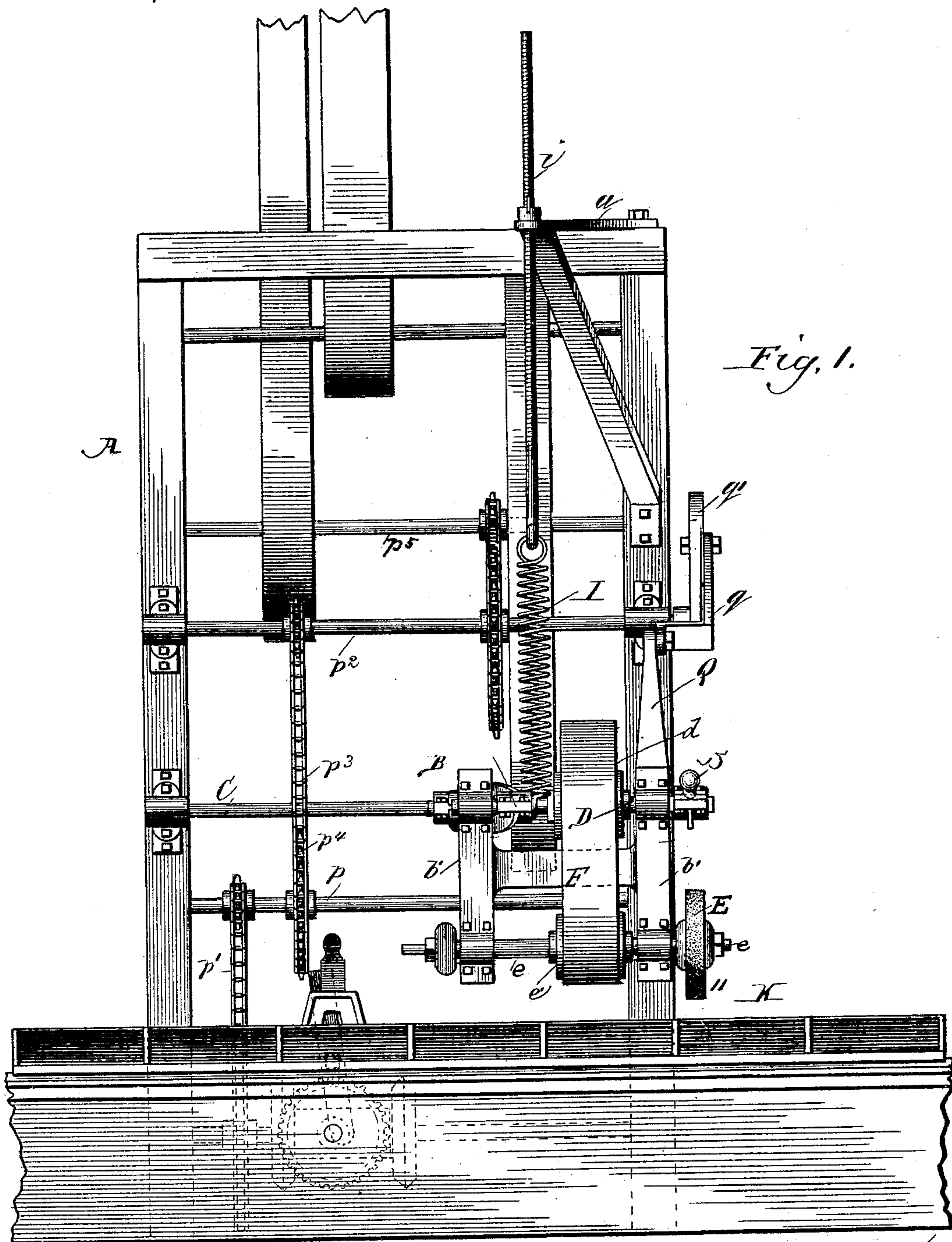


4 Sheets—Sheet 1.

No. 462,394.

Patented Nov. 3, 1891.



Witnesses

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Fredt. A. Wall.

Inventor

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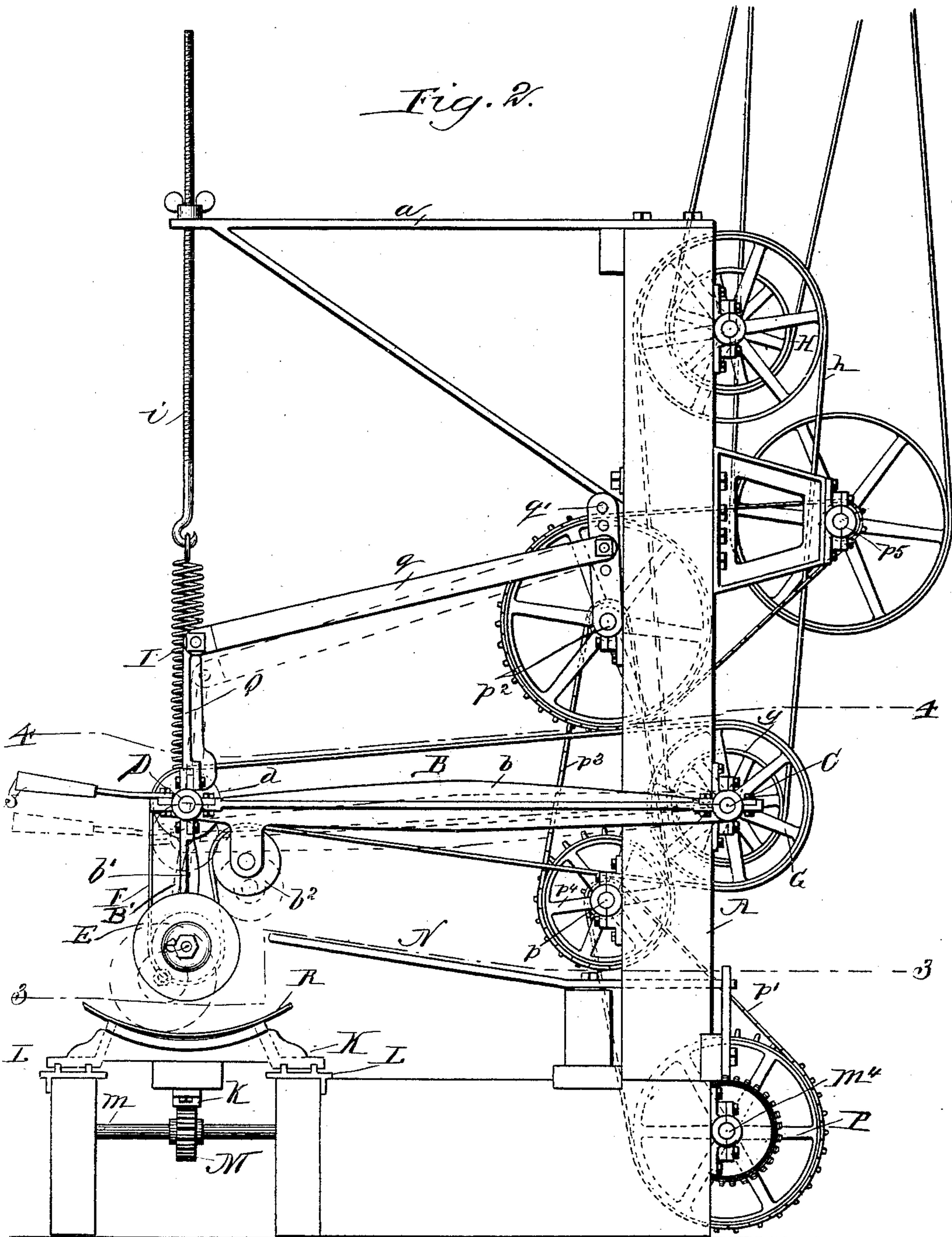
(No Model.)

4 Sheets—Sheet 2.

A. CAMERON.
EMERY GRINDER.

No. 462,394.

Patented Nov. 3, 1891.



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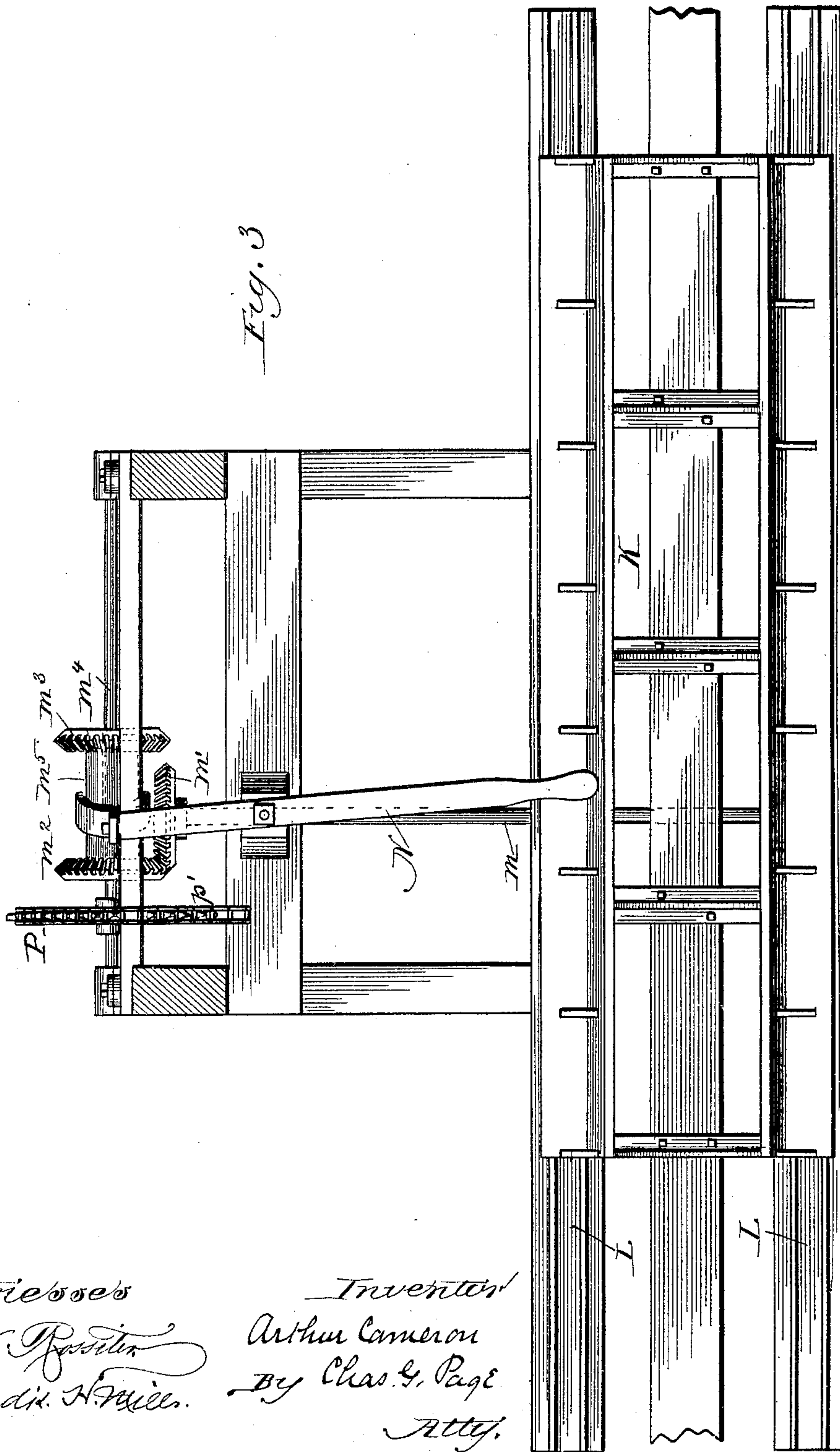
(No Model.)

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A. CAMERON.
EMERY GRINDER.

No. 462,394.

Patented Nov. 3, 1891.



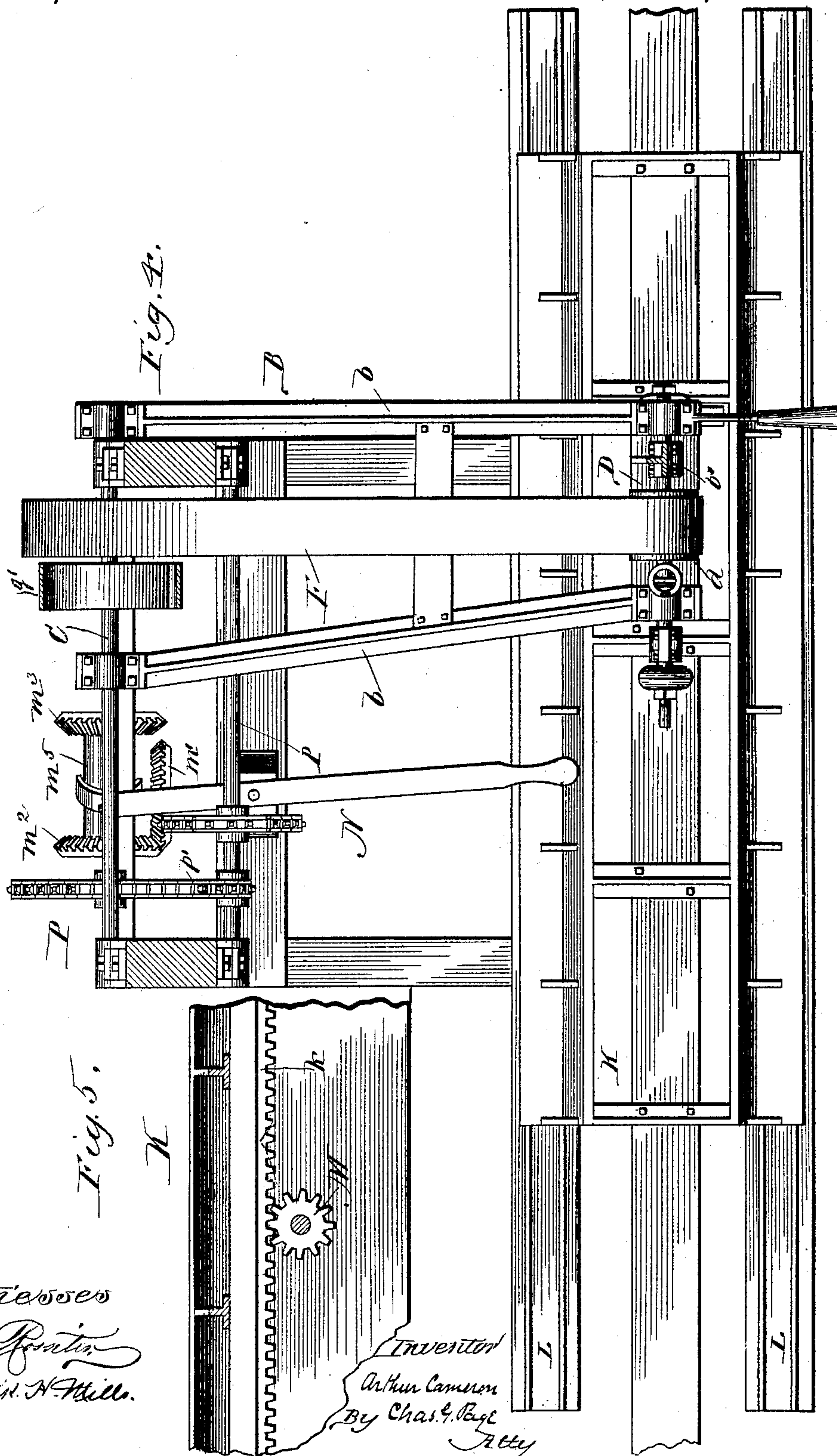
(No Model.)

4 Sheets—Sheet 4.

A. CAMERON.
EMERY GRINDER.

No. 462,394.

Patented Nov. 3, 1891.



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UNITED STATES PATENT OFFICE.

ARTHUR CAMERON, OF CHICAGO, ILLINOIS, ASSIGNOR TO FREDERICK C. AUSTIN, OF SAME PLACE.

EMERY GRINDER.

SPECIFICATION forming part of Letters Patent No. 462,394, dated November 3, 1891.

Application filed September 25, 1889. Serial No. 325,087. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR CAMERON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Machines for Grinding Concave Scraper-Blades, of which the following is a specification.

My invention relates to a machine for grinding and polishing concave scraper-blades which are employed in road-scraping machines. Said blades as now made are concave in cross-section, and as a rule the concavity is not on a true circle, in addition to which irregularity of shape the blades usually have a slight twist from end to end.

The object of my invention is to provide a machine for rapidly, conveniently, and accurately grinding and polishing the faces of said blades. In a grinding-machine characterized by my invention the grinding and polishing wheel is continuously driven and is carried by a jointed support, which is so articulated that one of its sections or members, which is pivotally suspended from the other member or section, may vibrate, so as to carry the emery-wheel back and forth across the face of the blade, while the said other section or member is so pivotally supported that during operation its free end may rise and fall in conformity with the transverse curvature of the blade which is being ground and polished by the emery-wheel. The jointed support is desirably suspended by a counterbalance-spring, which can be adjusted so as to vary the pressure of the emery-wheel upon the blade and also so as to permit the jointed support to be readily lifted by an attendant at any desired moment. The blade is held upon a traveling carriage, which can be caused to travel in either of opposite directions at the will of the attendant, and which is arranged to move the blade endwise in a direction transverse to the plane in which the grinding-wheel is carried by the vibratory pendent section of the swinging support. The swinging portion or section of the jointed support which carries the emery-wheel can be vibrated from a suitable power mechanism, or it can be operated by an attendant, which in some cases is found desirable.

In the accompanying drawings, Figure 1 is a front elevation of a machine embodying my invention. Fig. 2 represents the same in side elevation. Fig. 3 is a sectional plan, section being taken on line 3 3 in Fig. 2. Fig. 4 is a similar view, the section being taken on line 4 4 in Fig. 2. Fig. 5 represents in longitudinal vertical section a portion of the carriage and shows in elevation a portion of the rack with which it is provided.

In said drawings, A indicates an upright frame provided with bearings for the shafts or axles of such driving mechanisms as may be employed. The jointed support for the grinding-wheel comprises a substantially horizontally-arranged arm or section B, which is pivotally supported at one end upon the main frame or other suitable fixture, and which at its opposite end is connected by a suitable joint with the pendent vibratory arm or section B' of said support. The horizontal vibratory section B of the jointed support is hung at one end upon a shaft C and is conveniently formed as a frame comprising a couple of longitudinally-arranged bars or arms *b*, which are suitably connected together by one or more cross-pieces and hung at their rear ends upon said shaft C. The longitudinal bars of said frame are provided at their forward ends with bearings for a horizontally-arranged shaft or axle D, upon which an arm or frame adapted to constitute the pendent section of the jointed support is hung so as to vibrate freely. The pendent vibratory section of the jointed support, which may, for example, comprise a couple of side bars *b'*, carries a rotary shaft *e*, upon which the grinding-wheel E is mounted. Said shaft *e* is also provided with a pulley *e'* for a driving-belt F, which passes about said pulley, and which also passes over a pulley *d* on the shaft D at a point between the two sections. The belt F is driven from a pulley G on shaft C, Fig. 2, the upper leaf of said belt being carried from the pulley G to and over the pulley *d*, while the lower leaf of the belt is carried from the pulley G to and over a pulley *b''*, Fig. 2, which is supported by the upper horizontal section B of the jointed support. The pulley G can of course be driven in any suitable way, it being herein

shown as driven from the pulley H by a belt h , which passes from the pulley H to and about a pulley g' on the shaft C. The vibratory jointed support is partially counterbalanced by an adjustable spring I, which is suspended from an adjusting-rod i , adjustably connected with an overhanging portion a of the main frame, by which arrangement the weight of the jointed support can be nearly counterbalanced by said spring. The blade which is to be ground is carried by a reciprocating carriage K, arranged upon tracks L and provided along its under side with a rack k , which is engaged by a driving-pinion M. The pinion M is arranged upon a shaft m , which can be driven either way from a reversing-gear, so as to change the direction to which it is desired to move the work. As herein illustrated, the shaft m is provided with a bevel-gear m' , (see Fig. 3,) which can be engaged by either of the two gears m^2 and m^3 on a shaft m^4 . Said gears m^2 and m^3 are fixed upon a sleeve or hub m^5 , which is feathered upon the shaft m^4 , so as to rotate therewith, but slide thereon, the end shift of said hub, which is made to throw one or the other of the two gears into engagement with the gear m' , being effected by a lever N, which is arranged within convenient reach of the attendant. The shaft m^4 is herein provided with a sprocket-wheel P, which is driven from a sprocket on a shaft p by the link belt p' . The shaft p is driven from a sprocket on the shaft p^2 by a link belt p^3 , which engages the sprocket p^4 on shaft p , and in like manner the shaft p^2 is driven from a shaft p^5 by belting p^6 , applied to pulleys p^7 and p^8 , respectively, on said shafts p^2 and p^5 . By shifting the lever N the carriage can obviously be caused to travel either way. The pendent section B' of the jointed support is provided with an upwardly-extending arm Q, which by a link or pitman q is connected with a crank-arm q' on the shaft p^2 , by which arrangement the pendent section of the jointed support can be caused to vibrate, while at the same time the jointed support may as a whole rise and fall in conformity with the curvature of the blade that is being ground and polished by the wheel E.

In Fig. 2 I have shown the blade R arranged upon the carriage and have indicated in dotted lines the jointed support in position to cause the emery grinding-wheel to grind transverse the blade in a direction transversely to the length of the latter. The carriage is adapted for holding a concave scraper-blade, and the track is arranged so that the carriage holding the blade with its length transversely to the plane in which the wheel and its supporting section swing will in moving along the track move the blade endwise and in a direction transverse to the swing of the grinding-wheel, which moves back and forth across the blade.

Section B of the jointed support is provided with a horizontally-extending arm S, which can be taken hold of by an attendant

so as to lift the jointed support, for example, to the position indicated in full lines in Fig. 2. When so desired, the pitman q can be detached, and the pendent section of the jointed support can be vibrated by an attendant, who for such purpose will operate the arm Q, with which said pendent section of the jointed support is provided. This feature is particularly serviceable in grinding half of the width of the blade at a time, it being seen that the workman by operating the handle Q can vibrate the grinding-wheel across one-half of the width of the blade while the latter is being fed forward by the carriage, on which it is temporarily secured. The counterbalance-spring renders this hand manipulation exceedingly easy.

What I claim as my invention is—

1. The combination, substantially as hereinbefore set forth, in a machine for grinding and polishing concave scraper-blades, of a carriage arranged for supporting and moving a scraper-blade in the direction of its length, a belt-driven grinding-wheel and a jointed support therefor, comprising a vibratory pendent section carrying the grinding-wheel and arranged to swing transversely to the length of the blade upon the carriage, and a pivotally-supported vibratory section carrying the said vibratory pendent section at its free end, which is arranged to swing up and down, so as to provide a rising and falling support, from which the vibratory pendent section that carries the grinding-wheel is pivotally suspended.

2. The combination, substantially as hereinbefore set forth, in a machine for grinding and polishing concave scraper-blades, of a jointed grinding-wheel support comprising a pivotally-supported vibratory section free to swing up and down about its pivotal support and a pendent vibratory section pivotally suspended from the free end of said pivotally-supported section, a belt-driven grinding-wheel carried by the pendent vibratory section, and a pitman applied to the pendent vibratory section, so as to operate the same, and thereby cause the grinding-wheel to operate upon a scraper-blade.

3. The combination, substantially as hereinbefore set forth, in a machine for grinding and polishing concave scraper-blades, of the belt-driven grinding-wheel, a pendent vibratory support for the grinding-wheel pivotally suspended from a support which is free to rise and fall, a suitably-operated pitman applied to the vibratory support which carries the grinding-wheel as a means for vibrating said support, so as to carry the grinding-wheel across the scraper-blade, and a reciprocating carriage arranged for supporting a scraper-blade and moving the same endwise in a direction transversely to the plane in which the wheel and pendent support therefor vibrate.

4. The combination, substantially as hereinbefore set forth, in a machine for grinding and polishing concave scraper-blades, of a jointed grinding-wheel support comprising a

vibratory section B and a vibratory pendent section B', a belt-driven grinding-wheel carried by the vibratory pendent section, and an adjustable suspension-spring connected with the vibratory section B of said jointed support, for the purpose described.

5. The combination, substantially as hereinafore set forth, of a jointed grinding-wheel support comprising the vibratory section B, provided with a handle S, and a pendent vibratory section B', a belt-driven grinding-wheel carried by the pendent vibratory section, a driving-belt pulley G, a single endless belt arranged to drive the grinding-wheel from said driving-belt pulley, an idler-belt pulley for one leaf of the belt, arranged to turn about the axis of the joint between the two sections of the jointed support, and an idler-belt pulley for the other leaf of the belt carried by the jointed-support section B.

6. The combination, substantially as hereinafore set forth, of the grinding-wheel, a vibratory jointed support for said wheel having one of its sections arranged for carrying the wheel forward and backward across the work, a reciprocating carriage arranged for holding a concave scraper-blade with its length transversely to the plane in which the grinding-wheel is carried and mounted upon a track set to direct the carriage in a line transverse to the plane in which the wheel is carried and coincident with the length of a blade held upon the carriage, a rack secured to the carriage, a pinion M, engaging the rack, a rotary shaft m , carrying said pinion and provided with a bevel-gear m' , and a couple of gear-wheels m^2 and m^3 , keyed to slide upon a rotary power-driven shaft and arranged whereby they may be alternately brought into engagement with the bevel-gear m' .

7. The combination, substantially as hereinafore set forth, of the belt-driven grinding-wheel and a jointed support therefor, provided with belt-pulleys for the belting and comprising a pivotally-supported section B and a pendent vibratory section B', carrying the grinding-roll and provided with a handle Q, so that it may be operated either by a pitman applied to said handle or by a workman, who can grasp and operate said handle when the pitman is detached therefrom.

8. The combination, substantially as hereinafore set forth, in a machine for grinding and polishing scraper-blades, of a vibratory jointed two-part grinding-wheel support articulated so that its section which carries the grinding-wheel support may, while partaking of the vibratory motion of the other section, vibrate independently thereof and arranged so that its two sections may vibrate in one and the same plane, the belt-driven grinding and polishing wheel carried by its said allotted section of the vibratory support and mounted to revolve in the plane in which the support as a whole is arranged to vibrate, a straight reciprocating carriage adapted for holding a concave scraper-blade with its length transversely to the plane in which the grinding-wheel revolves and its concave face subject to the grinding-wheel, which is arranged to operate across the concave face of the blade transversely to the length and end movement of the latter, and a crank and pitman movement as a source of power for actuating the jointed support.

ARTHUR CAMERON.

Witnesses:

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