of metal having a rim all around them except at the fall or that part between the terminations of the larger and smaller diameters represented by 1, 2, (the form of the cams is most clearly shown in Fig. 4).

J, is the lay; it is attached by swords K, K, to the rocker L, which rocks on centers attached to the frame; the lay is attached by a pitman M, to each of the pins *a*, on the pulley C, and toothed wheel D, and receives its motion by the revolution of the main shaft, in the ordinary manner.

N, N¹ are the picker staves which vibrate on fixed centers *n*, *n*¹, secured in the rocker L.

O, O¹, are short levers attached to the picker staves.

P, P¹, are metal boxes fitted so as to rock or oscillate freely on fixed centers *p*, *p*¹, secured to the rocker L; the upper sides of the said boxes are flat surfaces, the lower sides are of semicircular form.

Q, Q¹, are flat steel springs secured by screw bolts *q*, *q*, and plates *r*, *r*, to the upper sides of the boxes P, P¹, the outer ends of the springs bear on the ends of the short levers O, O¹, attached to the picker staves, and always have a tendency to throw the picker staves forward.

c, *c*¹, are chains attached to the semicircular parts of the boxes P, P¹.

d, is a screw attached by a swivel *f*, to the chain *c*.

e, is a nut attached by links to the chain *c*¹, the screw *d*, is inserted in the nut *e*, and is capable of being turned easily in the swivel *f*, when the screw *d*, is screwed into the nut *e*, the distance between the points of attachment of the chains *c*, *c*¹, is shortened and the boxes P, P¹, will be caused to turn slightly on their centers *p*, *p*¹, the springs Q, Q¹, will thus be brought to bear with greater force on the ends of the levers O, O¹.

R, R¹, are short spindles mounted in bearings *g*, *g*¹, attached to the frame. S, S¹, are levers fast on the spindles R, R¹, they are

provided at or near their ends with pins or studs h , h^1 , upon which the cams I , I^1 , operate.

T , T^1 , are levers fast on the spindles R , R^1 . They are attached by chains i , i^1 and stirrups k , k^1 , to the ends of the levers O , O^1 .

l , l^1 , are helical springs for the purpose of keeping the chains i , i^1 , tight and holding up the levers T , T^1 , when the cams I , I^1 , are not acting on the studs h , h^1 .

The operation is as follows: Rotary motion communicated to the main shaft B , will operate the lay in the usual manner, and will also by means of the toothed wheels D , H , transmit rotary motion to the cam shaft G , (the direction in which the shafts rotate is pointed out in the drawings by speed arrows) one revolution being made by the shaft G , for every two of the shaft B . The cams I , I^1 , in their revolutions will bear on the studs h , h^1 , and force down the ends of the levers S , S^1 , raising the ends of the levers T , T^1 , and overcoming the pressure of the springs Q , Q^1 , will raise the ends of the levers O , O^1 , and throw back the picker staves N , N^1 , until the points 2, in the cams pass the studs h , h^1 , the resistance to the pressure of the springs Q , Q^1 , being then suddenly removed will cause the said springs Q , Q^1 , to press down the levers O , O^1 , and the picker staves will be thrown suddenly forward, throwing the shuttle through the warp; the cams being set in the manner before described, with their most prominent parts diametrically opposite each other, will operate the picker staves alternately, at regular intervals, precisely at the proper moment for passing the weft through the warp; the springs Q , and Q^1 , being attached to the metal boxes P , and P^1 , which are capable of oscillating on the pins p , and p^1 , and united by chains so as to move together in the same direction, will exert an equal power on each of the picker staves throwing the shuttle with an equal force in each direction in the drawings the cam I , is represented as just having cleared the pin h , and the shuttle is supposed to have been thrown into the right hand shuttle box ready for operation in the opposite direction.

When it is required to give a greater or less pick, that is, to throw the shuttle with greater or less force, it is necessary to screw up or unscrew the screw d , in the nut e , so as

to cause the springs Q , Q^1 , to exert exactly the amount of power required to throw the shuttle. If the direction of the revolution of the shafts should by any accidental cause be reversed, all danger of damage to the warp, or to the mechanism of the loom, will be prevented, by the form and construction of the cams, I , I^1 , which will cease actuating the mechanism for throwing the shuttle; it will be observed by reference to Fig. 2 in the drawings, that the pins or studs h , h^1 , do not reach across the entire width of the rims of the cams, and if the motion of the cams should be changed, the studs will pass inside the rim through the opening in the fall at 1—2, and the cams may perform their entire revolution without actuating the picker staves. It is obvious that if the space between 1—2, in the fall of the cam were closed, any backward motion of the shaft must cause great damage and destruction to the mechanism of the loom.

By regulating the power applied to the picker staves in the manner described, and by the easy action of the springs Q , Q^1 , caused by attaching them to the oscillating boxes P , P^1 , I am enabled to work the loom at a greatly increased speed, and I have worked a loom with this motion attached at the rate of two hundred and fifty picks in a minute, insuring the operation of the shuttle with the greatest accuracy. I may here observe that the oscillation of the boxes P , P^1 , is so slight as to be scarcely perceptible.

Having now described my invention, I will now state what I claim and desire to secure by Letters Patent. I do not claim operating the picker staves by means of springs, as that is an old and well known contrivance, but,

I claim—

The boxes P , P^1 , oscillating upon fixed points p , p^1 , and having the flat bar springs Q , Q^1 , attached to them, in combination with the claims c , c^1 , and the regulating screw d , and nut e ; for giving a more free and easy motion to the picker staves, and for the more effectually controlling and graduating the amount of pick.

THOMAS T. WILLCOX.

Witnesses:

OLIVER P. WATTLEY,
GEORGE M. ROBERTS.