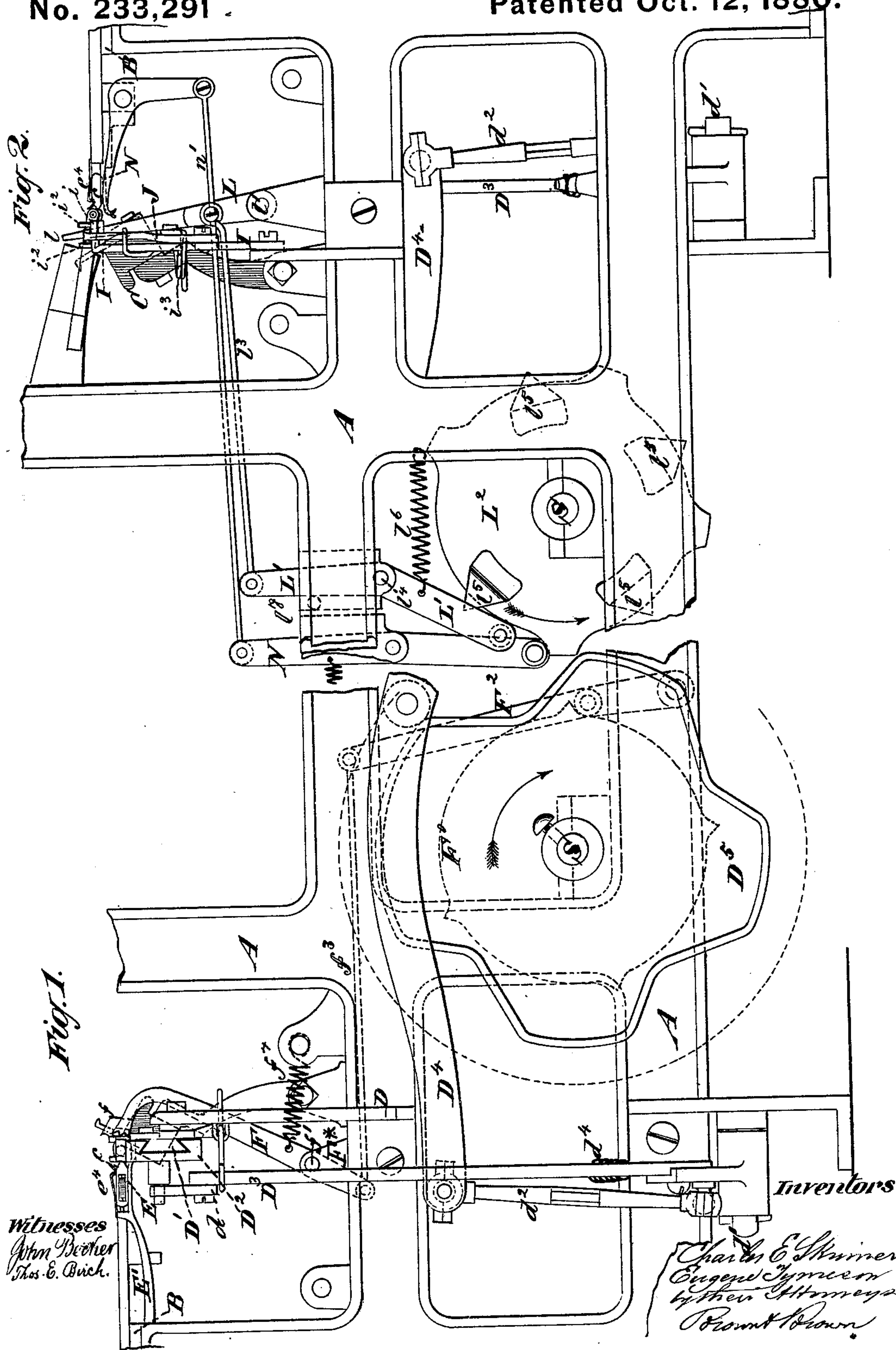


5 Sheets—Sheet 1.

No. 233,291

Patented Oct. 12, 1880.



N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

5 Sheets—Sheet 2.

No. 233,291.

Patented Oct. 12, 1880.

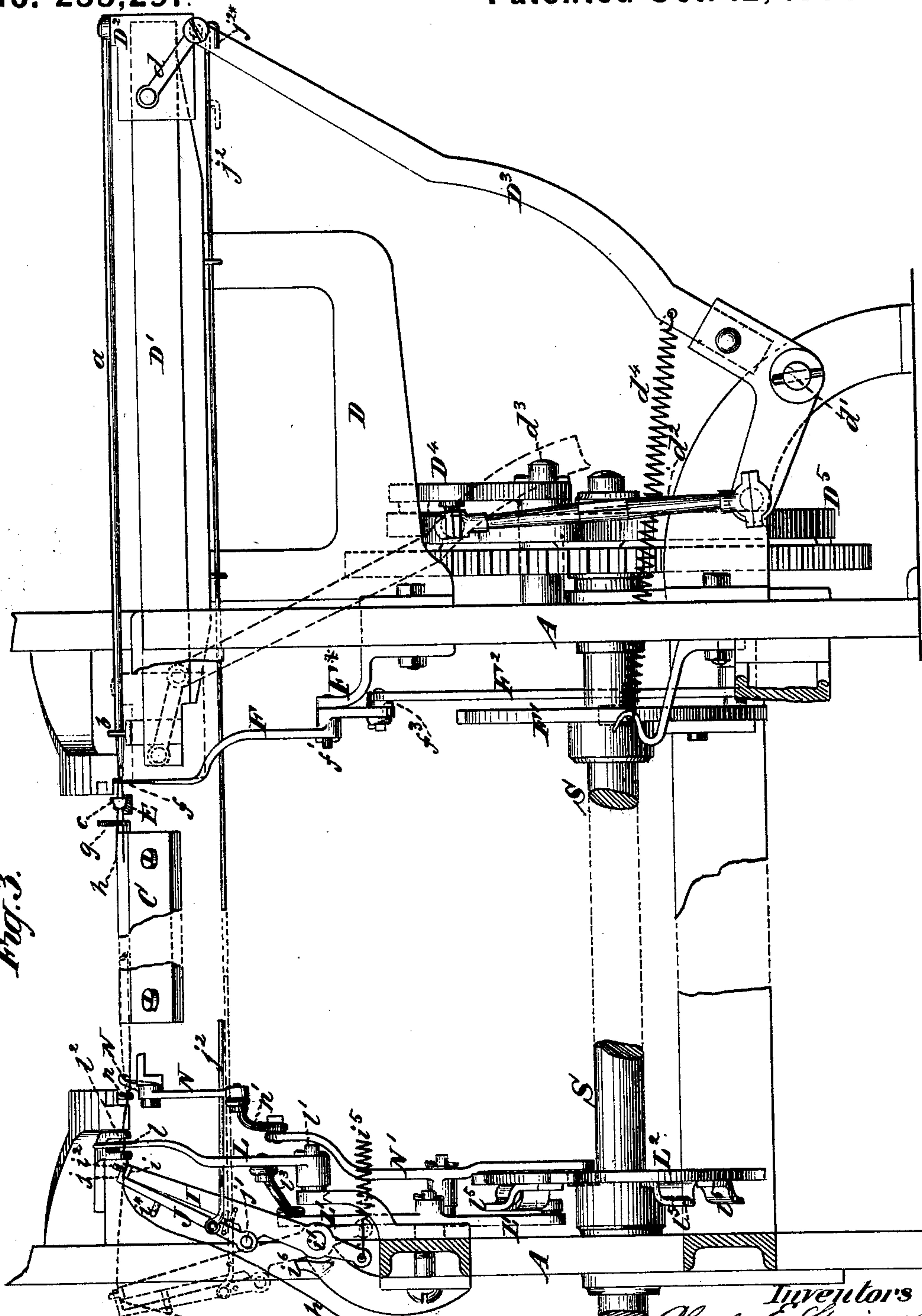


Fig. 3.

Witnesses
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Charles E. Skinner
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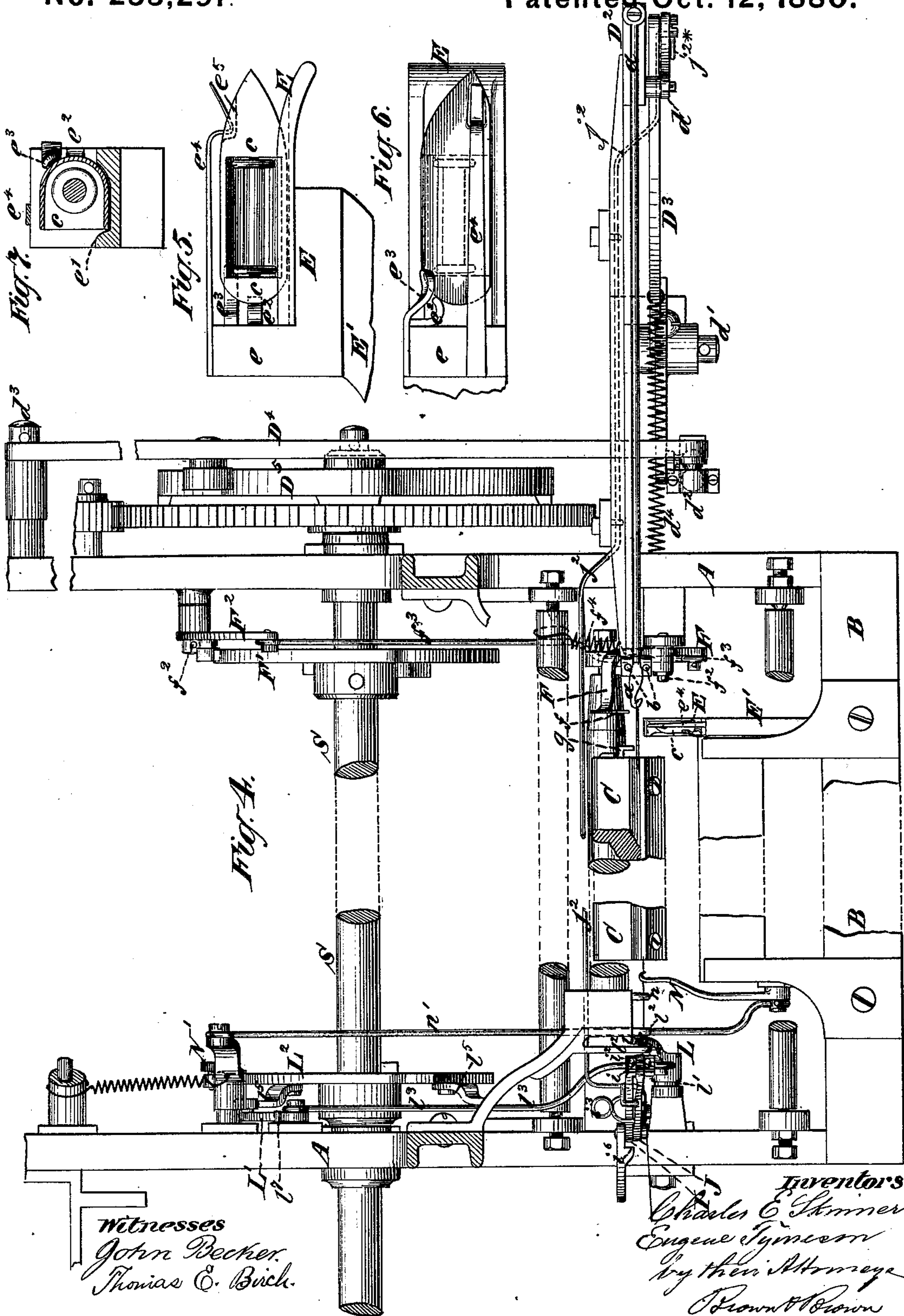
(No Model.)

5 Sheets--Sheet 3.

C. E. SKINNER & E. TYMESON.
Needle Loom

No. 233,291.

Patented Oct. 12, 1880.



(No Model.)

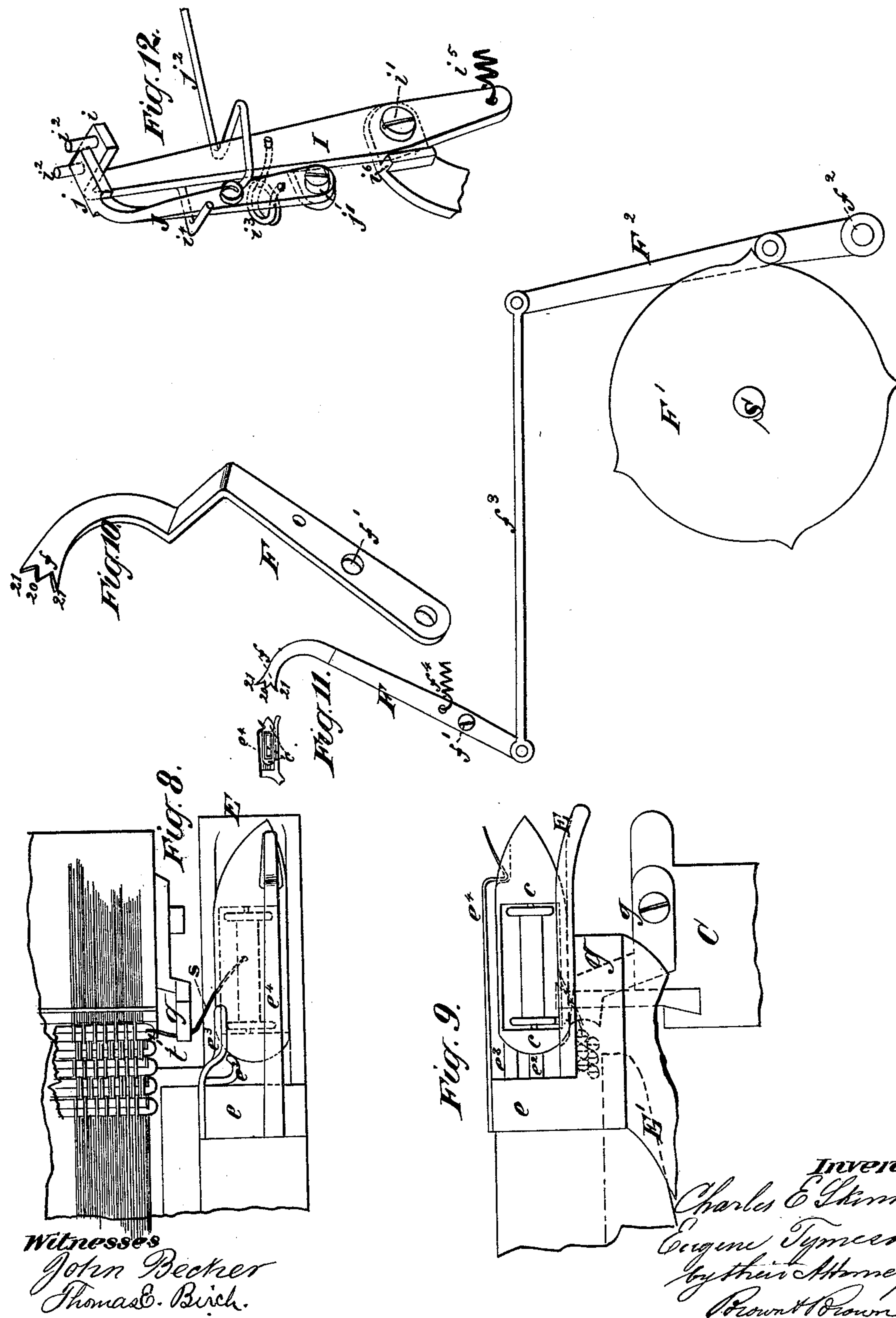
5 Sheets—Sheet 4.

C. E. SKINNER & E. TYMESON.

Needle Loom.

No. 233,291.

Patented Oct. 12, 1880.



N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

(No Model.)

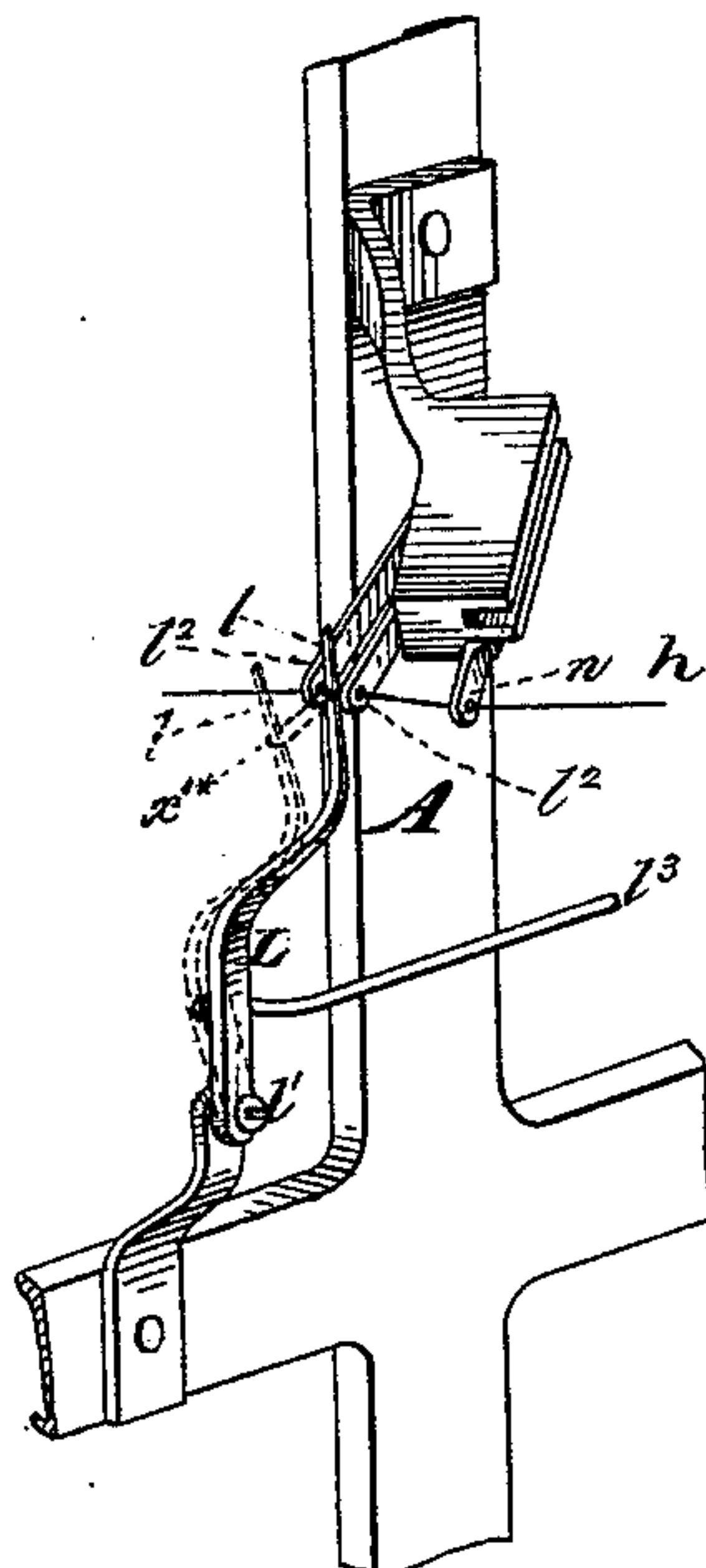
5 Sheets--Sheet 5.

C. E. SKINNER & E. TYMESON.
Needle Loom

No. 233,291

Patented Oct. 12, 1880.

Fig. 13.



Witnesses:-

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UNITED STATES PATENT OFFICE.

CHARLES E. SKINNER AND EUGENE TYMESON, OF YONKERS, NEW YORK.

NEEDLE-LOOM.

SPECIFICATION forming part of Letters Patent No. 233,291, dated October 12, 1880.

Application filed June 4, 1880. (No model.)

To all whom it may concern:

Be it known that we, CHARLES E. SKINNER and EUGENE TYMESON, both of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Needle-Looms; and we do hereby declare that the following is a specification of the same, reference being had to the accompanying drawings.

This invention relates to what are termed "needle-loom," in which the weft-carrying device which passes the weft through the warp consists of a needle. In such looms a shuttle is employed to insert into the loop formed by the doubling of the weft or filling thread a selvage-thread, which retains and secures the filling. Such shuttles have sometimes had motion imparted to them and have sometimes been stationary. We employ a stationary shuttle; and our invention consists in the combination, with the weft-carrying needle and the stationary shuttle and its stationary bearing, of a transferring-finger having a reciprocating motion, preferably vibratory, in a direction parallel with the warp, for the purpose of transferring or carrying the loop of the filling over the said shuttle for the reception of the selvage-thread.

Another feature of our invention consists in the combination, with the said stationary shuttle, of a finger attached to or arranged near and moving with the lay and reed for the purpose of drawing the selvage-thread from said shuttle, and of evening the said thread at the selvage of the fabric.

Our invention also includes a movable weft-clamp and weft-tightening finger, both arranged on that side of the loom from which the weft or filling is taken into the warp by the needle—viz., the opposite side to that on which the selvage-shuttle is situated, for the purpose of taking up the slack of the loops formed in the weft or filling for the passage of said shuttle, and of tightening the filling around the selvage-threads.

Figure 1 is a right-hand side view of such parts of a loom as are necessary to illustrate our invention. Fig. 2 is a left-hand side view of the same. Fig. 3 is a front view of the same, partly in section, and showing the central portion of the loom broken away to enable

the side parts to be shown nearer together. Fig. 4 is a plan corresponding with Fig. 3. Fig. 5 is a side view of the stationary shuttle and its holder on a larger scale than the previously-described figures. Fig. 6 is a top view corresponding with Fig. 5. Fig. 7 is a transverse vertical section corresponding with Figs. 5 and 6. Fig. 8 is a plan view of the shuttle, stationary shuttle-bearing, part of the lay, and the finger attached to the lay for drawing the selvage-thread from the shuttle, illustrating the operation of drawing the selvage-thread from the shuttle and evening the selvage formed by said thread. Fig. 9 is a side view corresponding with Fig. 8. Fig. 10 is a perspective view of the finger for carrying the loops of the filling over the shuttle. Fig. 11 is a side view of said finger and its operative mechanism. Fig. 12 is a perspective view of the weft or filling clamp. Fig. 13 exhibits a perspective view of the weft-tightening finger and the fork which coacts with it.

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

A is the framing of the loom, and B is the breast-beam. C is the lay, which may be worked in the usual way.

D is a bracket secured to the right-hand side of the loom for supporting the stationary horizontal slide D', upon which works the carriage D², to which is attached the hooked weft or filling needle *a*, which draws in the filling *h* from the opposite side of the loom, the said needle working between fixed guide-pins *b b*, secured to the said slide D'.

D³ is the lever, and *d* the connecting-rod for working the needle-carriage, the said lever working on a fixed fulcrum, *d'*, and being connected, by a rod, *d*², with a lever, D⁴, which works on a fixed fulcrum, *d*³, and is operated upon by a cam, D⁵, on the cam-shaft S, for the purpose of driving the needle across the loom from left to right, the return movement of the needle being produced by a spring, *d*⁴, connecting the lever D³ with some fixture on the loom. This needle-operating mechanism is the same as in other needle-loom, and is only so far described as to enable its parts to be distinguished from the parts which constitute our invention.

E is the principal portion of the stationary

shuttle-holder, secured, by a rigid arm or bracket, E' , to the breast-beam of the loom, near the right side thereof. The position of this shuttle-holder is such that it stands near the right-hand end of the lay when the latter completes its forward movement. The selvage-thread shuttle c is of a form commonly employed for the purpose, and the shuttle-holder consists of the seat-piece E , having an upward projection, e , at its front end, and having in its upper surface a shallow trough-like cavity or seat, e' , (see Figs. 5, 6, and 7,) in which the shuttle may lie with its length parallel to the warp in the loom, and with its point toward the rear of the loom, as shown in Figs. 1 and 4. Attached to the upward projection, e , there are two horns, e^2 and e^3 , and a spring, e^4 , (see Figs. 5, 6, and 7,) the horn e^2 serving as a bearing for the heel of the shuttle, the horn e^3 serving as a guard for the upper part of the heel, and the spring e^4 entering a notch, e^5 , in the upper part of the nose of the shuttle, the said spring e^4 and the guard e^3 serving to prevent the shuttle from jumping or being thrown out of its seat e' , and the spring e^4 allowing the shuttle to rise from its seat e' sufficiently to allow the loop of the double shot of filling h , drawn through the shed by the needle a , to pass between it and the seat e' .

f is the transferring-finger for carrying over the stationary shuttle c the loop of the double filling h . This finger, which is shown in Figs. 1, 3, 4, and 11, and in the perspective view, Fig. 10, forms part of, or is firmly secured to, a small lever, F , which works backward and forward on a fixed fulcrum at f' on a fixed bracket, F^* , secured to the loom-framing. The said finger has its extremity in the shape of a three-pronged fork, and it works outside of the shuttle near to and parallel with the straight outer vertical side thereof, its path being such that the point of its central prong, 20, works in a path which takes it close by the hooked point of the needle a after the latter has been drawn back with the filling and close by the point of the nose of the shuttle, by which means the said prong is caused to enter the loop of the filling on the needle and take the said loop from the needle and pass it over the shuttle, the loop being somewhat spread for the reception of the shuttle by the abrupt taper of the prong 20, and being prevented from escaping from the said prong by the two outer prongs, 21. The operation of producing the passage of the shuttle through the loop of the filling is performed by this transferring-finger f without any longitudinal movement of the shuttle, and without any other movement than the slight rise from its seat e' , produced by the passage under it of the lower part of the loop of the filling as the said loop is carried under, over, and past the shuttle by the said transferring-finger f . The forward movement of the said finger, by which the transferring of the loop over the shuttle is effected, is pro-

duced by means of a cam, F' , on the ordinary cam-shaft S of the loom acting upon a lever, F^2 , which works on a fixed fulcrum, f^2 , and which is connected, by a rod, f^3 , with the finger-lever F . The backward movement of the said finger is produced by a spring, f^4 .

g is the finger for drawing out the selvage-thread from the shuttle c , (represented as rigidly secured to the right-hand end of the lay C .) This finger is forked, as shown in Fig. 9, to insure its catching the portion of the shuttle-thread between the fell and the shuttle, and every time the lay beats up the said finger catches said portion of the shuttle-thread, which is indicated by s in Figs. 8 and 9, and pulls it forward.

The tension produced on the shuttle-thread by the ordinary tension devices in the shuttle is such that the said finger, before drawing any more thread from the shuttle, will, just before the lay completes its beat, draw out from the selvage any portion of the shuttle-thread that may have been drawn thereinto by the loop t of the last shot of filling inserted into the warp, and so cause the selvage-thread furnished by the shuttle to be parallel with the warp, after which sufficient thread will be drawn by the said finger from the shuttle to carry on the selvage to the next succeeding shot of filling.

The movable weft-clamp, arranged at the left side of the loom, from whence the weft or filling is supplied to the needle from a spool arranged in the usual way for that purpose, consists of two small levers, I J . The lever I , which is best shown in Figs. 3 and 12, and is also shown in Figs. 2 and 4, works parallel with the lay and breast-beam or crosswise of the loom on a fixed fulcrum, i' . Its upper end is so bent or constructed as to form the lower jaw, i , of the weft-clamp, and is furnished with two pins or upward projections, i^2 , (see Fig. 12,) to prevent the filling from getting astray. The lever J , which is pivoted, by a pin, j' , to the lever I , so that it works, to a certain extent, independently of the latter in the same direction, has its upper end so bent or constructed as to form the upper jaw, j , of the clamp, and to work between the projections i^2 on the lower jaw, i , the position of the said pin j' being so far outward that the outward movement of the lever J independently of I raises the upper jaw, j , and opens the clamp to liberate the filling within it. A spring, i^3 , is applied between the levers for the purpose of opening the clamp, and a stop, i^4 , is attached to the lever I , to limit the independent outward movement of J and prevent the opening of the clamp farther than is necessary to liberate the filling. The clamp is worked by a rod, j^2 , one end of which is connected with the lever I , and which reaches right across the loom to near the end of the needle-carriage slide D' , as shown in Fig. 3, and the other end of which is hooked, as shown at j^{2*} in that figure, or otherwise so constructed that a lit-

the before the filling-needle a completes its outward movement the lever D^3 , or some other part of the needle-operating devices, will catch the said rod and pull it to the right, causing it first to close the clamp on the filling and afterward to draw the clamp inward. This operation of the rod on the clamp is resisted by a spring, i^5 , which is so applied to the lever I below its fulcrum as to tend to throw outward the upper end of the said lever. This spring, which holds back the clamp against a fixed stop, i^6 , (shown in Fig. 3,) until the proper time for its inward movement, also insures the closing of the jaws before its movement commences.

The above-described operation of the clamp is to clamp the filling securely while the backward or outward movement of the needle is completed, and also for a time after the completion of said movement and until the loop of the filling has been taken from the needle and carried over the shuttle by the transferring-finger f , and during the operation of the weft-tightening finger l , which will now be described.

The weft-tightening finger l , represented as a simple straight and stiff piece of metal, (see Figs. 2, 3, and 4,) consists of, or is attached to, the upper part of a lever, L , which is situated between the clamp $I J$ and the adjacent side of the warp, and which works backward and forward with the warp on a fixed fulcrum l' . The said finger works between the two prongs of a stationary fork, l^2 , secured to the loom-framing, the prongs of the said fork containing eyes through which the filling h passes in front of the said finger on its way into the warp. The said lever L is connected, by a rod, l^3 , with a lever, L' , which works on a fixed fulcrum, l^4 , on the back part of the loom, and which is operated upon, after the insertion of each shot of filling, to press forward the said lever L and finger l , by means of the wings l^5 on a cam, L^2 , on the cam-shaft S , the finger being, until the proper time for its operation, held stationary within the fork l^2 by means of a spring, l^6 , which holds the lever L' against a stop, l^7 , (shown dotted in Fig. 2,) on the loom-framing. The forward movement of the weft-tightening finger l within and out of the fork l^2 takes place after the loop of the filling has been carried forward off the shuttle, and after the transferring-finger f has moved back, and while the filling is firmly held by the clamp $I J$, and as the said finger l moves forward within and out of the fork it pulls the filling h forward in the form of a loop, w'^* , as shown in dotted outline in Fig. 13, between the eyes of the fork, thereby drawing back that part of the filling which is in the warp, and so drawing the filling tight up into the selvage on the right-hand side of the loom. After the finger l returns into the fork l^2 and leaves the filling slack between the eyes of the fork, the clamp $I J$ moves outward and takes up this slack.

It may be proper to state that instead of the fork l^2 there may be employed any two suitable bearing-surfaces, against and between which the filling may be supported while being carried forward by the action of the finger l to draw its loop into the selvage.

The clamp $I J$ performs another office besides that above mentioned, of holding the filling while being tightened in the right-hand selvage by the finger l —that is to say, by clamping the filling while the needle is completing its backward movement, it enables the needle to draw the filling tight into the left-hand selvage.

Figs. 2, 3, 4 of the drawings also show the hook N arranged near the fell, on the left side of the loom, to draw the filling into the nearly-vertical position, which is desirable to enable it to be caught by the needle. This hook forms no part of the present invention, but is well known as used in other needle-looms, and is only shown here to enable the relative position of the tightening-finger l to be better understood, the said finger being represented as arranged nearer to the outside of the loom than the said hook N and than the fixed eye n , through which the filling comes to the range of the said hook. The cam L^2 , carrying the wings l^5 , for operating the tightening-finger l , is represented as the same one employed for operating the said hook N , the operation being effected through a lever, N' , and a rod, n' .

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

1. The combination, in a loom, of a weft-carrying needle and mechanism for operating the same, a stationary shuttle-bearing, a stationary shuttle lying in said bearing, a weft-transferring finger arranged to work backward and forward parallel with the warp, and mechanism for operating the said finger to carry the loops of the weft over the said shuttle, substantially as herein described.

2. The combination, in a loom, with a weft-inserting needle and mechanism for operating the same, and a stationary shuttle for carrying a selvage-thread, of the forked weft-transferring finger f , the lever F , on which the said finger is formed or to which it is attached, the rod f^3 , the lever F'' , and the cam F' , the whole arranged and operating substantially as and for the purpose herein set forth.

3. The combination, in a loom in which the weft is inserted by a needle, of a stationary shuttle for supplying a selvage-thread for securing the weft, and a finger attached to and moving with the lay for the purpose of drawing the thread from said shuttle and evening the selvage, substantially as herein described.

4. The combination, in a loom, of a weft-carrying needle and mechanism for operating the same, a weft-clamp arranged on that side of the loom whence the weft is supplied, and capable of a movement in a direction cross-wise of the loom, and mechanism for producing

such movement of the said clamp and for opening and closing the same, substantially as and for the purpose herein specified.

5 The combination, in a loom, of a weft-carrying needle and mechanism for passing the same through the warp from one side of the loom, a weft-clamp arranged on the opposite side of the loom and capable of a movement crosswise thereof, and a rod extending across
10 the loom and connecting said clamp with the said needle or its operating mechanism, whereby the said clamp has its said movement produced by the same mechanism by which the said needle is operated, substantially as herein
15 described.

6. The combination, in a loom, of a weft-carrying needle and mechanism for operating the same, a weft-clamp arranged on that side of the loom whence the weft is supplied, mechanism for moving the said clamp in a direction crosswise of the loom, and a weft-tightening
20 finger arranged to operate on the weft between said clamp and the adjacent side of the warp, and mechanism for producing the operation of
25 said finger, substantially as herein described.

7. The weft-clamp consisting of the lever I, furnished with one clamping-jaw, a lever, J, pivoted to said lever I and furnished with the other clamping-jaw, and a spring applied to the said levers to open the said jaws, and a
30 stop, *i*⁴, to restrict the opening of the said jaws, in combination with mechanism connected with said jaw J, whereby the jaws are first closed and afterward caused to move together, substantially as herein described.

8. The combination, with the weft-carrying needle and its operating mechanism, of the weft-clamp composed of the two levers I J, pivoted together and furnished with jaws *i j*, a
35 spring for opening said jaws, and a stop, *i*⁴, to
40 restrict the opening thereof, and a connection between the lever J and the needle-operating mechanism, whereby the jaws are first closed and then caused to move with the needle, substantially as herein described.

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