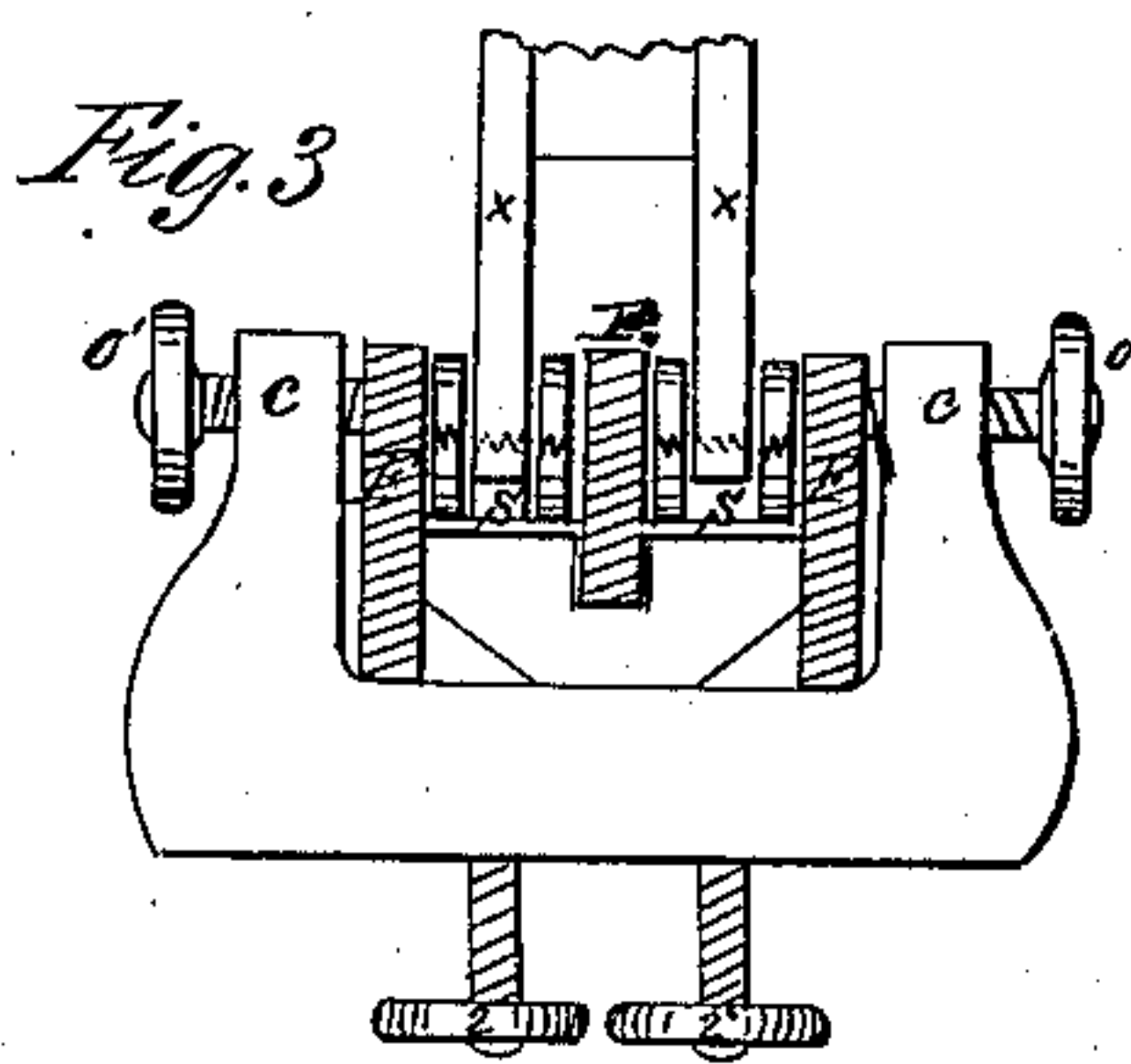
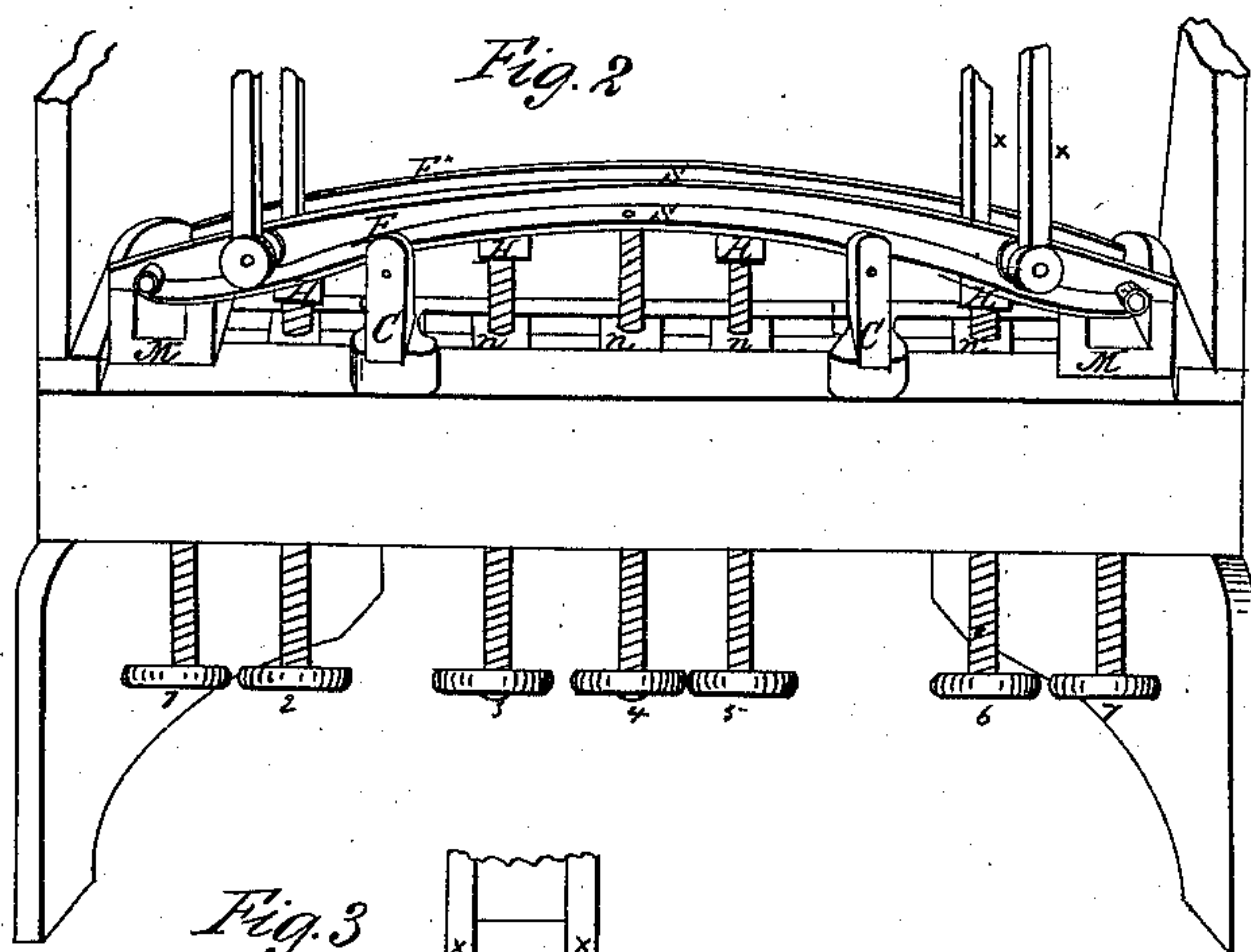
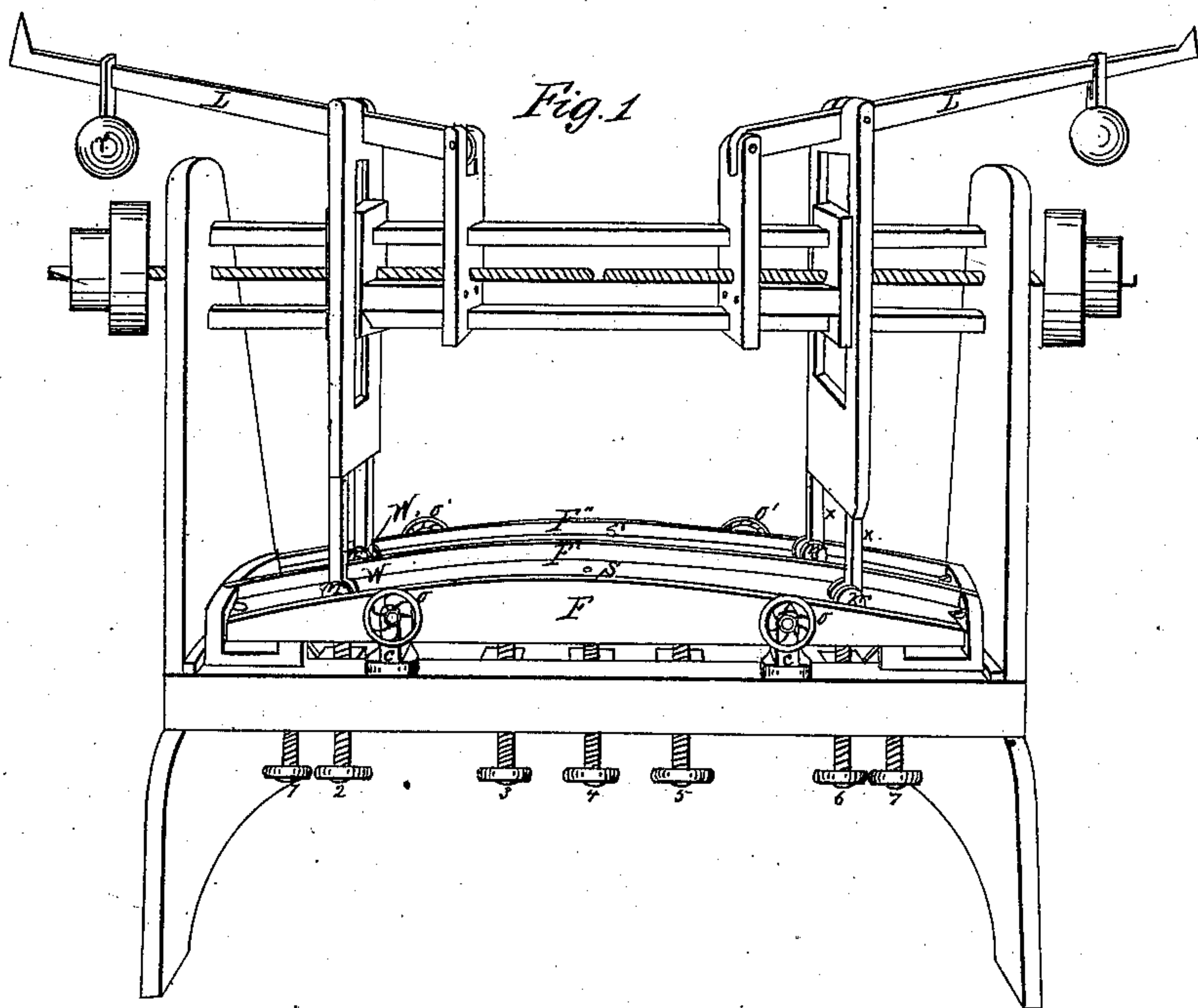


Cleveland & Guildersleve,
Making Carriage Springs,
No 104, 114, *Patented June 14, 1870.*



Witnesses;
J. P. McLean
Thos Gray

Inventors
James B. Cleveland
Henry B. Guildersleve

UNITED STATES PATENT OFFICE.

JAMES B. CLEVELAND AND HENRY C. GUILDERSLEIVE, OF NEWARK, N. J.

IMPROVED MACHINE FOR FORMING ELLIPTIC SPRINGS.

Specification forming part of Letters Patent No. 104,114, dated June 14, 1870.

To all whom it may concern:

Be it known that we, JAMES B. CLEVELAND and HENRY C. GUILDERSLEIVE, of the city of Newark, in the county of Essex and State of New Jersey, have invented new and useful improvements in machinery for forming or setting up spring-plates into any desired curvature to suit the different kinds of springs for carriages; and we hereby declare the nature of our said invention, and in what manner the same is to be performed, as particularly described and set forth in and by the following statement, reference being had to the accompanying drawing, which is lettered to correspond with and form a part of the specification.

Figure 1 is a perspective front view of our machine. Fig. 2 is a perspective front elevation of the same, having all the top part and front spring-clamping bar or movable flange F removed, in order to show the arrangement of the spring-plates S S', vertical screw-jacks or spiral-grooved upright bars 1 2 3 4 5 6 7, with head-pieces H H H H H, pressure-bars and wheels W W', horizontally-adjustable screw-nuts *n n n n*, and adjustable end pieces, M M', to hold the different lengths of plates S S' during the process of raising the same to any suitable curve. Fig. 3 is a vertical transverse section of our machine, showing the chairs or bed-pieces C C, which support the spring-plates S S', of any required width, and which are held in their places by the plates F F' F'' by means of the set-screws *o o'*.

This drawing also shows two sets of pressure-wheels, which fit into any curve of the spring-plates when operated by the action of the vertical pressure-bars *x x x x*, to which the wheels W W' are attached.

In order to form or set up two sets of spring-plates at a time by our machine, we first raise up the levers L L', which cause the vertical pressure-bars *x x* to raise the pressure-wheels W W' W' W', Fig. 2, so as to allow the red-hot plates S S' to be laid upon the chairs or beds C C between the clamping-bars F F' F'', which are pressed up tight against the steel spring-plates by the set-screws *o o o' o'*, after securing the ends of the plates by the adjustable end blocks, M M', Figs. 1 and 2. The levers L L' are then loaded with any suitable

weights *r r*, to produce a downward pressure upon the plates S S', after which the elevating-screws 1 2 3 4 5 6 7 are turned up against the under side of spring-plates S S', to force the same upward, in order to obtain the required curve at the center of the plates or lifts, or at the ends thereof, as shown in the drawing.

We employ four sets of pressure-wheels, W W' W' W', for the purpose of producing a more uniform downward pressure at any of the different points of curvature that may be required in the different-shaped carriage-springs.

Our machine is so constructed that all its parts are adapted to setting up or fitting any of the different lengths or widths of spring-plates requiring any of the different curves by the application of adjustable screw-jacks 1 2 3 4 5 6 7, and adjustable parallel bars *x x*, and loaded levers L L', to produce the opposite pressures at the same time upon two sets of springs simultaneously by one and the same operation.

We do not confine ourselves to any specific manner of horizontally adjusting the upper pressure-bars, *x x x' x'*, as pulleys, or a right and left handed screw-bar, or two right-handed screws may be employed, if preferred.

We are aware that parallel upright bars and rollers are in common use for setting or fitting spring-plates; hence these do not constitute our invention; but the nature of our invention is the construction of a machine that will set up or form into any of the required curves two sets or parts of sets of elliptic spring-plates for carriages simultaneously, by means of horizontally-adjustable screw-jacks or spiral-grooved upright shafts 1 2 3 4 and parallel drop-bars *x x x' x'*, which are also horizontally adjusted from point to point, for the purpose of operating upon the spring-plates at said fixed points, and not to travel over the same during the operation of pressing.

The pressure-bars *x x x' x'* are provided with loaded levers L L', to produce the opposite or downward pressure, together with the adjustable end blocks, M M', four sets of pressure-wheels, W W' W' W', and three clamping-bars or detached flanges, F F' F'', all secured, arranged, and operated as shown in the drawing; therefore,

What we claim as our improvement, and desire to secure by Letters Patent of the United States, is—

The combination of the adjustable screw-jacks 1 2 3 4 5 6 7, adjustable pressure-bars x x' x'' , levers L L', wheels W W, end blocks, M M', adjustable nuts n n , head-pieces H H, clamping-bars F F' F'', and set-screws o o , all constructed, arranged, and operating in the manner and for the purpose specified.

In testimony whereof we hereunto subscribe our names in the presence of two witnesses.

JAMES B. CLEVELAND.
HENRY C. GUILDERSLEIVE.

Witnesses:

JAMES P. McLEAN,
EDWARD W. HOTCHKISS.