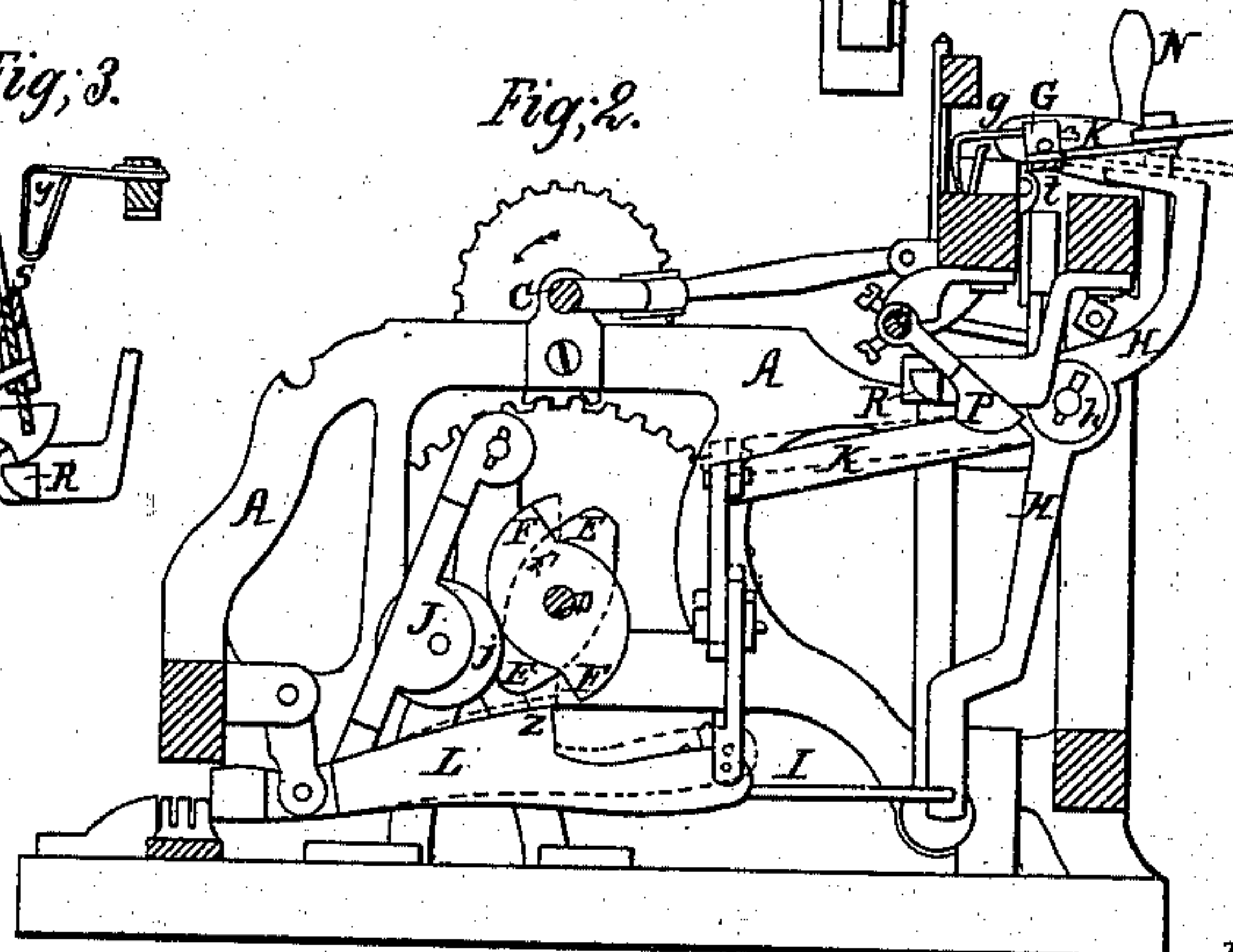
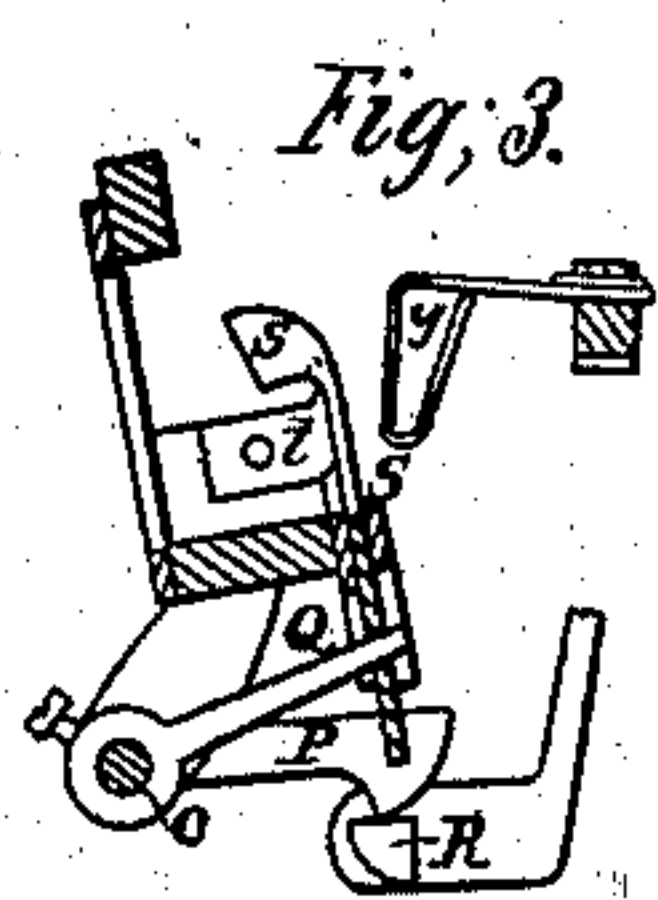
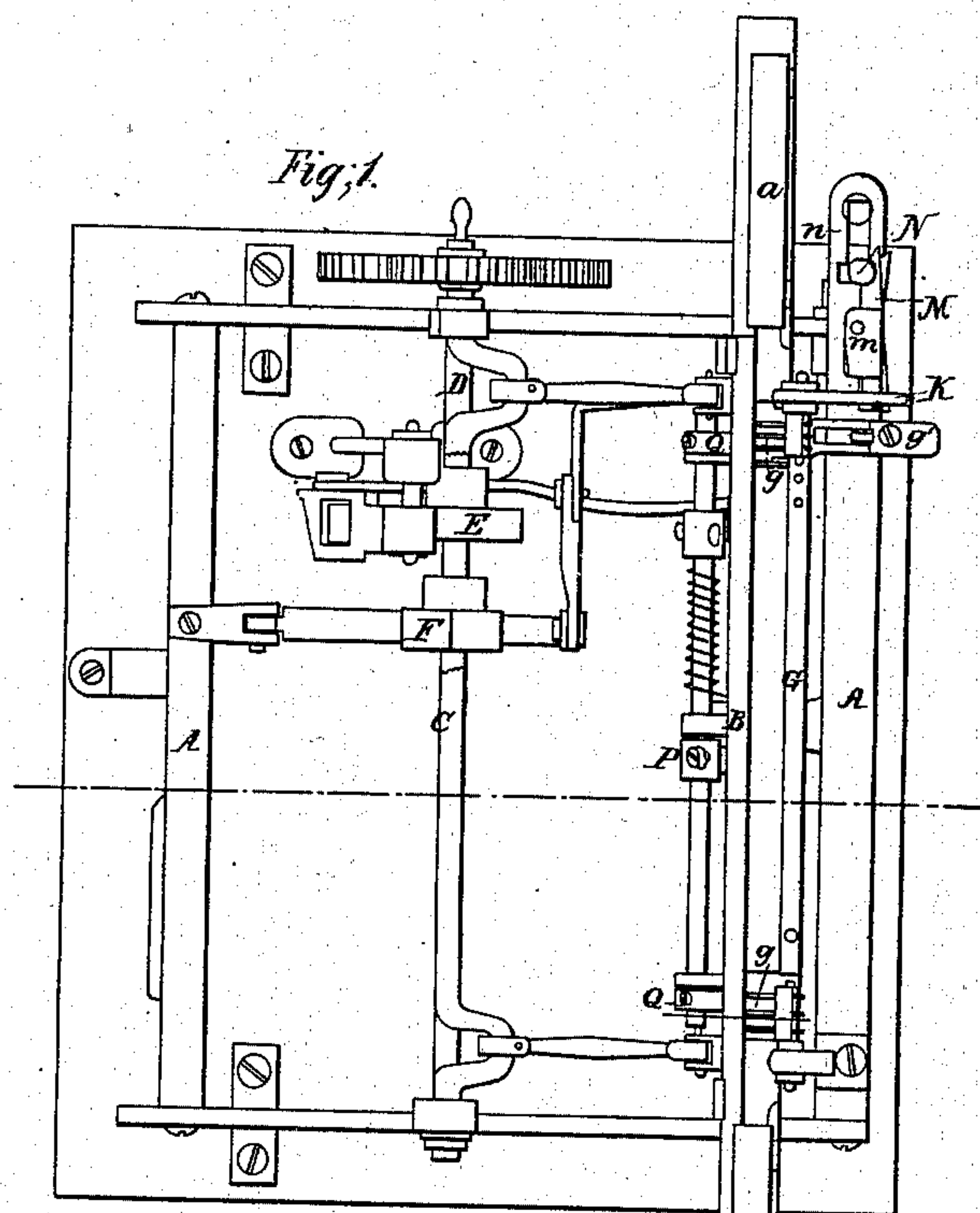


W. GRAICHEN & C. HOFFMAN.
LOOM.

No. 32,269.

Patented May 7, 1861.



Witnesses;
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LOOM.

Specification of Letters Patent No. 32,269, dated May 7, 1861.

To all whom it may concern:

Be it known that we, WILLIAM GRAICHEN and CHARLES HOFFMAN, both of Clinton, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Looms; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a plan illustrative of our improvement. Fig 2, is a vertical section at x, x . Fig. 3, is a fragmentary section at y, y , showing a different position of the parts.

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

The subject of our improvement is a device, applied to looms employing a series of shuttles, for the purpose of arresting the motion of the machinery in the event of either thread breaking or running out as will be hereinafter explained.

A, is the frame of the loom.

B, is the lay which may be of any construction suitable for use with drop boxes.

a, a , represent the shuttle boxes.

C, is the main crank shaft.

D, is a shaft geared to rotate at one half the speed of the shaft C, and carrying a pair of cams E, E, and a pair of stops F, F, to arrest the motion of the machinery under certain conditions.

G, is a horizontal shaft pivoted in the stationary frame and provided at each end with a set of arms g, g , projecting forward and downward and formed with vertical fronts and oblique backs as clearly shown in Figs. 2, and 3.

g' , is a slotted arm projecting backward from the shaft G, and engaging over the upper end of a lever H, fulcrumed at h .

I, is a connecting rod attached at its respective ends to the lever H, and a pivoted hanger J. The cams E, acting upon a friction roller j , in the hanger J, draw the lower end of the lever H, forward at every revolution of the main crank shaft C. The shaft G, is at one end pivoted to the upper end of a bent lever K, fulcrumed on the same stud shaft with the lever H, and attached at its lower end to a horizontal bar L, pivoted at its rear end in a hanger from the main frame and formed on its upper side with a shoulder l , against which the stops F, impinge

when the bar L, is elevated as hereinafter explained.

M, is a short horizontal lever fulcrumed at m , to the main frame and engaging at one end in an aperture in the upper end of the lever K. N, represents a spring belt shipper or bar to communicate therewith, which while the machine is in operation is held in a yoke n , in the position shown by black lines in Fig. 1, but on the bar G, and lever K, being drawn forward by the disconnection of the thread or depletion of the bobbin (as will be hereinafter explained) is by the outer end of the lever M, thrown out of its detaining notch and then by its own resilience or that of a spring applied to it, acts through any suitable mechanism (not here shown) to throw the driving belt and thus disconnect the motive power.

O, is a horizontal shaft, pivoted beneath the shuttle race and provided at its center with a cam P, and at each end with an arm Q, all rigidly but adjustably attached to the shaft. The cam P, works over a stationary pin R, so as to oscillate the shaft O, upon its axis at each motion of the lay. The arms Q, Q, actuated by the motion of the shaft impart a vertical vibratory motion to plates S, S, sliding in suitable ways and carrying hooks s , projecting upward on each side of the arms g .

t, t , represent stationary hooks projecting upward from the shuttle race, outside the edges of the web to prevent the displacement of the thread as hereinafter explained.

Operation: The directions in which the shafts rotate are represented by arrows. As the work of weaving progresses the weft thread extending from the sides of the webs to the shuttles in the boxes impinges against the arms g , at every forward motion of the lay raising the arm g' , and by this means disconnecting the shaft G, from the lever H, so that so long as the weft thread is duly laid the bent lever K, is left at rest, and the regular operation of the loom continues in regular course. When however the thread breaks or the bobbin is depleted the arm g' , by its gravity falls over the lever H, and connects the shaft with the lever, so that the continued forward movement of the upper end of the lever imparts a simultaneous movement to the bent lever K, which casts off the driving belt through the medium of the short horizontal lever M, and spring

shipper N, and at the same time raises the bar L, so that its shoulder engages with one of the stops F, and instantly arrests the motion of the machine.

- 5 The operation above explained is similar in many respects to that of attachments in common use for disconnecting the motive power in the event of the breakage of the thread, or of the depletion of the bobbin.
- 10 In looms for fancy weaving however, devices previously used have been found inefficient owing to the fact that a number of threads at the same time extend from the webs to the shuttle boxes, the continuity of any one of
- 15 which threads will serve to prevent the disconnection of the motive power. In our invention this difficulty is avoided by trying every thread singly as soon as thrown. The mechanism by which this is accomplished
- 20 operates as follows: At each backward motion of the lay the cam P, rising upon the pin R, throws up the hooks *s*, into the position represented in Fig. 3, causing them to seize the threads stretched from the web to
- 25 the shuttle boxes and as the lay again moves forward to drag them down below the reach of the arms *g*, while a thread thrown subsequently to the action of the hooks acts upon the said arms and unless broken or expended
- 30 prevents the disconnection of the power.

The hooks *t*, serve to prevent the displacement of the threads in the web during the above described action of the hooks *s*.

The inclined backs of the arms *g*, (clearly represented in Figs. 2 and 3) adapt them to 35 clear themselves readily in the forward motion of the lay in the event of either of them engaging above the threads.

To prevent the possibility of a thread slipping over the back of the arm the back is 40 turned over backward at top or may be extended up closely to the horizontal portion.

By employing a set of arms *g*, at each end of the shaft G, the effect is produced equally well by threads extending on either side of 45 the web.

What we claim as new and of our invention herein, and desire to secure by Letters Patent, is:—

1. The vibrating hooks *s*, operating in con- 50 nection with the rock shaft G, and arms *g*, or their equivalents in manner substantially as and for the purpose set forth.

2. The combination of the levers H, K, and M, spring shipper N, bar L, cams E, 55 and stops F, constructed arranged and operating in the manner and for the purposes set forth.

The above specification of our improvement in looms signed this eighth day of Feb- 60 ruary 1861.

WM. GRAICHEN.
CH. HOFFMAN.

Witnesses:

OCTAVIUS KNIGHT,
L. W. BENDRÉ.