

(No Model.)

2 Sheets—Sheet 1.

G. A. HAAS.

CONVERTIBLE WEFT AND WARP SPINNING FRAME.

No. 351,636.

Patented Oct. 26, 1886.

Fig 1.

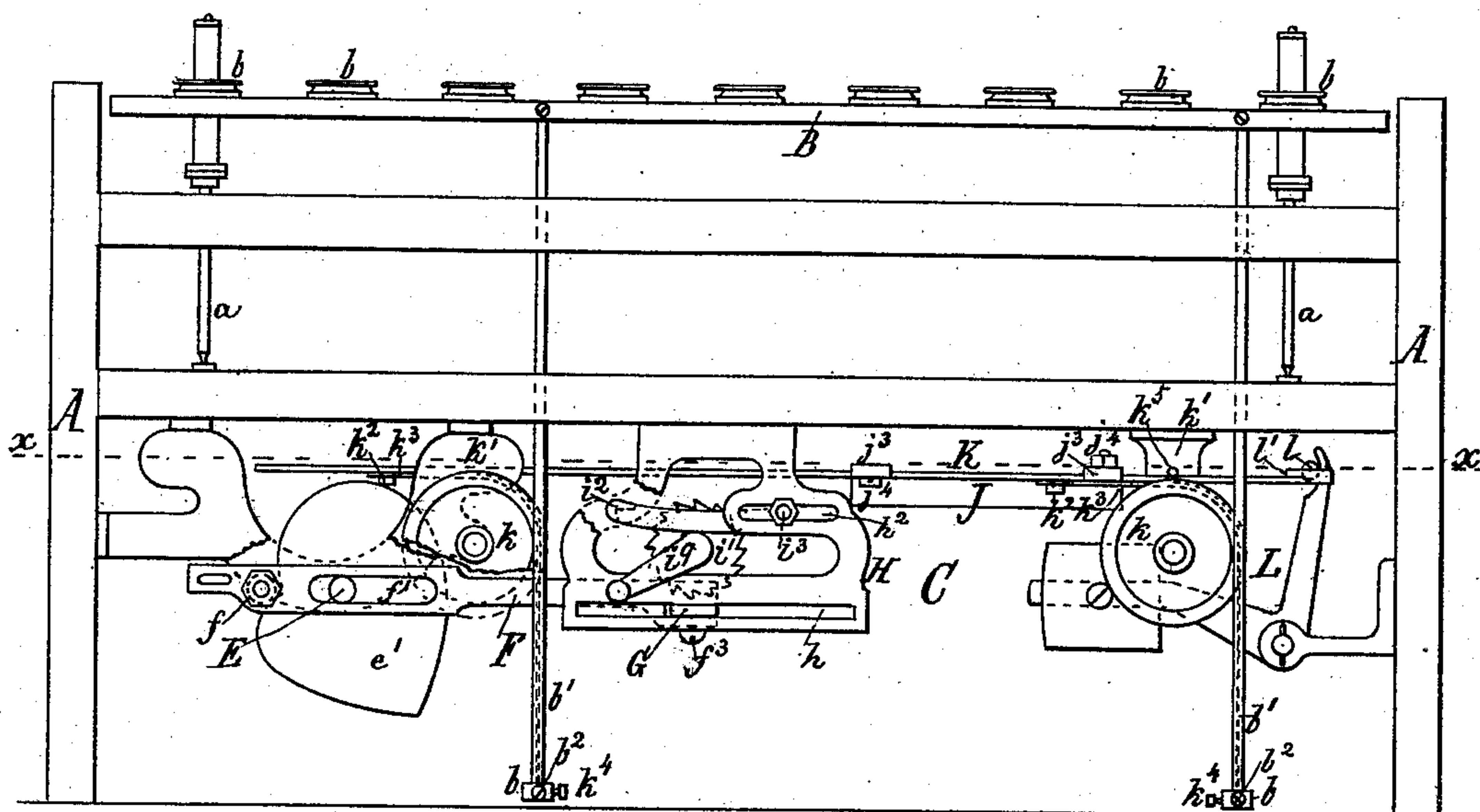
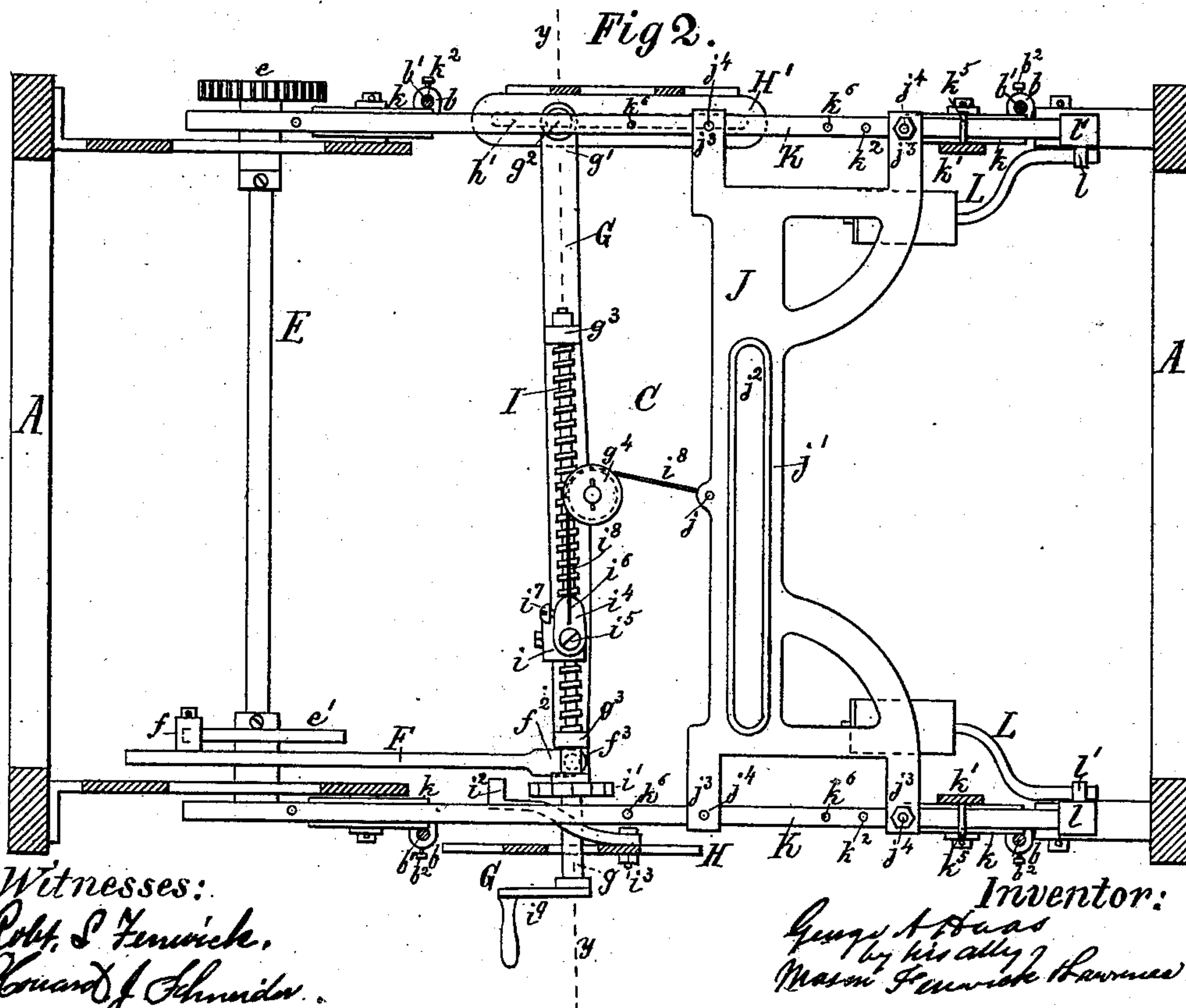


Fig 2.



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2 Sheets—Sheet 2.

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Fig 3.

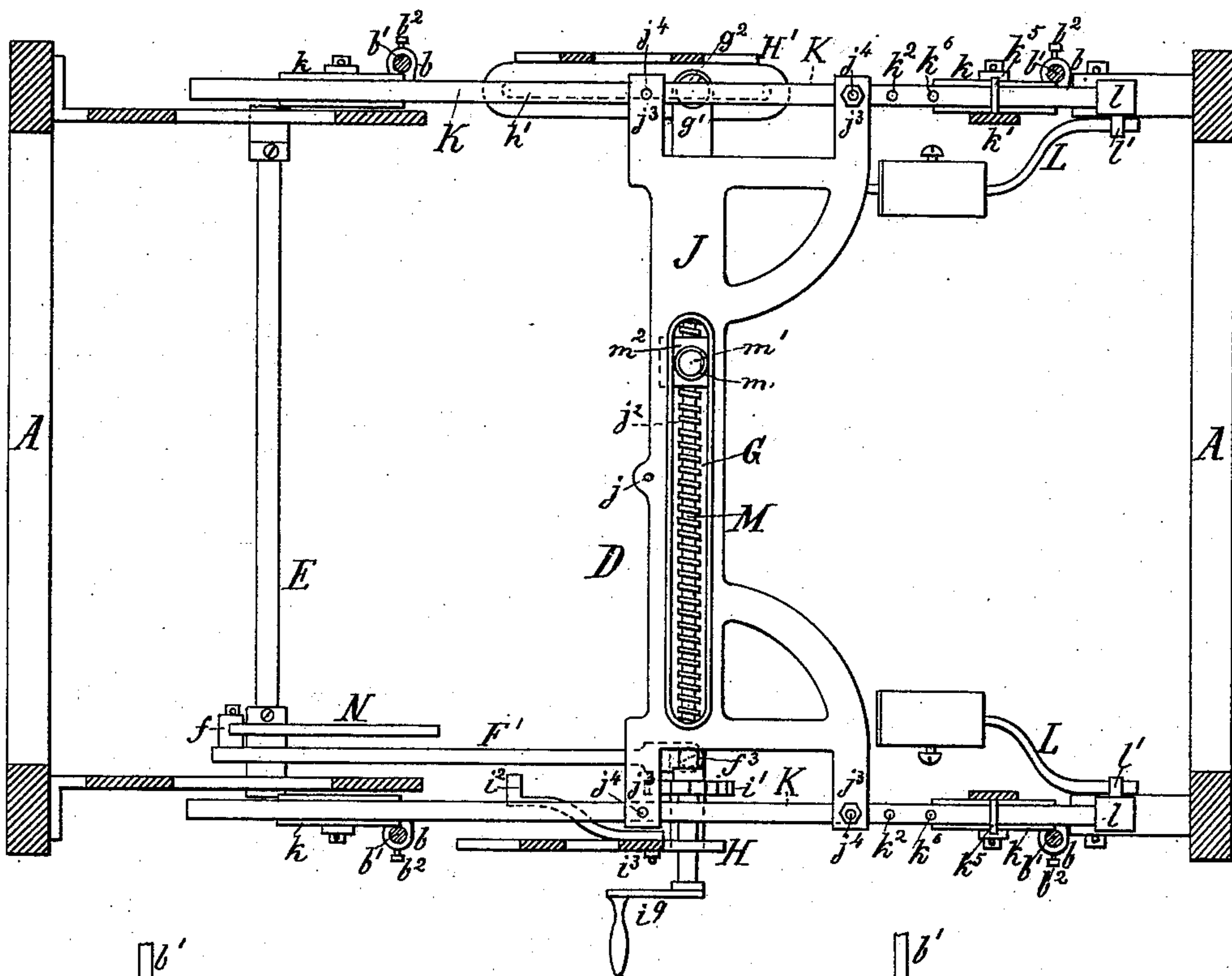


Fig 4.

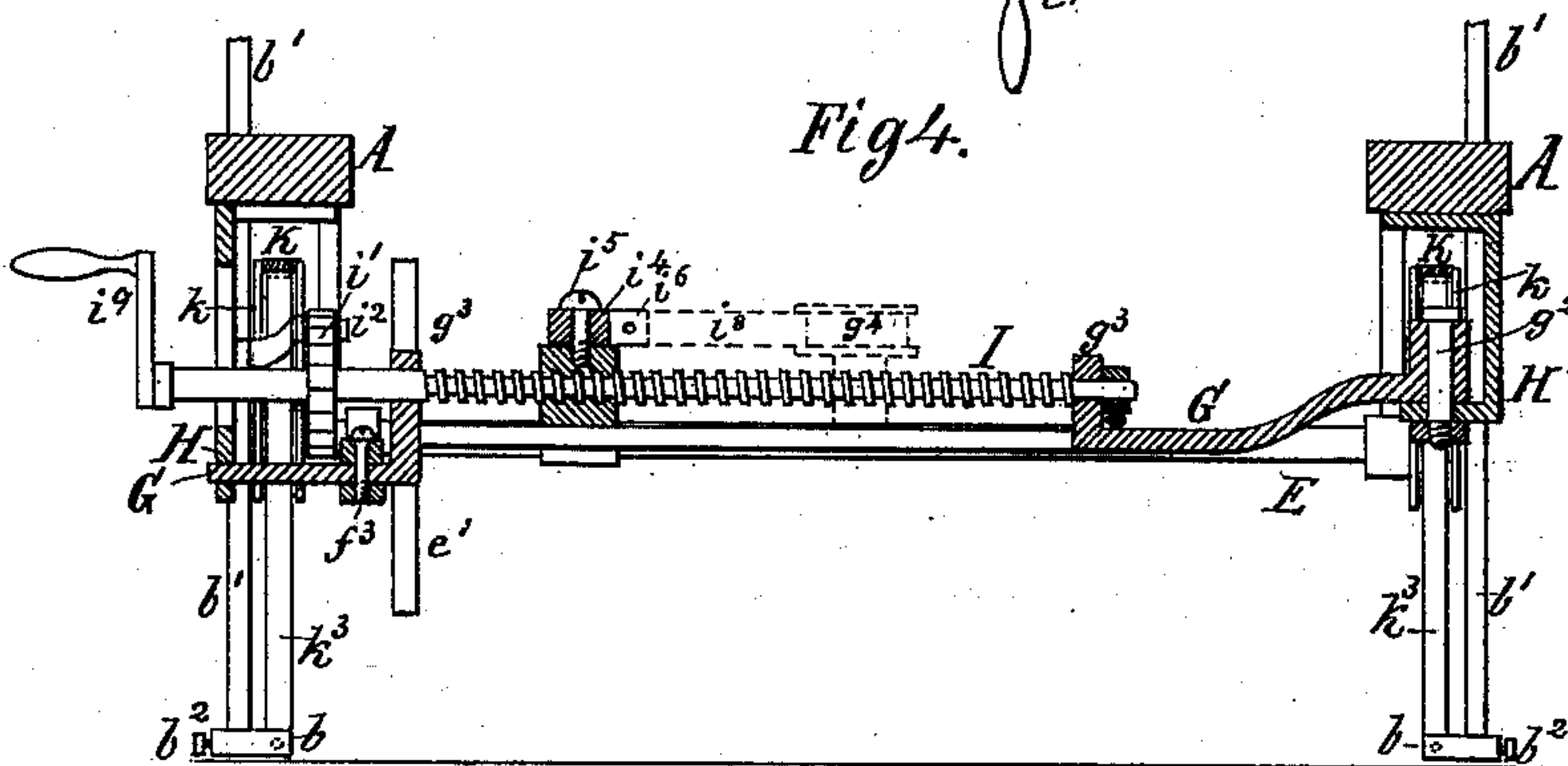


Fig 9.

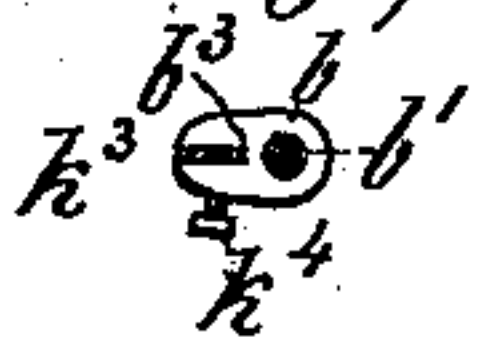


Fig 7.

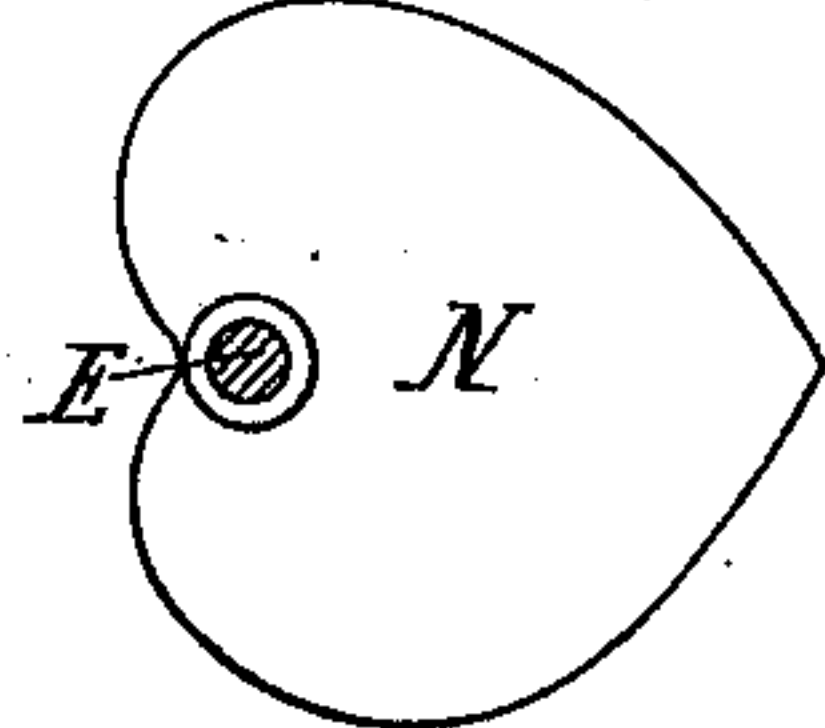


Fig 5.

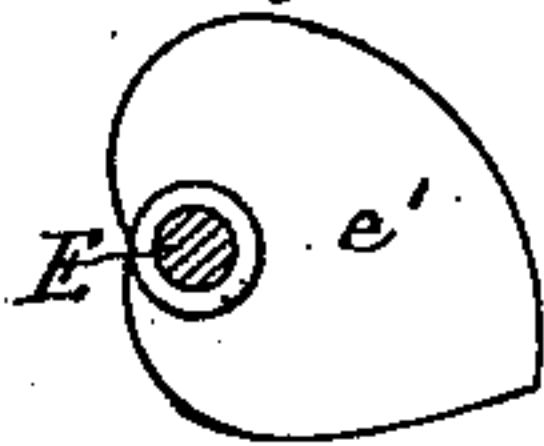


Fig 6.

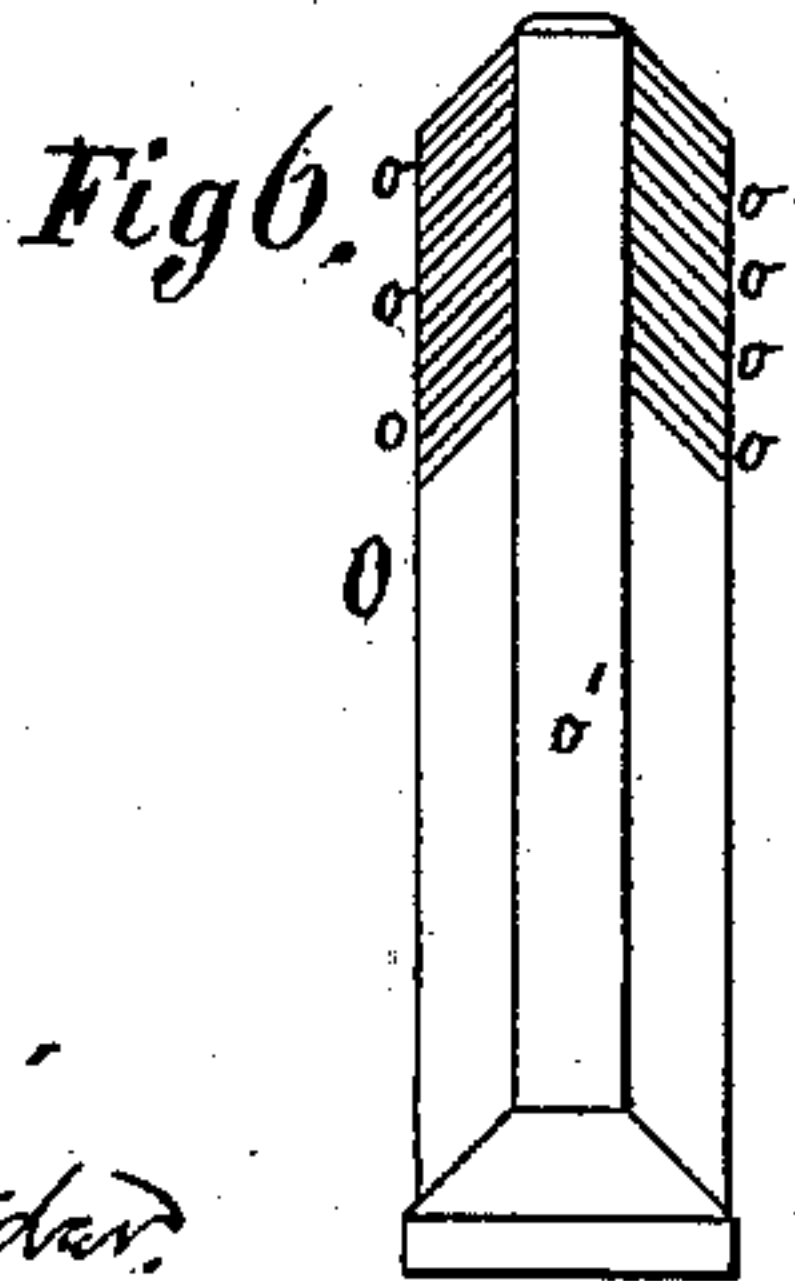
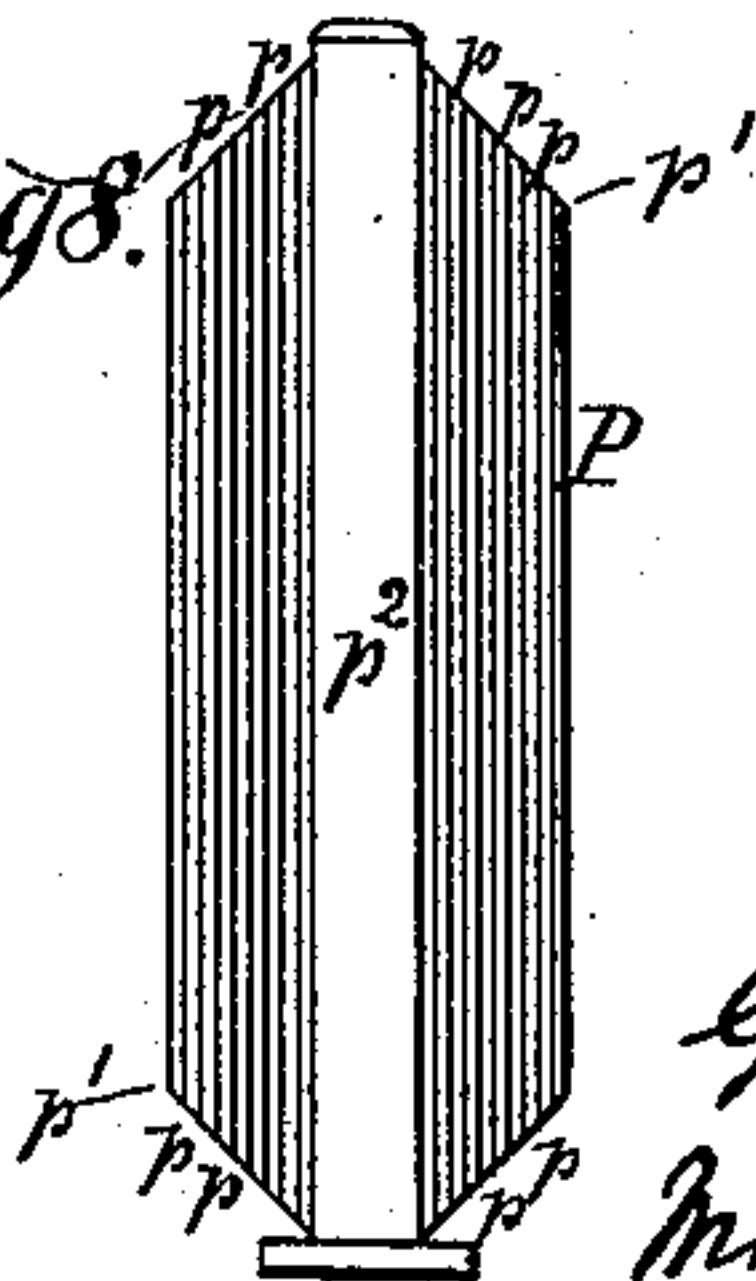


Fig 8.



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UNITED STATES PATENT OFFICE.

GEORGE A. HAAS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
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CONVERTIBLE WEFT AND WARP SPINNING FRAME.

SPECIFICATION forming part of Letters Patent No. 351,636, dated October 26, 1886.

Application filed June 28, 1886. Serial No. 206,430. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. HAAS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Convertible Weft and Warp Spinning Frames; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists of a spinning-frame comprising certain novel constructions and combinations of parts, as will be hereinafter described and specifically claimed, whereby a convertible mechanism for moving the ring-rails of the machine is provided, which by certain changes, can be adapted for making alternately weft yarn or warp yarn.

The object of my invention is to do away with the use of two spinning-frames, one for spinning weft and the other for spinning warp, and to adapt a single spinning-frame for both purposes alternately, and thus save a great deal of room, as well as avoid expense to the manufacturer of weft and warp yarns.

In the accompanying drawings, Figure 1 is a front view of a portion of a spinning-frame as improved by me and as used for making weft, parts of the supporting-hangers being broken away in order to better expose to view the working parts in the rear thereof. Fig. 2 is a horizontal section of the same in the line xx of Fig. 1. Fig. 3 is a similar section showing the mechanism as used for making warp. Fig. 4 is a vertical section in the line yy of Fig. 2. Fig. 5 is an elevation of a cam used with the mechanism for making weft. Fig. 6 is a diagram of a weft-bobbin and its yarn load wound by the aid of said cam. Fig. 7 is an elevation of a cam used with the mechanism for making warp, and Fig. 8 is a diagram of a warp-bobbin and its load wound by the aid of said cam. Fig. 9 is a detail view, partly in plan and section, of one of the band-clamps used on the vertically-oscillating ring-rail rods.

A in the drawings represents an ordinary spinning-frame; B, ring-rail; C, mechanism used in making weft, and D mechanism used in making warp.

The frame A is of ordinary construction, and is provided with spindles a , rings b , ring-rails B, and other ordinary machinery for operating the movable parts.

In Figs. 1 and 2 the machinery shown is adapted for spinning weft and the mechanism employed for the purpose of vertically reciprocating the ring-rails and also winding the bobbins in proper shape, as will be seen. The said mechanism receives motion by means of a toothed wheel, e , of a cam-shaft E, from the usual "change" gears provided on spinning-frames. The cam-shaft, which is suitably hung to the frame A, is provided with a cam, e' , which operates a roller, f , on a sliding rod, F. The sliding rod F is provided with a guide-slot, f' , by means of which it slides on the cam-shaft E, and a forked head, f^2 , which is pivoted by means of a pin, f^3 , to a lever-arm, G. The front end, g , of the lever-arm G is supported in a guide-slot, h , of a suitable hanger, H, of the frame A, while the rear or fulcrum end, g' , is pivoted at g^2 to a suitable hanger, H', of the frame, which hanger is provided with a longitudinal slot, h' , in which the pivot g^2 can be adjusted. The lever-arm G is provided with a screw, I, suitably hung between bearings g^3 of the lever-arm, and to said screw a nut, i , is secured, which is fitted partly around the said lever-arm, and is thus caused to move in a straight line when the screw I is turned. The front portion of the screw I is provided with a ratchet-wheel, i' , which is, by the motion of arm G, moved against a pawl, i^2 , adjustably pivoted by means of a threaded pin, i^3 , having a nut, and a slot, h^2 , in the hanger H. The front end of the screw I is provided with a crank-handle, i^4 , for the purpose of turning the screw by hand, as will be seen. To the top of the nut i a band-clamp, i^5 , is pivoted by means of a pivot, i^6 , and this clamp i^5 is provided with a slot, i^7 , and a clamp-screw, i^8 . The end of a steel band, i^9 , is inserted into the slot i^7 and clamped tightly therein by the screw i^8 . Near its center the arm G is provided with a guide-pulley, g^4 , around which the steel band i^9 passes toward a movable cross-brace, J, to which it is suitably fastened at j . This cross-brace J consists of a flat beam, j' , having

a slot, j^2 , and branching portions terminating with end flanges, j^3 , which latter are, by means of bolts j^4 , fastened to two horizontal longitudinal flat bars, K. These bars K are supported upon flanged guide-pulleys k , suitably supported by hangers k' , or otherwise, and at their lower sides they are provided with clamp-screws k^2 , holding steel bands k^3 to the bars, which steel bands run over the pulleys k , and thence down to clamp-heads b , provided on the lower ends of vertically-oscillating rail-rods b' of the ring-rails B. The clamp-heads b are fastened by means of set-screws b^2 to the rods b' , and they are provided with slots b^3 , (see Fig. 9,) into which the ends of the steel bands k^3 are inserted, and to which they are fastened by means of set-screws k^4 . The weight of the ring-rails is in a great measure counterbalanced by pivoted weighted crank-levers L, suitably attached to the frame and bearing against rounded projections l of lugs l' , suitably secured to the ends of the bars K. The bars K are prevented from leaving the pulleys k opposite the weighted levers L by pins k^5 , fastened to the hangers k' , and being barely in contact with the upper surfaces of the said bars. The bars K are provided with screw-threaded holes k^6 for the purpose of receiving the bolts j^1 , there being two sets of such holes, one set occupied by the said bolts, as shown in Fig. 2, and the other set by the bolts, as shown in Fig. 3, thus permitting the brace J to be fastened to the bars K in two different positions, as circumstances require.

The position of the brace J (shown in Fig. 3) is the one it occupies when the spinning-frame is adapted for making warp-yarns, and while in this position the band i^8 is not necessary, the slot j^2 being brought directly in line with a screw, M, and is occupied by a roller, m , pivoted at m' to a nut, m^2 , which takes the place of the nut i on the left-handed screw M which has been substituted for the right-handed screw I, (shown in Figs. 1 and 2,) attached to the lever-arm G. In connection with this adjustment of the parts of the spinning-frame the ratchet-wheel i' of the screw I is properly attached to the left-handed screw M, so as to be operated by the pawl i^2 , the crank-handle i^9 being fastened to the front end of the screw M. Said screw, by said handle, may be operated by hand, for the purpose hereinbefore set forth.

The sliding rod F (shown in Figs. 1 and 2) is replaced by a similar but longer sliding rod, F' , which performs the same functions—*i. e.*, that of causing the lever-arm G to oscillate in accordance with the peripheral formation of the revolving cam on shaft E. The roller f is operated by a cam, N, substituted for the cam e' on the shaft E. The roller f is held against the cam N by the superior weight of the ring-rails over the counterbalancing-weight of the levers L, and thus the ring-rails are moved up and down at the rate of the speed of the revolving cam, which is on the shaft E.

When the machine is arranged, as shown in

Figs. 1 and 2, for the purpose of making weft, the cam e' causes the lever-arm G to oscillate and move the ring-rails up and down in such manner that the yarn load (O shown in Fig. 6) is built up by conical layers o of the weft, as required for weaving purposes, each pair of the layers o being formed during a revolution of the cam e' , and after each revolution of said cam the ratchet-wheel i' being turned by the pawl i^2 a certain distance, and the nut i thereby moved a slight distance forward, and the cross-brace J brought nearer to the lever-arm G, it will be apparent that the ring-rails are slightly raised after the formation of each pair of layers o , and thus provision is made for the correct formation of the succeeding layers o , and this goes on until the bobbins are of the required size, when the machine is stopped, the bobbins removed, fresh bobbins o' provided in the usual manner, and the screw I, by means of the crank-handle i^9 , turned backward until the nut i is moved to its place of starting, whereupon the machine is set to work again.

When the machine is arranged for making warp, as shown in Fig. 3, the cam N on the shaft E causes the lever-arm G to oscillate and move the cross-brace J forward and backward, thereby raising and lowering the ring-rails. This causes the formation of a yarn load, P, as shown in Fig. 8, composed of cylindrical layers p of yarn. At every revolution of the cam N the ratchet-wheel i' is moved by the pawl i^2 , thereby causing the nut m^2 to move a slight distance toward the fulcrum j^2 of the lever-arm G, and thereby decreasing the stroke of the roller m , cross-brace J, and ring-rails B. In consequence of this decrease of strokes the yarn loads are shaped with conical end portions, p' , as seen in Fig. 8. When the yarn-loads P have attained their proper size, the machine is stopped, the filled bobbins p^2 are removed, fresh bobbins p^2 provided, and by means of the crank i^9 the screw M is turned backward until the nut m has arrived at its starting-point, whereupon the machine is set in motion again to repeat its operation.

What I claim as my invention is—

1. A spinning-machine provided with a cam, e' , sliding connecting-rod F, adjustable lever-arm G, means, substantially as described, for adjusting said lever-arm, screw I, means, substantially as described, for rotating said screw, connecting-band i^8 , guide-pulley g^1 , nut i , sliding supporting-bars K, adjustable brace J, means, substantially as described, for adjusting the brace on its supports K with respect to the lever-arm G, ring-rails B, and ordinary intermediate connecting mechanism between the bars and said ring-rails, substantially as and for the purpose described.

2. A spinning-machine provided with a cam, N, connecting-rod F' , adjustable lever-arm G, means, substantially as described, for adjusting said lever-arm, screw M, means, substantially as described, for rotating said screw, roller m , nut m^2 , sliding supporting-bars K, slotted brace J, made adjustable on its sup-

ports K, means, substantially as described, for adjusting the brace with respect to the lever-arm G, ring-rails B, and ordinary intermediate connecting mechanism between the bars K and said ring-rails, substantially as and for the purpose described.

3. The combination of a screw and nut, substantially as described, with the following parts of a spinning-frame, to wit: adjustable vibrating lever-arm G, supporting-bars K, having two sets of adjusting-holes, k^2 , brace J, having slot j^2 , and screw-bolts j^4 , and which is adjustable on its supporting-bars K in respect to lever-arm G, means described for connecting the nut of the screw with the brace J, ratchet and pawl, a cam, a connecting-rod leading from the cam to the said lever-arm, ring-rails B, and ordinary intermediate connecting mechanism between the bars K and said ring-rails, substantially as and for the purpose described.

4. The combination of the slotted brace J, having bolt-holes and bolts j^4 , adjustable piv-

oted lever-arm G, means, substantially as described, for adjusting said lever-arm, screw I, having a handle, band i^8 , pulley g^4 , nut i , bars K, straps k^3 , pulleys k , rail-rods b' , rails B, slotted hangers H H', ratchet i' , pawl i^2 , cam-rod F, cam e' , and shaft E, substantially as and for the purpose set forth.

5. The adjustable brace J, provided with a slot, j^2 , and bolt-holes, in combination with the bars K, provided with two sets of holes, as k^2 , bolts j^4 , the pivoted lever-arm G, slotted hangers H H', screw M, having a handle, roller m , nut m^2 , ratchet i' , pawl i^2 , cam N, connecting-rod F', shaft E, pulleys k , straps k^3 , rail-rods b' , and rails B, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE A. HAAS.

Witnesses:

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WM. R. NICHOLSON.