

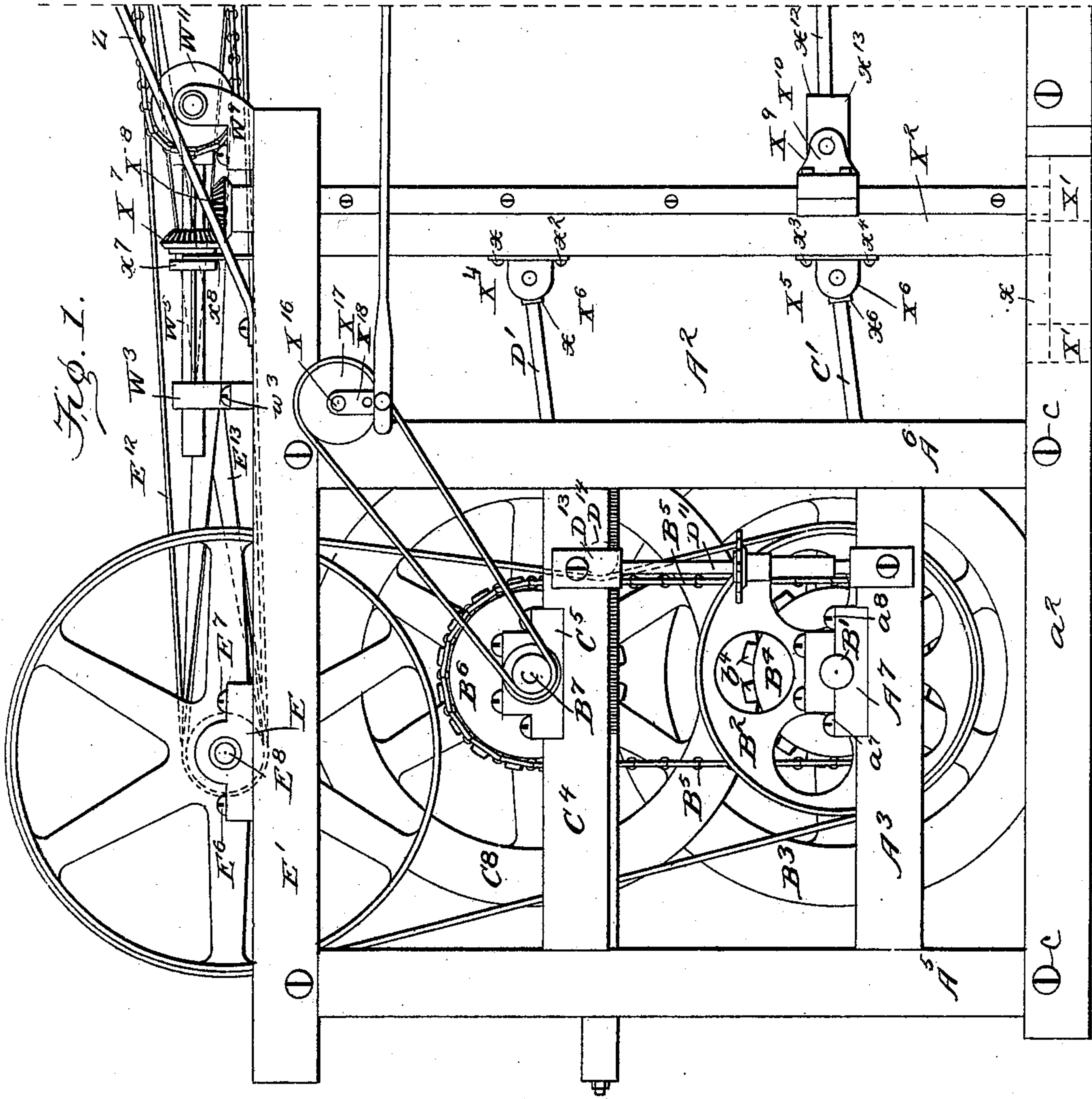
(No Model.)

6 Sheets—Sheet 1.

H. H. CUMMINGS.
STONE SAWING MACHINE.

No. 601,789.

Patented Apr. 5, 1898.



WITNESSES:

Robert H. O'Connell
E. M. McLaughlin

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Harry Harrison Cummings

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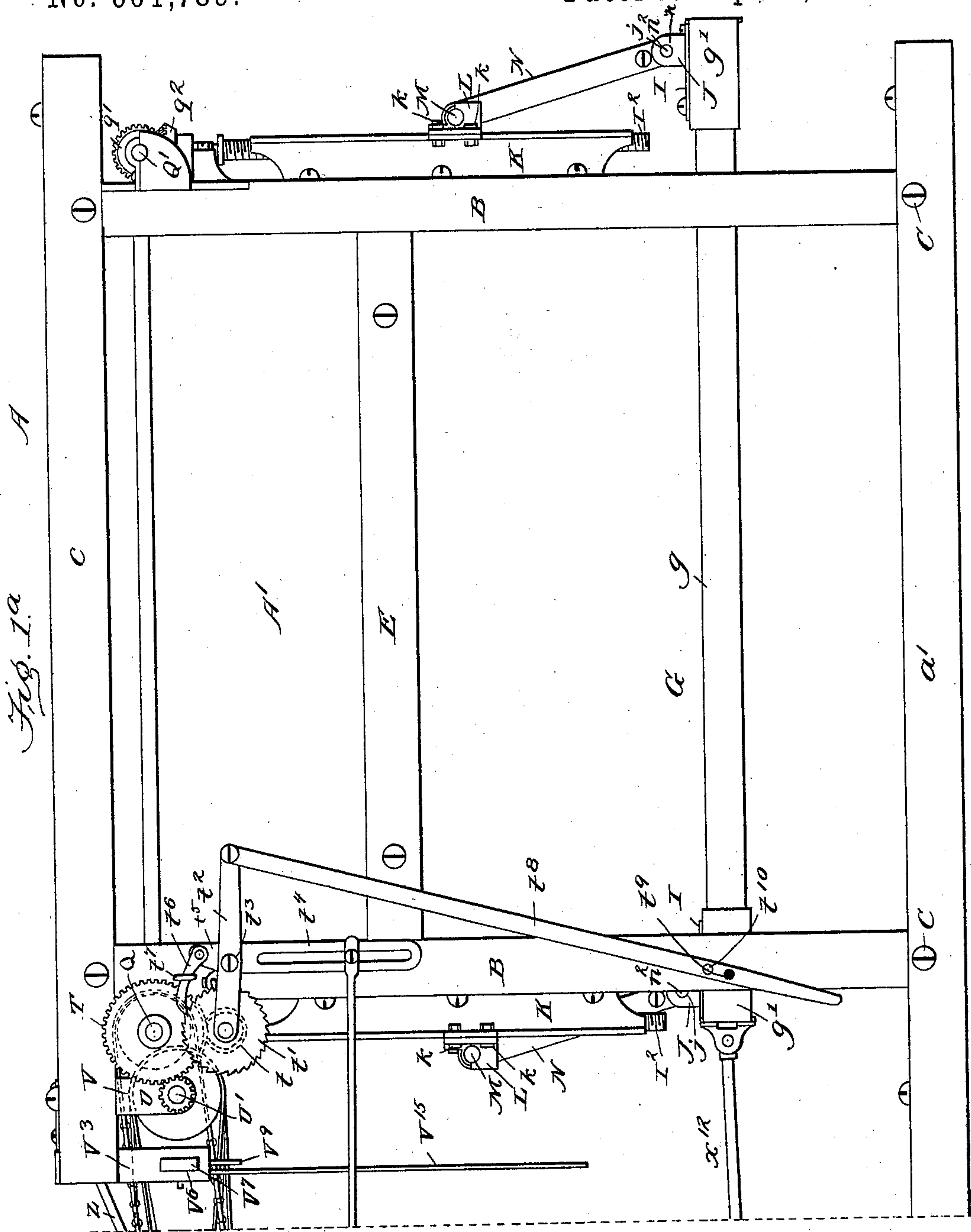
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6 Sheets—Sheet 2.

H. H. CUMMINGS.
STONE SAWING MACHINE.

No. 601,789.

Patented Apr. 5, 1898.



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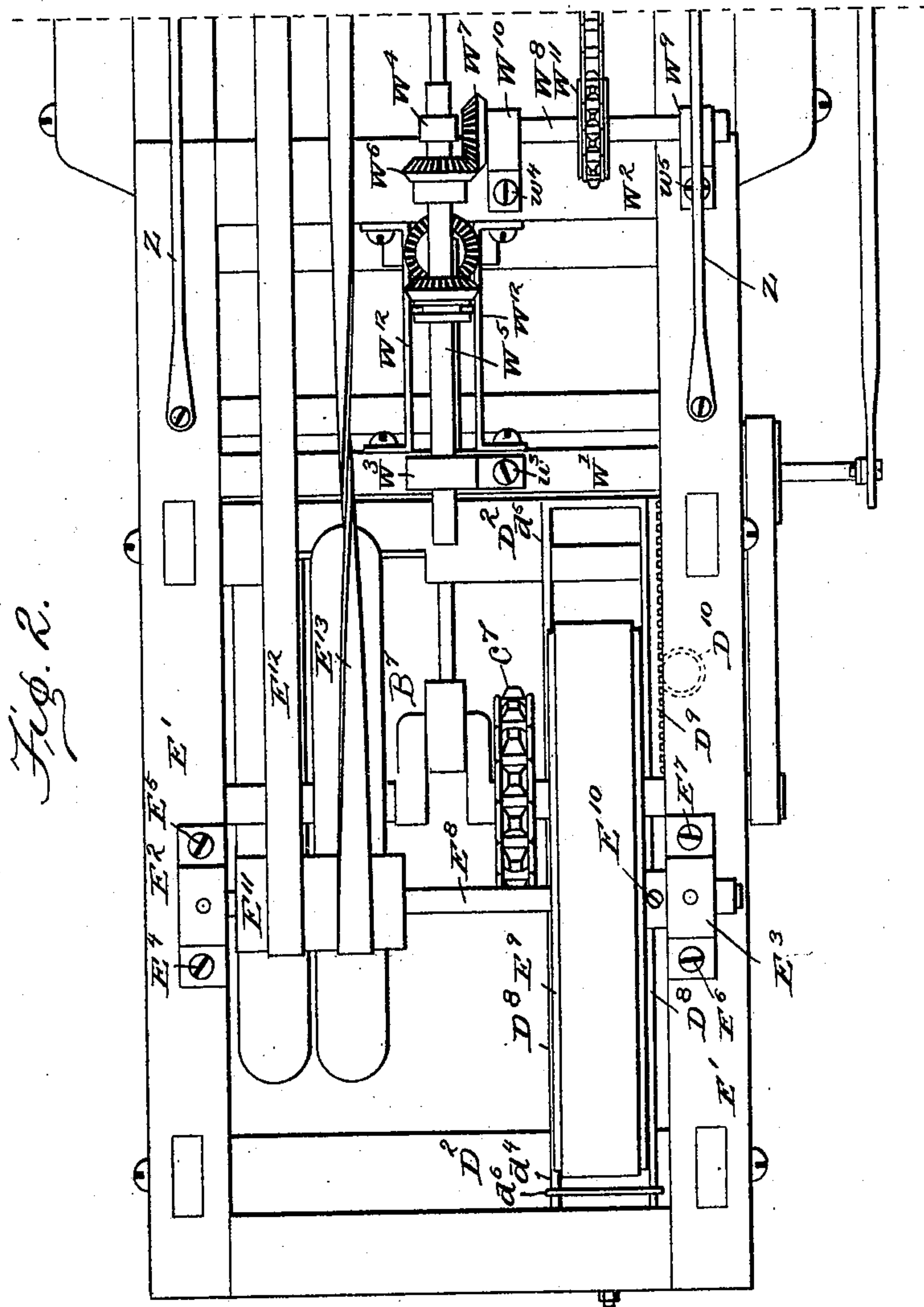
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6 Sheets—Sheet 3.

H. H. CUMMINGS.
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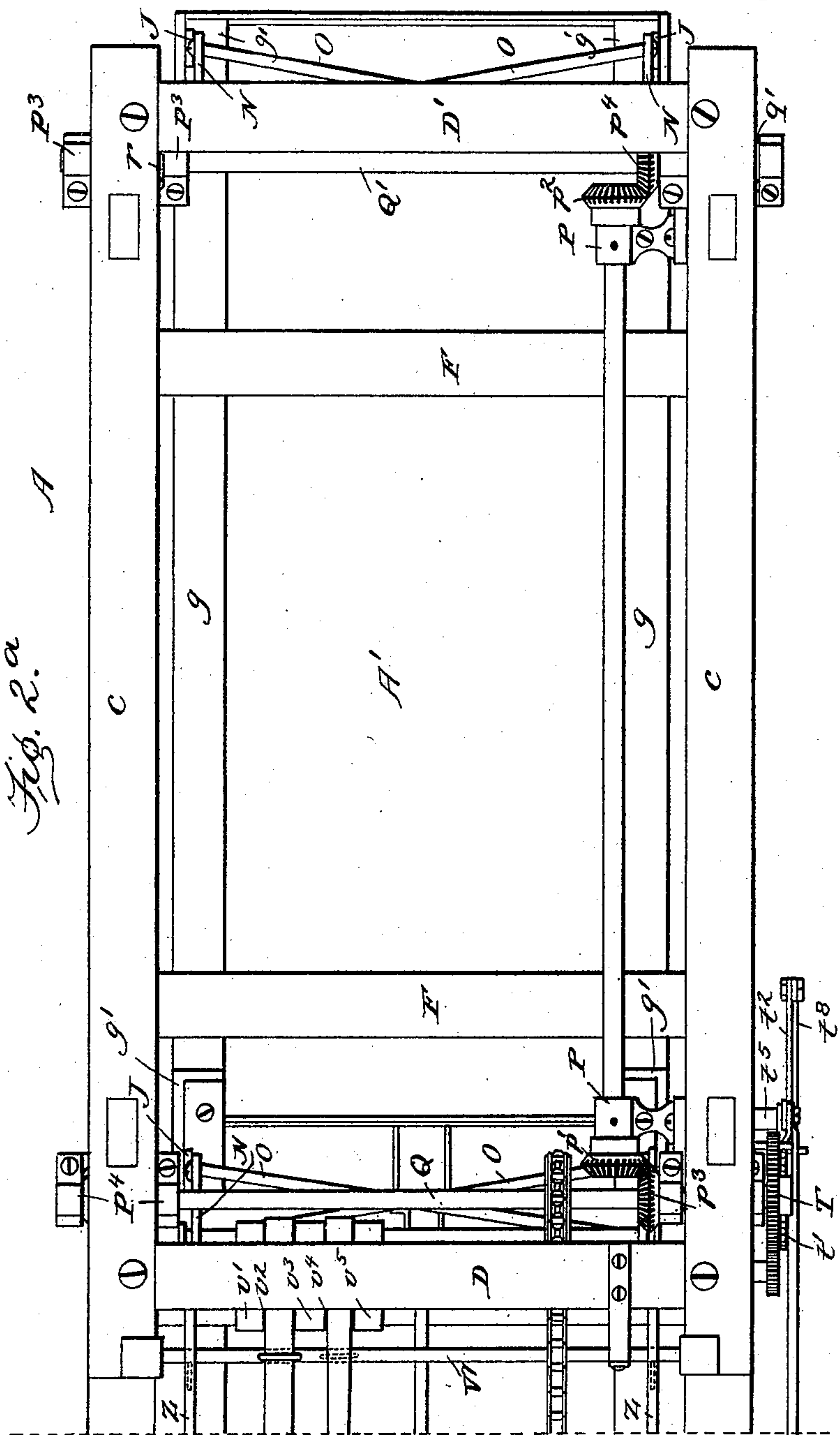
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6 Sheets—Sheet 4.

H. H. CUMMINGS.
STONE SAWING MACHINE.

No. 601,789.

Patented Apr. 5, 1898.



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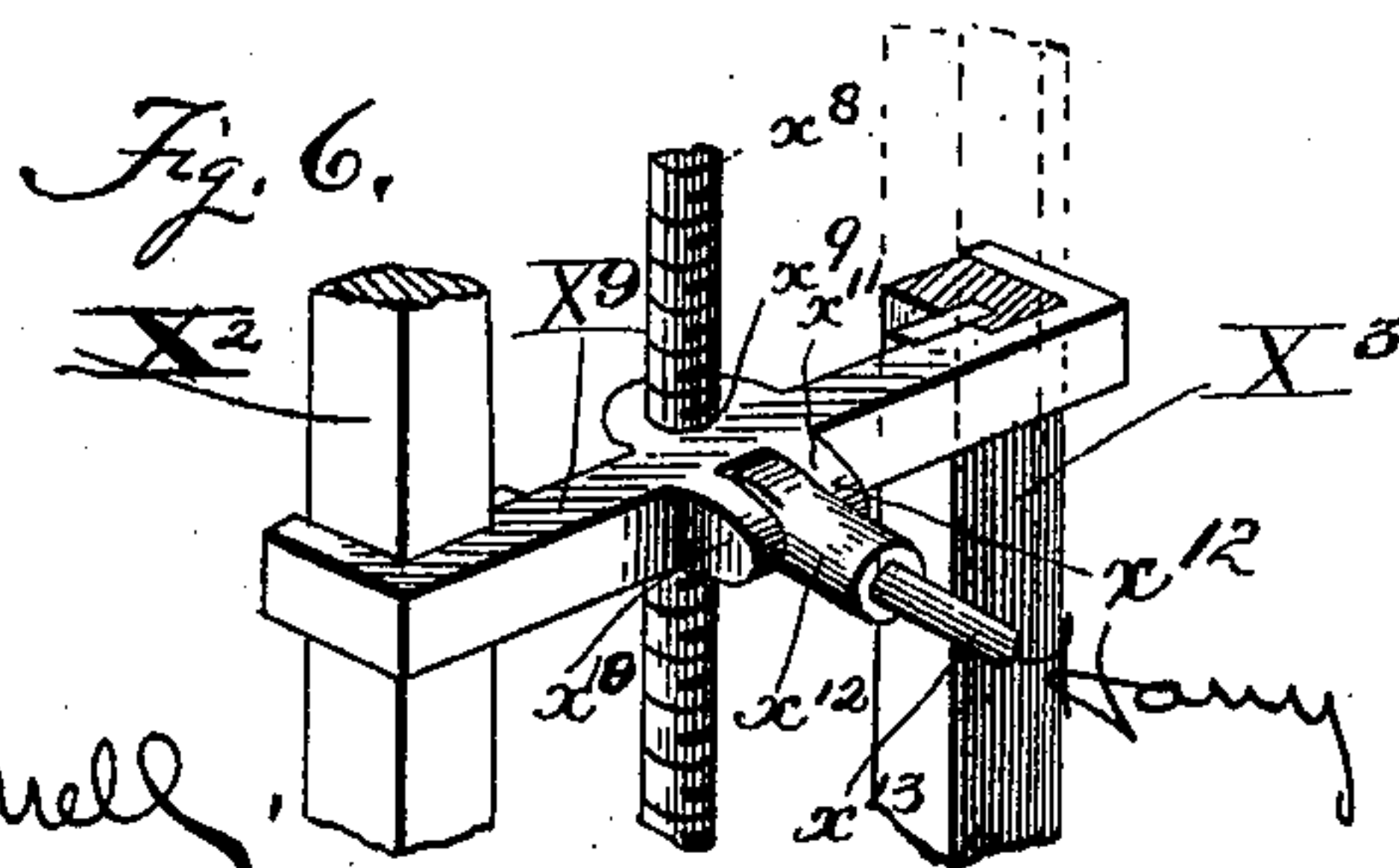
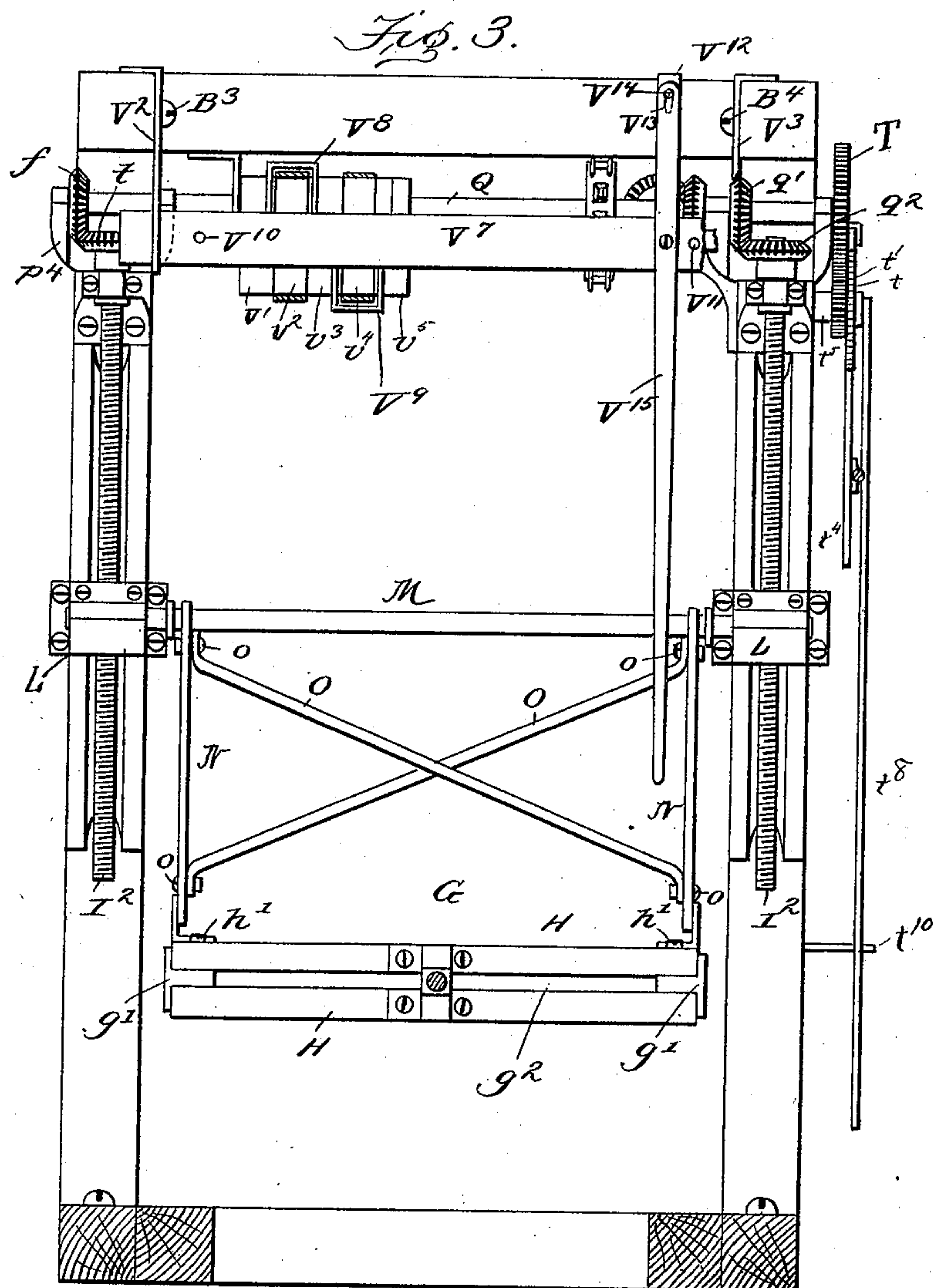
(No Model.)

6 Sheets—Sheet 5.

H. H. CUMMINGS.
STONE SAWING MACHINE.

No. 601,789.

Patented Apr. 5, 1898.



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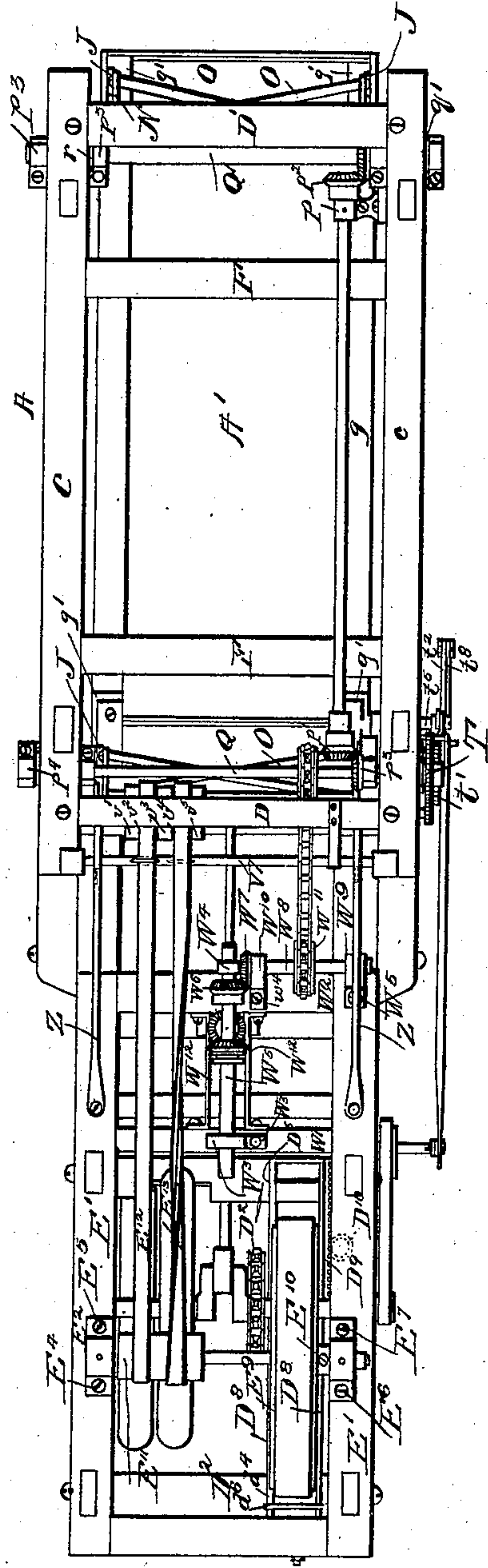
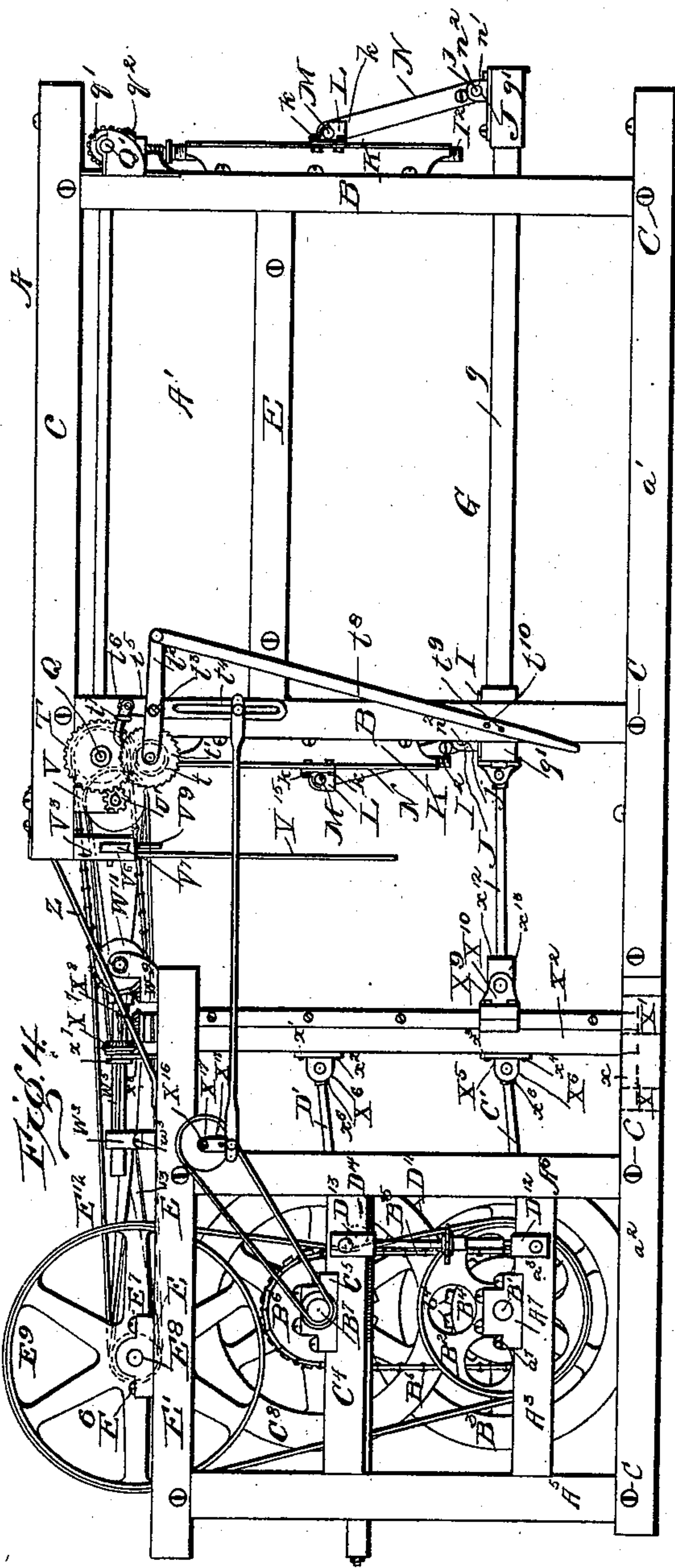
(No Model.)

6 Sheets—Sheet 6.

H. H. CUMMINGS.
STONE SAWING MACHINE.

No. 601,789.

Patented Apr. 5, 1898.



Witnesses.
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UNITED STATES PATENT OFFICE.

HARRY HARRISON CUMMINGS, OF DOBBS FERRY, NEW YORK.

STONE-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 601,789, dated April 5, 1898.

Application filed October 9, 1896. Serial No. 608,357. (No model.)

To all whom it may concern:

Be it known that I, HARRY HARRISON CUMMINGS, a citizen of the United States of America, residing at Dobbs Ferry, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Stone-Sawing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to stone-sawing machines, and has for its object to produce such a machine as will be strong, durable, and efficient; and it consists in the construction and combination of the novel features of the same, as will be hereinafter more fully set forth.

In the accompanying drawings, to which reference is made and which fully illustrate my invention, Figure 1 is a side elevation of the power-section of the machine. Fig. 1^a is a side elevation of the saw-sash section. Fig. 2 is a top or plan view of the power-section. Fig. 2^a is a top or plan view of the saw-sash section. Fig. 3 is an end view of the saw-sash section. Fig. 4 is a side elevation of the entire machine. Fig. 5 is a plan view of the same. Fig. 6 is a detail view.

The letters I² do not designate the tubular extensions, but the feed-screws, as clearly shown in Fig. 1^a.

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

Referring to the drawings, A designates a rectangular framework composed of two sections A' and A², each section consisting of a bed or supporting-section *a* and *a'*, which rests upon the ground, and the latter adapted to receive a stone to be cut into slabs. The meeting ends of the bed portions of the sections are rigidly secured together by means of screws or any suitable fastening adapted for the purpose. Rising from the bed or supporting portion *a'* and the section A' are four uprights B B B B. These uprights are rigidly secured at their lower ends by means of screws C C C C to the bed-piece *a'* and at their upper ends similarly secured to longitudinal beams *c c*, whose ends are secured together by means of transversely-arranged and shorter beams D and D'. Comprised within the bed-piece section *a'*, uprights B B B B,

longitudinal beams *c c*, and transverse beams D and D' of this section A' are longitudinal beams E E, the ends of which are secured to the inner faces of the uprights B B B B, and near the ends of these beams E E, which are secured to the uprights, are secured transversely-arranged shorter beams F F. The opposite section A² of the framework A being a duplicate to that of A', with the exception that it has a couple more longitudinal shaft-supporting beams and it is somewhat smaller in its construction, a further detailed description of this section is herein considered as unnecessary.

G designates a rectangular saw-sash or gate carrying a gang of saws, which gate is composed of two round longitudinal bars *g g*, having T-shaped ends *g' g' g' g'*, which take into the ends of longitudinal slots *g² g²*, formed between upper and lower transversely-arranged guide-plates H H H and secured therein by means of screws *h h h h*, which are also passed through perforations *h' h' h' h'* in the ends of metallic plates I I I I, which secure them to the upper faces of the plates H H H H. Said screws also serve to secure the horizontal lower portions of angle-irons J J J J to the plates I I, the upper portions of said angle-irons having perforations *j j j j*, for the purpose explained hereinafter.

K K K K designate vertical guideways secured in any suitable manner to the outer faces of each of the uprights B B B B. Near the lower ends of these guideways are transversely arranged and adjustably secured thereto shaft-hangers or bearing-boxes L L L L, which receive loosely and operatively hold the ends of transversely-arranged revoluble shafts M M, from which the saw-sash or a gate carrying the gang of saws is suspended through the medium of links N N, the upper ends of which are perforated, as at *n n n n*, as clearly shown in Fig. 1^a of the drawings, and through which the shafts M are passed. The lower ends of these links have smaller perforations therein, as at *n' n' n' n'*, which aline with the perforations in the upper vertical portions of the angle-irons, secured upon the ends of the sash and through which pins *n² n² n² n²* are passed, thus pivotally and loosely connecting the saw-sash to

the lower ends of the links, which allows a reciprocating movement of the same—that is, of the sash.

O O O O designate braces, the ends of which are secured near the upper and lower ends of the links N N by means of screws o o o o, the said braces being cruciform in their arrangement.

The adjustable shaft-hangers or bearing-boxes L L L L are provided with short rear vertical tubular pin extensions I' I' I' I', which take into the guideways K K K K. Through these rear tubular extensions elevating and lowering feed-screws I² I² I² I² depend.

P P P' P² P³ P⁴ designate power operating-shaft-supporting bearings secured to the upper ends of the uprights B B B B, two of which, P P, being located upon the inner faces of the two uprights, and four of which, P' P² P³ P⁴, upon the outer faces of the uprights, P P being located in a direction at right angles to P' P² P³ P⁴. Through the openings p p, formed in the brackets or bearings P P, is passed a longitudinal operating-shaft for operating the feed and ratchet mechanism of the machine and having keyed to each end thereof miter-gears p' p², which mesh with miter-gears p³ p⁴, keyed upon one end each of two right-angular feed-screw shafts Q Q'. The ends of the actuating feed-screw shafts Q Q' are passed through the openings q q, formed in the brackets or bearings P' P², secured to the outer surface of the uprights, and are also provided upon their ends with miter-gears q' q', which mesh with miter-gears q² q², keyed to the upper end of vertical feed-screws, which traverse the guideways. To the extreme outer end of the shaft Q', which is held in the bearing P³ and keyed to said shaft in the usual manner, is a miter-gear r, this miter-gear meshing with the miter-gear keyed to the upper end of the vertical downwardly-depending feed-screw in the guideway from the bracket or bearing P³. Near the extreme end of the shaft Q, which is held in the bracket or bearing P⁴, and adjacent to the miter-gear, which meshes with the miter-gear upon the longitudinal shaft, is another miter-gear s, which meshes with a miter-gear t, keyed to the upper end of vertical downwardly-depending feed-screw, which operates this feed-screw.

T designates a cog-wheel which is keyed or secured to the outer end of the shaft Q. This cog-wheel meshes with a pinion t upon the inner face of a ratchet-wheel t', which is in turn pivoted to the shorter end of a loosely-pivoted lever t², having its fulcrum, as at t³, near the upper end of a vertically-slotted vertical depending arm t⁴, secured to a block t⁵, interposed between said arm and upright B near the upper end of the same. To the extreme upper end of this arm is pivotally secured an operating-pawl t⁶, which engages the ratchet-wheel t' and also a keeper t⁷, secured to the upright B in juxtaposition to the pawl. To the longer end of the fulcrum-lever t² is

pivotally secured a connecting-rod t⁸, having in its free end a suitable number of perforations t⁹, which engage with a pin t¹⁰, secured to the outer face of the upright B near its lower end. By means of this connecting rod or lever the feedworks can be thrown in and out of gear. The cog-wheel T meshes with a pinion U, rigidly secured upon the end of a parallel shaft U', which is passed through the holes U², formed in the lower end of depending hangers V, secured to the under side of the inner ends of the longitudinal beams c c. To this shaft is also secured and carried upon its extreme opposite end a series of power-transmitting bands or belt-pulleys v' v² v³ v⁴ v⁵.

V² V³ designate belt-shipping angular hangers secured to the inner face of the ends of the longitudinal beams c c by means of screws B³ B⁴. The lower ends of these hangers are provided with slots V⁵ V⁶, through which is passed a belt-shipping bar V⁷, having belt-guides V⁸ V⁹, located adjacent to one another upon the opposite edges of said bar near its end.

V¹⁰ V¹¹ designate stop-pins projecting from the outer end of the belt-shipper bar near each end thereof. These pins regulate the extent of movement of the bar.

V¹² designates an angular hanger secured to the top of the transverse beam D' near its end. The downwardly-projecting end of this hanger is provided with a slot V¹³, within which a pin V¹⁴, secured upon the end of an operating shipping-lever V¹⁵, plays, the shipping-lever having its fulcrum upon the shipping-bar near one of its ends. Through the medium of this shifting lever, the shipping-bar carrying the belt-guides thereon through which the pulley-belts are passed, the operator is enabled to shift the belts to suit him over the series of pulleys as occasion demands. These pulleys, with the exception of the central pulley, are loosely secured upon their shaft, and in conjunction with a sprocket-pulley secured upon the shaft Q, over which a sprocket-chain is passed, connects through the medium of the belts on the belt-pulleys and sprocket-chain on the sprocket-pulley of their respective shafts other power-operating devices carried by the smaller section A² of the framework A, which will now be described.

Referring now to section A², A³ A⁴ designate longitudinal beams having their ends mortised in the inner faces of uprights A⁵ and A⁶, near the lower ends thereof, where said uprights are secured to the bed portion a by means of screws or other adaptable fastening means. In the upper surface of these beams and in alinement with each other are mortised-out pieces of the beams, in which are let journal or bearing boxes A⁷ A⁸, and which are secured therein by means of screws a⁷ a⁸ a⁹ a¹⁰. Loosely and revolvably mounted within these journal-boxes A⁷ A⁸ is a transversely-arranged double-crank shaft B', upon which is keyed near one end a belt-pulley B², having one end of an endless belt passed

around the same, and upon the opposite end of this shaft is keyed a balance-wheel B³. To the double-crank shaft B' is also keyed or secured, near the center thereof, a sprocket-pulley B⁴, having sprocket-teeth b⁴ secured to its periphery, over which is passed a sprocket-chain B⁵ to another sprocket-pulley B⁶, located in alinement with B⁴ and keyed to an upper double-crank shaft B⁷.

C' designates a pitman-rod, the head or rear end of which is formed in two sections, and each section is clamped and screwed together centrally around the double-crank shaft B' by means of screws C² C³, thus forming pitman-rod boxes upon this end of this pitman-rod, the forward end of which is secured to a guide-rod which will be presently explained.

C⁴ C⁴ designate another set of upper longitudinal beams mortised out on their upper faces and having journal-boxes C⁵ C⁵ constructed and let therein in a similar manner to the preceding ones below and located in alinement with them. Mounted within these boxes is another crank-shaft C⁶, similar to that of B', and keyed to this crank-shaft is another sprocket-pulley C⁷, similar to that of the sprocket-wheel B⁴, and keyed to the crank-shaft C⁶ and opposite to the sprocket-pulley C⁷ is another balance-wheel C⁸, similar to the balance-wheel secured to the double-crank shaft B'.

D' designates another pitman-rod the rear end of which is constructed and centrally secured to the double-crank shaft C⁶ in a similar manner to that of C', which is secured to the double-crank shaft B'. The forward end of this pitman-rod is secured to the same device and in the same manner as the previously-described pitman-rod C', and as in regard to the pitman-rod C', as hereinbefore stated, the connection of this pitman-rod D' will be hereinafter explained.

D² D² designate transversely - arranged beams having their inner ends mortised in the inner faces of four uprights D⁴ D⁵ D⁶ D⁷. Near one end of each of these beams are cut transverse kerfs d⁴ d⁵, and within these kerfs are held, by means of a keeper d⁶, the ends of a rectangular belt-tightening frame D⁸, having a rack D⁹ formed integral or secured upon the outer surface and near one end, within which a pinion D¹⁰ meshes, which is keyed on the upper end of a vertical hand-wheel rod D¹¹, the lower end of said rod being stepped in bearings in an angular bracket D¹², secured to one end of the lowest longitudinal beams. The upper end of this rod D¹¹ is revolvably secured in an angular bracket D¹³, secured to an upper longitudinal beam, near the end thereof. Secured transversely within and near one end of the belt-tightening frame is an adjusting-roller D¹⁴, which contacts with the face of the belt. Through the medium of the vertical hand-wheel rod D¹¹ and the tightening-frame, rack, pinion, and roller the desired tension of the pulley-belt can be regulated at will, and to stop the machine when

desired the frame slides ahead again, so that it slacks the belt, which slides around the bottom of the lower pulley and still keeps running on the line-shaft, as does also the crank on the end of the line-shaft, and to start the machine a reverse movement is given to the belt-tightening frame. This upper portion of the endless belt which is passed over the large pulley completes the circuit of the belt, the lower portion having been passed over and around the lower belt-pulley, hereinbefore described.

E' E' designate longitudinal top beams, upon the upper faces of which are secured journal-boxes E² E³ by means of screws E⁴ E⁵ E⁶ E⁷. Mounted revolvably within these journal-boxes or bearings and upon the beams E' E' is a line-shaft E⁸, which carries upon one end thereof a large belt wheel or pulley E⁹, rigidly secured to the shaft by means of a set-screw E¹⁰. Upon the opposite end of this shaft is rigidly secured and carried a smaller belt-pulley E¹¹, over which are passed two operating endless belts E¹² and E¹³, one of said belts being arranged in a straight line and the other one of which is crossed, are also passed around a series of pulleys, the center one of which being rigidly connected to the rear shaft, journaled in the hangers secured to section A', the rest of said pulleys revolving loosely on said shaft, as hereinbefore described. By such an arrangement of pulleys and belts, in conjunction with the feed-screw mechanism, the convenient elevating and lowering of the saw-sash is accomplished, the straight or open belt providing for the lowering of the same and the cross-belt giving a reverse motion for its elevation. W' W² designate transverse parallel short beams tenoned or otherwise secured to the inner or forward end of the longitudinal beams E' E' of this section. W³ designates a shaft-bearing bracket or journal-box secured at its outer end, by means of a screw w³, to the upper face of the beam W'. W⁴ designates a shaft-bearing journal-box or bracket secured at its lower end to the outer face and side to beam W² and alining with the bracket-bearing W³. Through the upper perforated portion of these bearings is passed a revolvable shaft W⁵, having a feather secured therein, and upon said shaft, near one of its ends, is carried a bevel or miter gear W⁶, which meshes with a bevel or miter gear W⁷, keyed upon the inner end of a revolvable shaft W⁸, supported and arranged at right angles to the former shaft W⁵ in the upper ends of the journal-bearings W⁹ W¹⁰, having their lower ends secured to the upper face of the transverse beams W² by means of screws w⁴ w⁵.

W¹² designates guideway - plates having their ends bent at right angles and secured to the inner faces of the transverse beams forming a part of the projecting forward part of the framework-section A².

W¹¹ designates a sprocket-pulley having sprocket-teeth secured in its periphery and

centrally secured upon the shaft W^8 . Over this sprocket-pulley is passed a sprocket-chain, which makes connection with another alining sprocket-pulley previously described in section A' of the framework A . These sprocket-pulleys, connected by their sprocket-chains, connect the feathered shaft W^5 and its bevel or miter gear W^6 with the shaft W^8 and its miter or bevel gear W^7 . Through the agroupment and arrangement of these intermediate shafts and miter or bevel gears, in connection with the belt-pulleys, balance-wheels, and sprocket-pulleys and small pulley on line-shaft of this section, the rear end transverse parallel shafts under pulleys, feed mechanism, and feed-screws in section A' and guide-rod screws in section A^2 are immediately operated between the said section, the rod connecting the inner end of the saw-carriage and guide-rod in section A^2 , the former being on a level continually with the end of the carriage or gate. It matters not whether the carriage is at the top of the section A' or down to its lower point of descent, the connecting-rod remains on a level.

ZZ designate stay-rods having one end each secured to the forward-projecting part of section A^2 and their opposite ends secured to the rear part of section A' , thus uniting the said sections at their upper ends.

$X'X'$ designate transverse beams tenoned or secured to the inner faces of the bed or support of the section A^2 . These beams are mortised out centrally for the reception of a transverse guide-rod plate x , which is secured therein, which receives the lower ends of two parallel guide-rod sections X^2X^3 , which traverse said plate.

X^4X^5 designate lug-supporting plates secured to the outer face and near the lower and upper ends of the guide-rod section X^2 by means of screws $x'x^2x^3x^4$, and secured to or formed integrally with these plates are lugs X^6X^6 , which engage with and to which are secured blocks x^6x^6 of the pitman-rods previously described.

X^7X^8 are miter-gears, the neck of the former being secured to the shaft W^5 . Upon the same—that is, upon the neck of the miter-gear X^7 —is formed an annular groove x^7 , which engages the forked end of a narrow metallic plate x^8 , secured to the side and upper end of the guide-rod X^2 , X^8 being secured to the upper end of a vertical screw which is passed through a perforation in a metallic plate secured to the upper end of the guide-rod, said miter-gear X^8 being arranged at right angles to X^7 and meshing therewith, the gear X^7 sliding back and forth with the shaft W^5 , the gear revolving simultaneously with the reciprocation of the shaft, these gears keeping in mesh with each other continually. This vertical screw takes in a guideway formed in the guide-rod section X^3 .

X^9 designates a plate or clamp having formed integral therewith, upon its inside,

a tubular extension x^9 , through which is passed the vertical screw x^8 , and secured upon its outer or opposite face are lugs $X^{10}X^{11}$. These lugs engage a block x^{12} , secured to one end of a horizontal rod x^{13} , the opposite end of this rod having a similar block x^{14} secured thereon and also secured to and engaging with lugs $X^{12}X^{13}$, secured to the transverse saw-guide head at the inner end of the sash or gate supported in the framework-section A' through the medium of its transverse end supporting-shaft hereinbefore described.

$X^{14}X^{15}$ designate journal-bearing boxes or brackets secured to the upper ends and outer faces of the two inner uprights of the bed-piece a by means of screws $x^{15}x^{16}$. Within these blocks is journaled and supported a transversely-arranged feed-mechanism-operating shaft X^{16} , having a fixed pulley X^{17} secured thereon near its outer end. Over this pulley is passed an endless belt X^{17} , and which is also passed over the projecting end of the upper power operating sprocket-pulley shaft. To the extreme end of the shaft X^{16} is secured one end of a perforated short right-angularly-arranged link X^{18} . To the free end of this link is adjustably secured one end of a feed-mechanism rod, the opposite end of this rod being adjustably secured to the depending slotted arm of the feed mechanism hereinbefore described in section A' of the framework.

The operation of the machine will be obvious in view of the foregoing description, taken in connection with the accompanying drawings, and a rehearsal of the same is herein deemed unnecessary.

Having thus described my invention, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. In a stone-sawing machine, the combination, with a frame, one end of which is provided with longitudinal beams, of short shafts, one above the other, a pulley upon each of the upper shafts, and two driving-pulleys upon the lower one, a belt from the lower pulleys to each of the upper pulleys, a frame upon said beams provided with a toothed rack, a pulley in one end of the rack adapted to engage with the belt from the lower to the upper pulley, a rod, one end of which is provided with a gear-wheel in engagement with the rack, a hand-wheel upon the rod, a sash suspended in the frame, and means for connecting said sash with the two lower shafts, substantially as set forth.

2. In a stone-sawing machine, the combination, with a frame, of a sash suspended at one end of the frame and operating mechanism at the other end, a reciprocating frame intermediate the sash and the operating mechanism, a clamp within the frame, a rod for connecting the clamp with the sash therewith, a vertical screw-threaded shaft through the clamp, a longitudinal shaft journaled in the main frame above the reciprocating frame, and mechanism connected with the upper end

of the screw-threaded shaft and longitudinally movably connected with the longitudinal shaft, substantially as set forth.

3. In a stone-sawing machine, the combination, with a frame, provided with posts, of
5 hangers upon the posts, a sash suspended from the hangers, a reciprocating frame at one end of the sash and provided with a clamp, means for moving the reciprocating frame, a vertical
10 screw-threaded shaft through each of the hangers and the clamp, a train of gearing

connected with the screw-threaded shafts, and means for operating the gearing continuously or intermittently, substantially as set forth.

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

HARRY HARRISON CUMMINGS.

Witnesses:

FRANK S. LYNT,
BENJAMIN F. SMITH.