(No Model.) 5 Sheets—Sheet 1.

S. S. RAYMOND, S. N. BOURNE & W. W. CAREY.

GAGE AND FEED ATTACHMENT FOR BUZZ PLANING MACHINES.

No. 388,584. Patented Aug. 28, 1888.

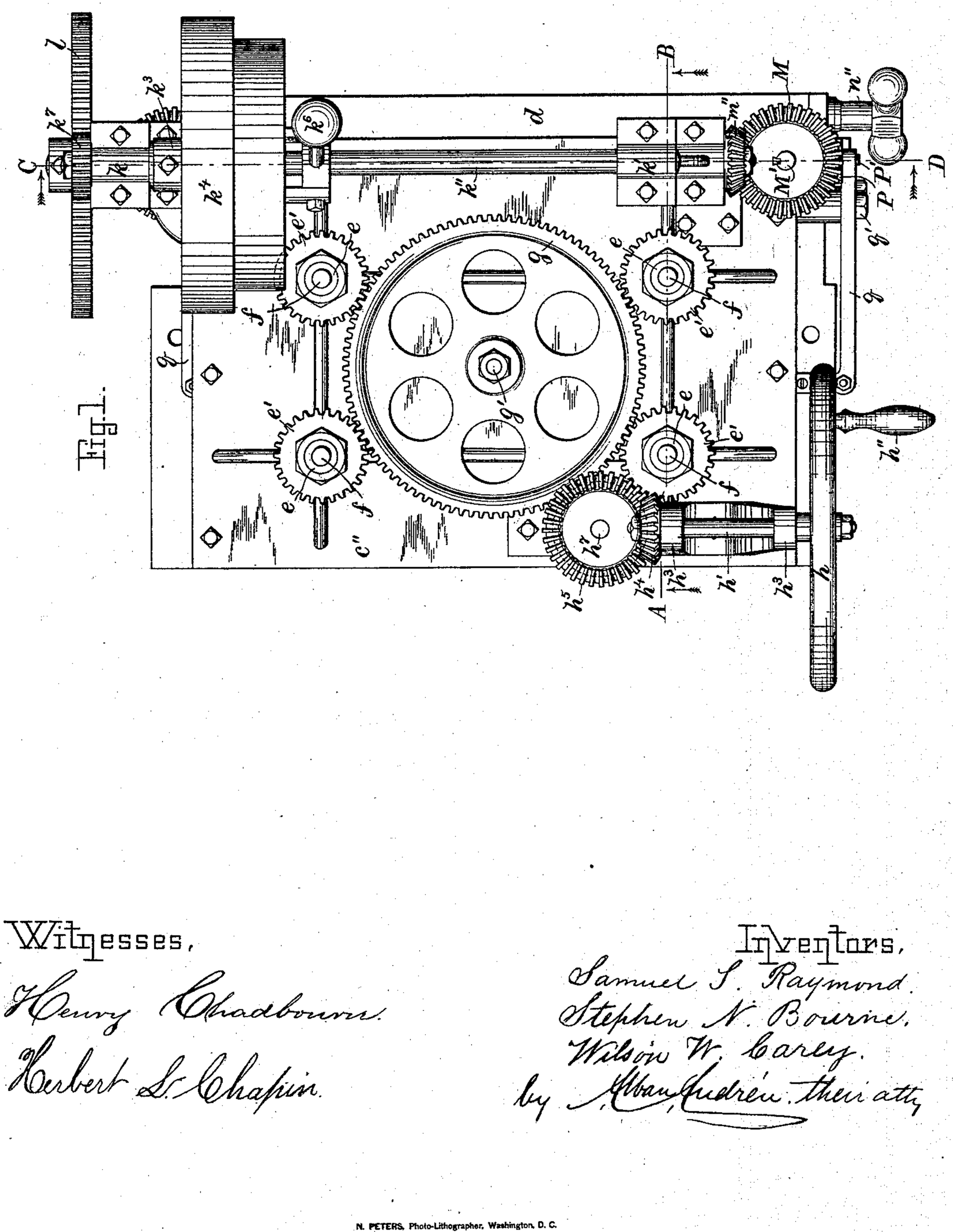

Fig. 1.

Witnesses,

Henry Chadbourn.

Herbert L. Chapin.

Inventors,

Samuel S. Raymond.

Stephen N. Bourne.

Wilson W. Carey.

by Albert Andrews their atty

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets—Sheet 2.

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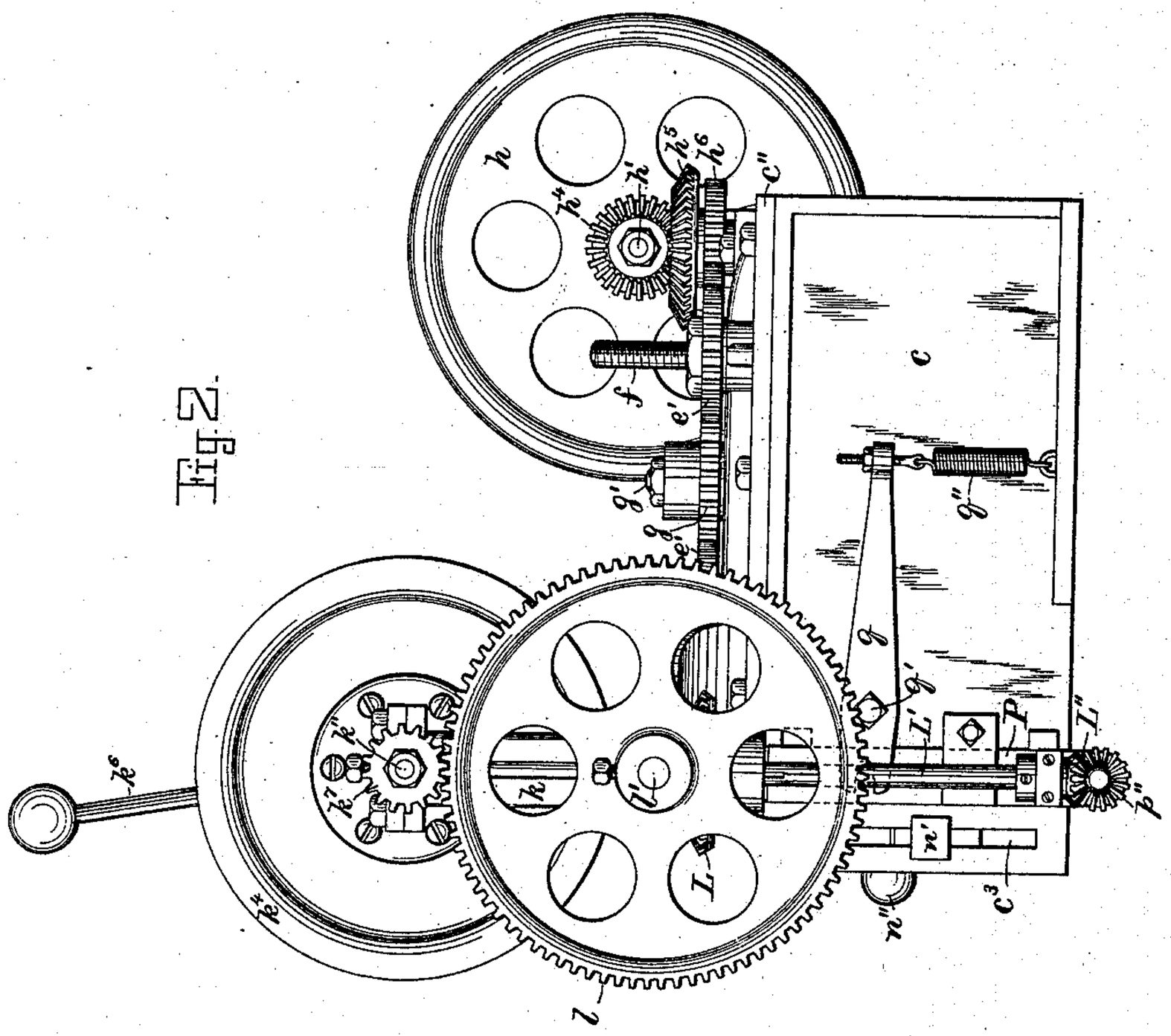
Fig. 2.



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N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets--Sheet 3.

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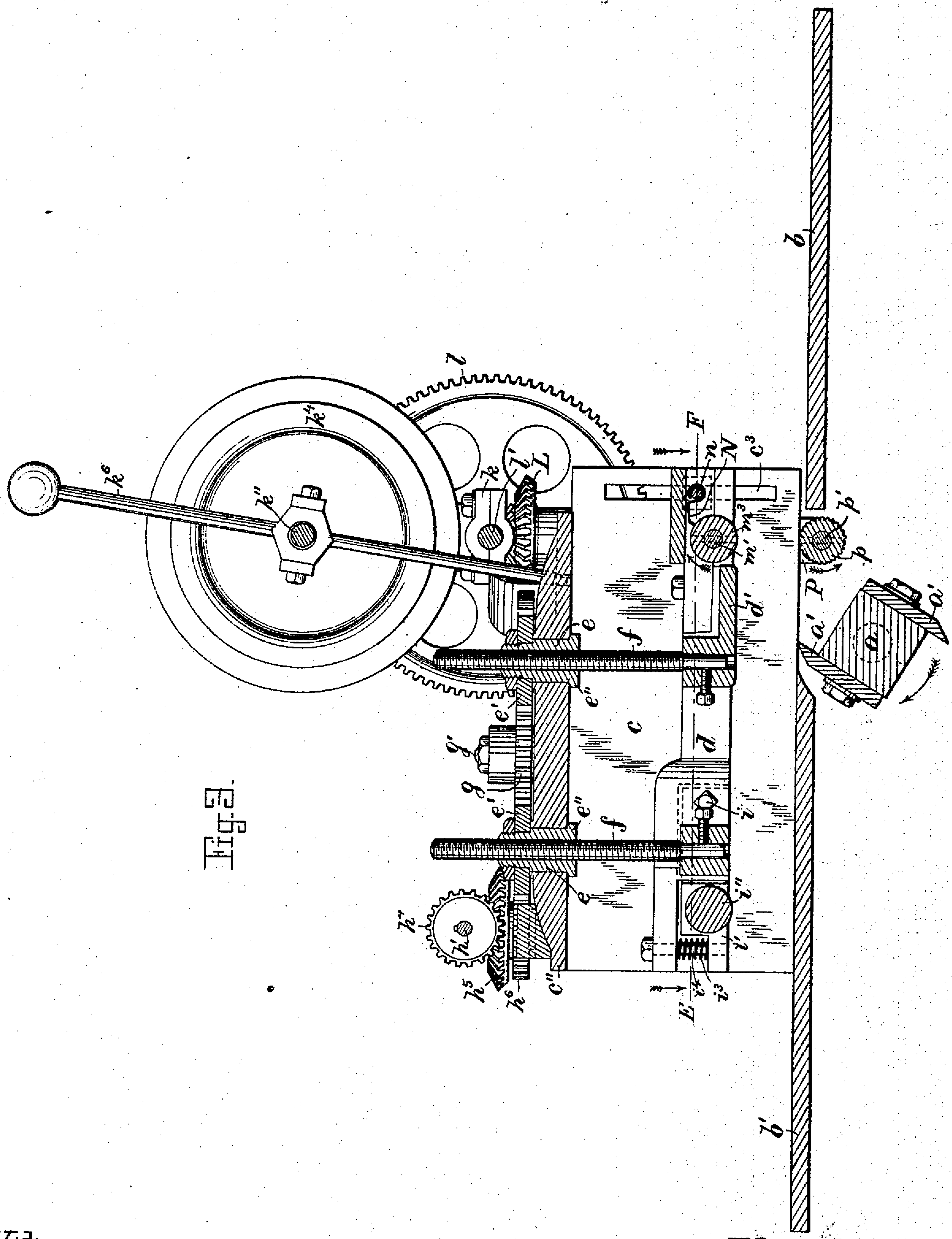

Fig. 3.

Witnesses,
Henry Chadbourn.
Herbert L. Chapin.

Inventors.
Samuel S. Raymond.
Stephen N. Bourne.
Wilson W. Carey
by Alban Andrén their atty

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets—Sheet 4.

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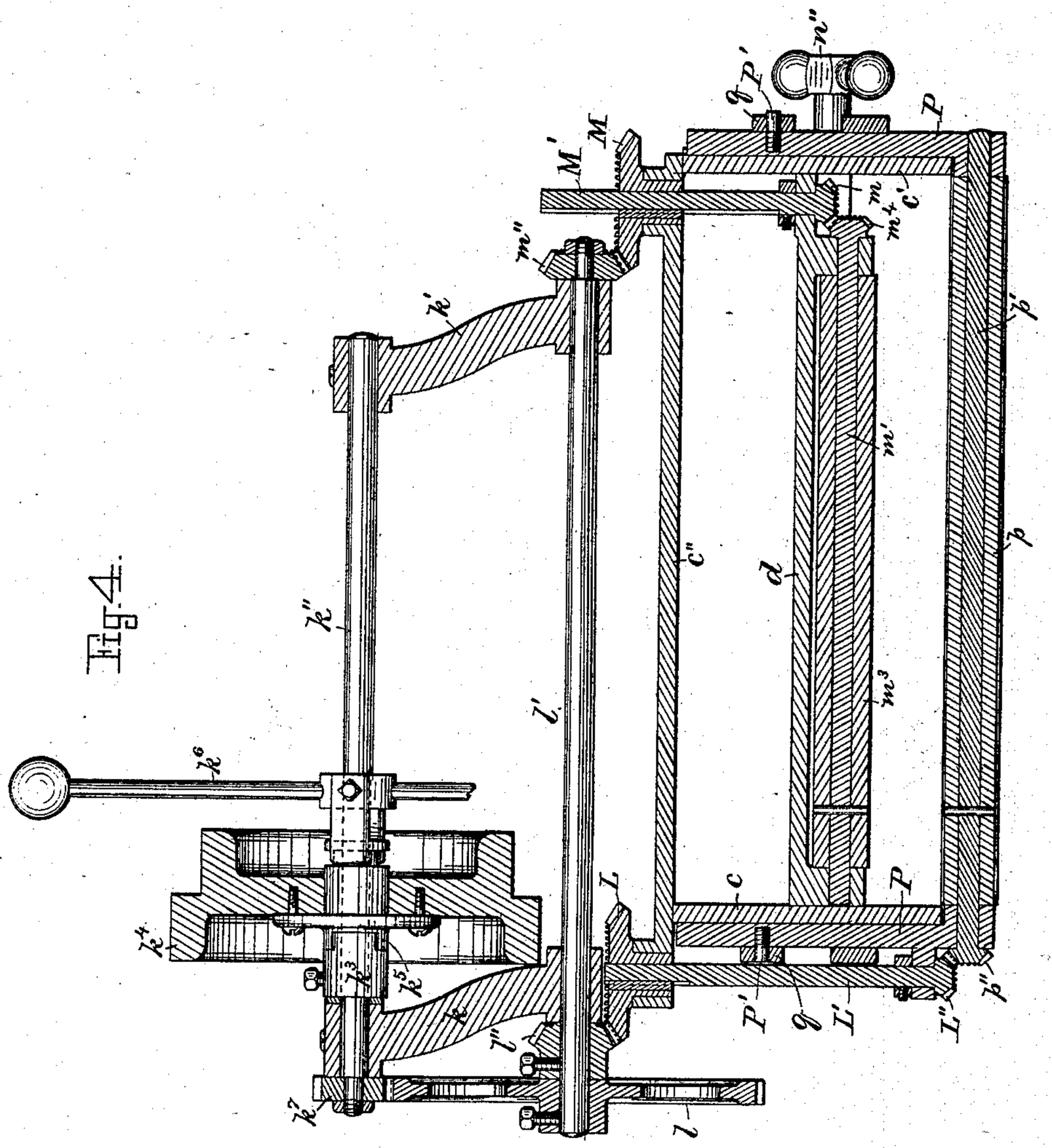
Fig. 4.



Witnesses.

Henry Chadbourne.

Herbert L. Chapin.

Inventors,

Samuel S. Raymond.
Stephen N. Bourne.
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N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets—Sheet 5.

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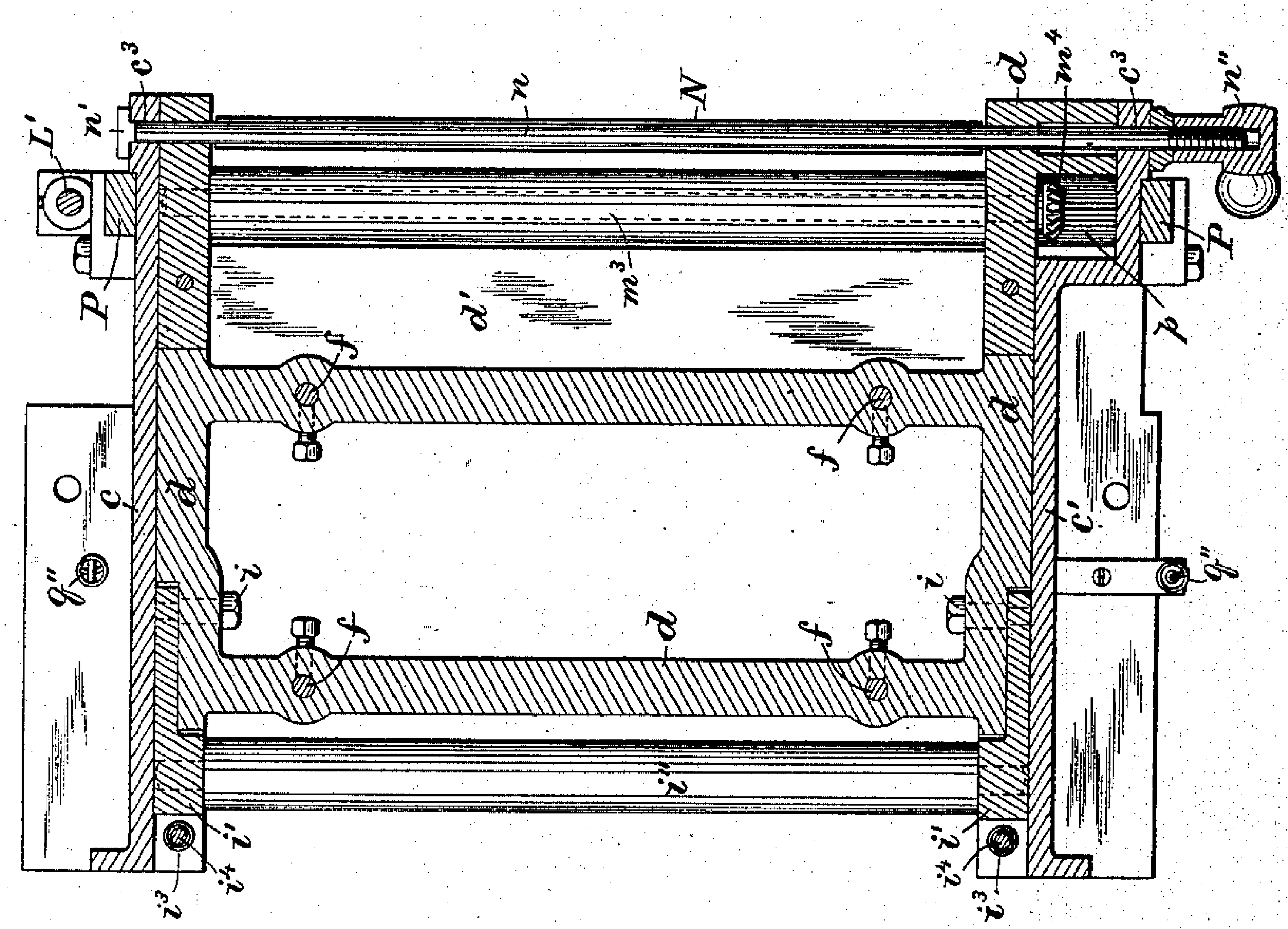
Fig. 5.



Witnesses,

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Inventors

Samuel S. Raymond.

Stephen N. Bourne.

Wilson W. Carey

by Alban Andrén their

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL S. RAYMOND AND STEPHEN N. BOURNE, OF MANCHESTER, NEW HAMPSHIRE, AND WILSON W. CAREY, OF LOWELL, MASSACHUSETTS.

GAGE AND FEED ATTACHMENT FOR BUZZ PLANING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 388,584, dated August 28, 1888.

Application filed April 19, 1888. Serial No. 271,145. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL S. RAYMOND and STEPHEN N. BOURNE, citizens of the United States, and residents of Manchester, in the county of Hillsborough and State of New Hampshire, and WILSON W. CAREY, a citizen of the United States, and a resident of Lowell, in the county of Middlesex and State of Massachusetts, have jointly invented new and useful Improvements in Gage and Feed Attachments for Buzz Planing-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in feed attachments for buzz planing-machines, and it is constructed as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a plan view of the invention. Fig. 2 represents an end view seen from C in Fig. 1. Fig. 3 represents a cross-section on the line A B shown in Fig. 1. Fig. 4 represents a cross-section on the line C D shown in Fig. 1, and Fig. 5 represents a horizontal section on the line E F shown in Fig. 3.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In Fig. 3, *a* represents the rotary shaft of an ordinary buzz planer, said shaft having secured to it the knives *a' a'* in the usual manner. *b* and *b'* represent the movable table-tops or work-supports of the buzz planer, as usual.

In connection with the buzz planing-machine we use our improved feed attachment for the purpose of feeding the stock that is to be planed and to plane it to any desired thickness, as will hereinafter be more fully shown and described.

To the table-top *b'* are secured in any suitable manner the upright side frames, *c* and *c'*, to the upper ends of which is secured the plate or cover *c''*, as shown. Between the upright side pieces, *c c'*, is vertically adjustable the gage *d*, having on its under side, directly above the cutter-shaft *a*, the gage projection or surface *d'*, between which and the top of the table part *b'* the stock is fed after being planed on its under side by the rotary cutters *a' a'*. The gage *d* is vertically adjustable, to compensate for the desired thickness of the planed stock, by the following mechanism.

In perforations in the plate *c''* are journaled the vertical sleeves or bushings *e e e e*, each of which has secured to its upper end a spur gear-pinion, *e'*. (Shown in Figs. 1, 2, and 3.) The bushings *e e* have each a central vertical screw-threaded perforation adapted to receive a screw-threaded vertical shaft or spindle, *f*, the lower end of which is secured firmly in a suitable manner to the gage-plate *d*, as shown in Fig. 3. The bushings *e e* are free to turn in their bearings in the plate *c''*, but are prevented from moving up and down therein, the pinion *e'* in the upper end and collar *e''* in the lower end serving as stops to prevent a vertical movement of each of said bushings *e*, as shown in Fig. 3. All of the said pinions *e' e' e' e'* have their teeth meshing in the intermediate gear-wheel, *g*, that is loosely journaled on the spindle *g'*, secured to the top of the plate *c''*, as shown in Fig. 1.

The gear *g* and its pinions *e' e' e' e'* may be simultaneously operated by any suitable device. In practice we prefer to use a crank-wheel, *h*, secured to the outer end of the horizontal shaft *h'*, and provided with a crank or handle, *h''*, as shown in Figs. 1 and 2. The shaft *h'* is journaled in suitable bearings, h^3 h^3, secured to the plate *c''*, and has secured to its inner end the bevel-gear h^4, meshing in the teeth of the bevel-gear h^5, to the under side of which is secured the pinion h^6, that meshes in the teeth of the gear *g*. The gears h^5 and h^6 are loosely journaled on the vertical pin or stud h^7, secured to the plate *c''*, as shown in Fig. 1. It will thus be seen that by turning the hand-wheel *h* the bushings *e e* are simultaneously rotated, causing the screw-threaded spindles *f f* and gage *d d'*, with its rollers, hereinafter to be described, to rise or descend, according to the direction in which said hand-wheel is rotated and according to the thickness of the board that is being planed.

To the rear end of the gage-plate *d* are pivoted at *i i* the bearings *i' i'*, in which is loosely journaled the anti-friction roller *i''*. (Shown in Figs. 3 and 5.) Each of the bearings *i'* is made vertically yielding against the influence of a spring, i^3, that surrounds the bolt i^4, which

latter passes loosely through the rear end of the gage *d*, and is screwed into the rear end of the bearing *i'*, as shown in Figs. 3 and 5. By this arrangement the loosely-journaled roller *i''* is automatically held with a proper pressure against the top of the board as it is fed onward during the operation of planing it.

In connection with the above described adjustable gage device we use a positive feed-roller device which is constructed and arranged as follows:

In standards *k k'*, secured to the top of the plate *c''*, is journaled the driving-shaft *k''*, to which is secured the clutch *k³*. (Shown in Figs. 1, 2, 3, and 4.) On the driving-shaft *k''* is loosely journaled the driving-pulley *k⁴*, provided with a tooth-clutch, *k⁵*, adapted to engage with the clutch *k³* when the pulley *k⁴* is moved by the shipper-lever *k⁶* to the position shown in the drawings, in the usual manner of starting and stopping driving-pulley devices. The pulley *k⁴* is set in a rotary motion by belt-power, as usual. To the shaft *k''* is secured the pinion *k⁷*, the teeth of which mesh in the teeth of the spur-gear *l*, that is secured to the shaft *l'*, journaled in bearings in the standards *k k'*, as shown in Fig. 4. To said shaft *l'* is also secured the bevel gear-pinions *l''* and *m''*, the teeth of which mesh, respectively, in the teeth of the bevel-gears L and M, that are journaled in bearings in the top plate, *c''*, as shown in Fig. 4.

M' is a vertical shaft that passes through the hub of the bevel-gear M, and is splined to the same to permit said shaft to be vertically movable relative to the gear M, for the purpose as will hereinafter be described. The lower end of the shaft M' is journaled in the vertically-adjustable gage-plate *d*, or a plate attached to it, and to the lower end of said shaft is secured the bevel gear-pinion *m*, the teeth of which mesh in the teeth of the pinion *m⁴*, that is secured to the horizontal shaft *m'*, journaled in bearings in the gage-plate *d*, and having secured to it the upper feed-roller, *m³*, as shown in Figs. 3, 4, and 5, and by this arrangement a positive rotary motion is imparted to the said feed-roller *m³* from the driving-shaft *k''*. The bevel-gear M being splined on the shaft M', it will be seen that the gage *d* and its feed-roller *m³* may be adjusted up and down, according to the thickness of the boards that are being planed, without disconnecting the bevel-gears *m''* M, which latter are always kept in gear, as shown and described. After the gage-plate *d* has been adjusted to the desired position above the table *b'*, it is firmly secured to and between the upright side pieces, *c* and *c'*, by means of the clamping-bolt *n*, that passes through vertical slots *c³ c³* in the side pieces, *c c'*, and perforations in the gage-plate *d*, said clamping-bolt *n* having a head, *n'*, in one end, and is provided with a screw-threaded nut or handle, *n''*, in its opposite end, that is screwed around the outwardly-projecting screw-threaded end of the clamping-bolt *n*, as shown in Fig. 5.

On the bolt *n* is preferably arranged the sheet-metal scraper N, the free end of which lies in contact with the feed-roller *m³*, and serves for the purpose of scraping and removing accumulations from said feed-roller, so as to keep it clean during the operation of the machine. The under side of the feed-roller *m³* is arranged even or on a line with the under side of the gage projection or surface *d'*, as shown in Fig. 3.

In front of the cutter-shaft *a*, and directly below the feed-roller *m³*, is located the corrugated feed-roller *p*, that is secured to or made in one piece with the shaft *p'*, as shown in Fig. 4. The ends of the shaft *p'* are journaled in vertically-yielding bars P P, guided in ways on the outside of the stationary frames *c c'*, as shown in Figs. 3, 4, and 5. The feed-roller *p* is automatically held upward with a yielding pressure by means of levers *q q*, pivoted at *q' q'* to the frames *c c'*, said levers being forked at one end and there connected to pins or studs P' P', secured to the vertically-yielding bars P P, as shown in Figs. 2 and 4, while the other ends of said levers are connected to the lower portions of the frames *c c'* by means of springs *q'' q''*, as shown in Figs. 2 and 5, by which arrangement the feed-roller *p* is free to yield downward, while the board to be planed is moved forward on the table *b* and introduced between the feed-rollers *m³* and *p*. The feed-roller *p* is automatically rotated with a speed equal to that of the upper feed-roller, *m³*, by the following mechanism, viz:

On the rotary shaft *l'* is secured the bevel gear-pinion *l''*, meshing in the teeth of the bevel-gear I, the hub of which is journaled in a bearing in the top plate, *c''*, as heretofore described, and as shown in Fig. 4. The bevel-gear L is splined to the shaft L', the lower end of which has a bearing in one of the vertically-yielding bars P, as shown in Figs. 2 and 4, and said shaft L' has secured to its lower end the bevel-pinion L'', the teeth of which mesh in the teeth of the bevel gear-pinion *p''*, secured to one end of the lower feed-roller shaft, *p'*, as shown in Figs. 2 and 4.

The operation of the device is as follows: The frame *c c' c''* is secured to the top of the rear table, *b'*, of the buzz planer, as described. The gage *d* and its gage projection or surface *d'* is then adjusted to the desired position, according to the thickness of the stock to be planed, and after being so adjusted it is firmly secured in position by the mechanism described. The feed attachment is then set in operation by applying rotary motion to the driving-pulley *k⁴*, causing the feed-rollers *m³ p* to rotate in the directions shown by arrows in Fig. 3. The cutter-shaft *a* and its blades or cutters *a' a'* are then set in a quick rotary motion, as usual. The stock to be planed is then laid on the front lower table, *b*, and its end pushed between the feed-roller *m³* and vertically-yielding feed-roller *p*, causing the latter to yield downward against the influence of its springs sufficiently to allow the stock to move

onward. As soon as the stock is introduced between said feed-rollers it is automatically fed forward and acted on by the rotary cutters a' a', and after being planed the board is made to pass onward between the rear table, b', and the gage-surface d' and the yielding anti-frictional roller i'', thus causing the board to be planed to the thickness desired. When so desired, the attachment may easily be removed from the buzz planer, and the latter may then be used in the ordinary manner. By this arrangement an ordinar buzz planer may instantly be converted into a planing-machine for planing to a desired thickness with an automatic feed.

Having thus fully described the nature, construction, and operation of our invention, we wish to secure by Letters Patent, and claim—

1. The frame c c' c'', having journaled in its top portion the internally-screw-threaded bushings e e, provided with pinions e' e', combined with the vertically-adjustable gage d d', the screw-shafts f f, secured to said gage and screwed through the bushings e e, and means for operating said pinions and screw-shafts, as and for the purpose set forth.

2. The frame c c' c'', having the bushings e e journaled in its top portion and provided with connected pinions e' e', as described, combined with the set-screws f f, and the vertically-adjustable gage d d' and its positively-actuated feed-roller m^3, as and for the purpose set forth.

3. The frame c c' c'' and the vertically-adjustable gage d d', in combination with the positively-operated feed-roller m^3, journaled in said gage, and the scraper N, pivoted to said gage and having its free end bearing on the said feed-roller, as and for the purpose set forth.

4. The frame c c' c'' and the gage d d', vertically adjustable relative to said frame, combined with the positively-operated feed-roller m^3, journaled in the said gage, the rotary cutter-shaft a, and the positively-operated and vertically-yielding lower feed-roller, p, arranged below the feed-roller m^3 and in front of the rotary cutter-shaft a, as and for the purpose set forth.

5. In combination with the rotary buzz planer-knives a' a' and the table-tops b b', the detachable frame c c' c'', having vertically-adjustable gage d d', arranged as described, and the spring-pressed anti-friction roller i'', and positively-operated feed-roller m^3, journaled in said gage, and the vertically-yielding and positively-operated feed-roller p, arranged below the roller m^3 and in front of the buzz planer-tool, substantially as and for the purpose set forth.

6. The frame c c' c'' and the vertically-adjustable gage d d', having the positively-operated feed-roller m^3, in combination with the vertically-yielding and positively-operated lower feed-roller, p, and mechanism for imparting a rotary motion to it, consisting of the rotary shaft l', having pinion l'' secured to it, the gear L, journaled in the frame portion c'', and the shaft L', splined to said gear and having secured to its lower end the pinion L'', meshing in the pinion p'' on the lower roller, p, substantially as and for the purpose set forth.

7. The frame c c' c'' and the vertically-adjustable gage d d', having screw-threaded spindles f f f f, adapted to work in screw-threaded hubs on the pinions e' e' e' e', in combination with mechanism for operating said gage and its pinions, consisting of the crank or handle h'' and shaft h', secured to it, the pinion h^4, secured to said shaft and meshing in the loose gear h^5, and the pinion h^6, secured to gear h^5 and meshing in the gear g, that meshes in the teeth of the respective pinions e' e' e' e', substantially as and for the purpose set forth.

8. The frame c c' c'' and the vertically-adjustable gage d d', having the positively-operated upper feed-roller, m^3, journaled in it, as described, in combination with the vertically-yielding and positively-operated lower feed-roller, p, journaled in the vertically-movable bars or bearings P P, as described, and the levers q q, connected to said bearings and having their ends connected to the frame of the device by means of the springs q'' q'', substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 14th day of April A. D. 1888.

SAMUEL S. RAYMOND.
STEPHEN N. BOURNE.
WILSON W. CAREY.

Witnesses:
ALBAN ANDRÉN,
HENRY CHADBOURN.