(No Model.) 4 Sheets—Sheet 1.

F. A. HALSEY & A. DONEY.

BAR CHANNELING MACHINE.

No. 564,993. Patented Aug. 4, 1896.

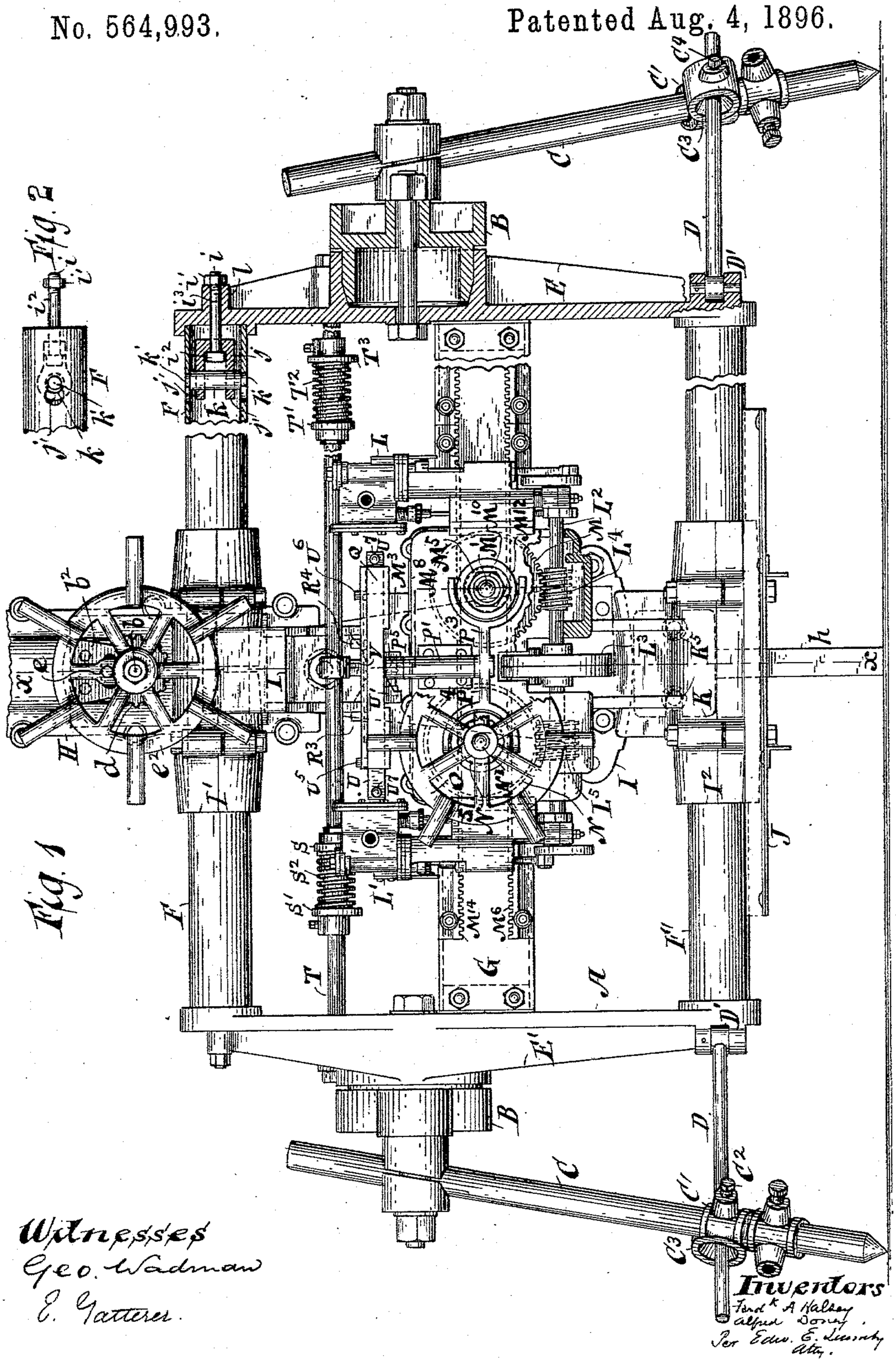

Fig. 1

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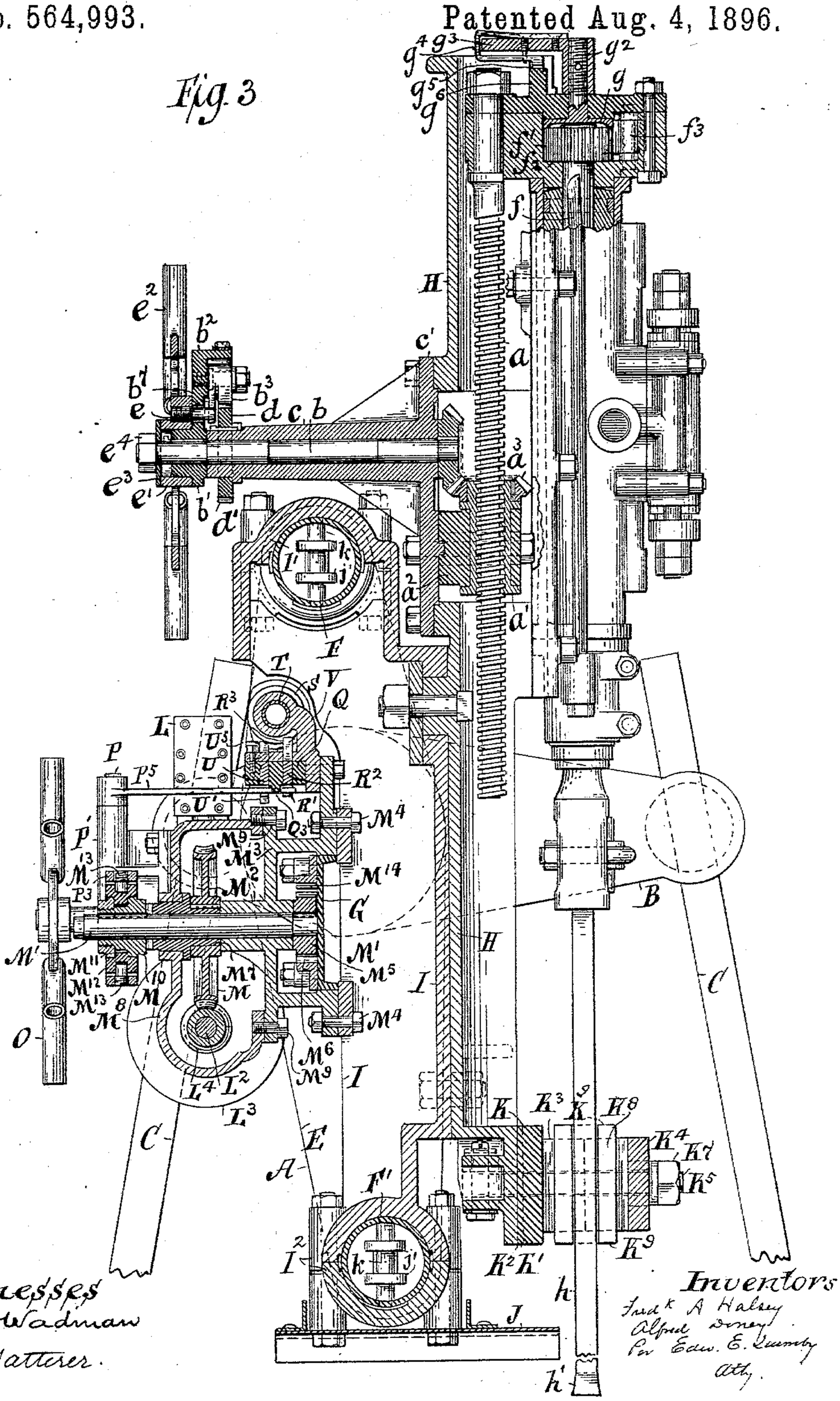
Fig. 3



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BAR CHANNELING MACHINE.

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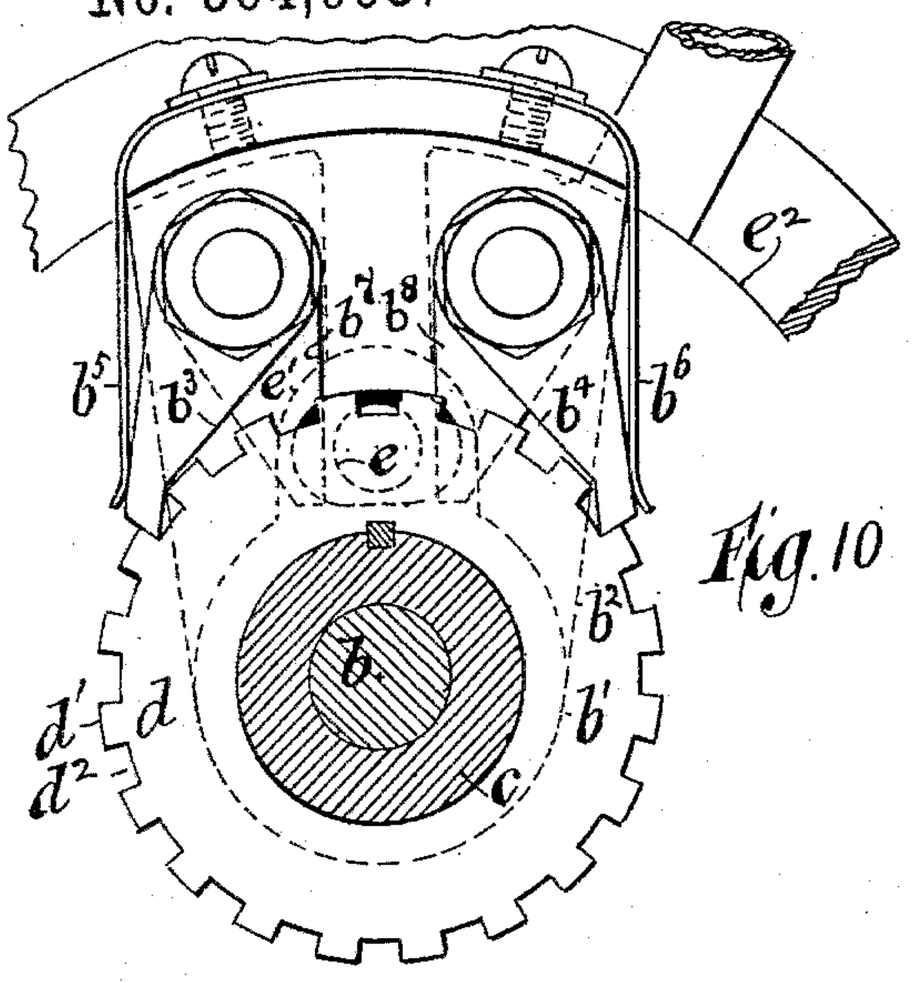
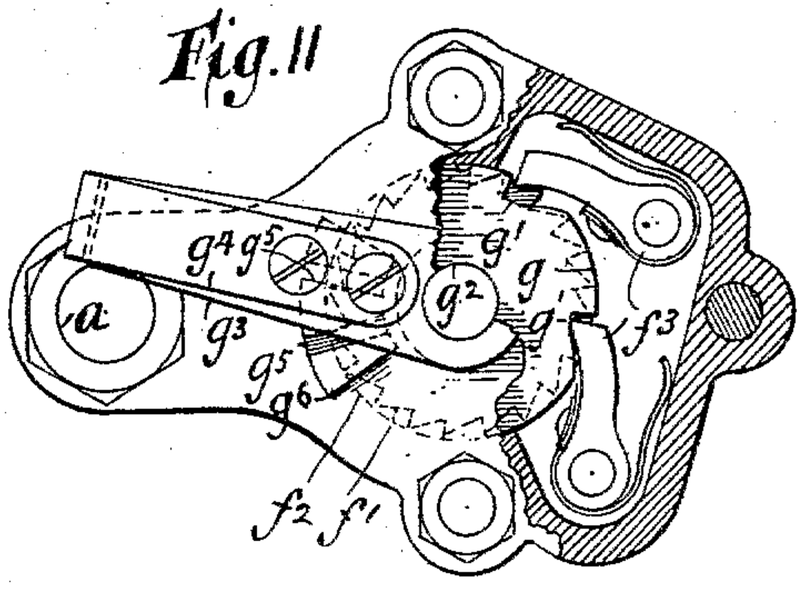
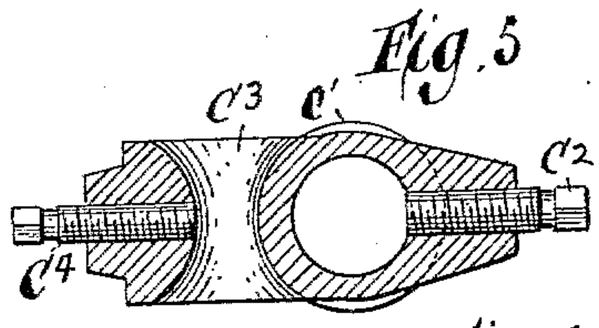
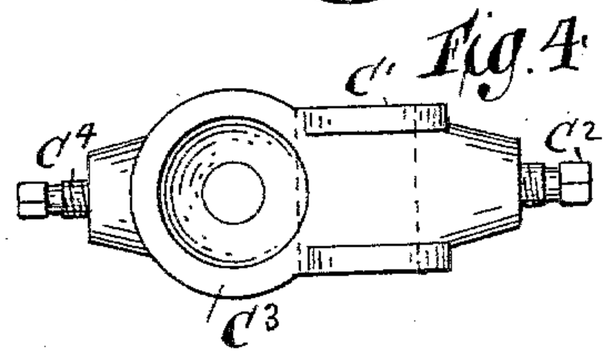
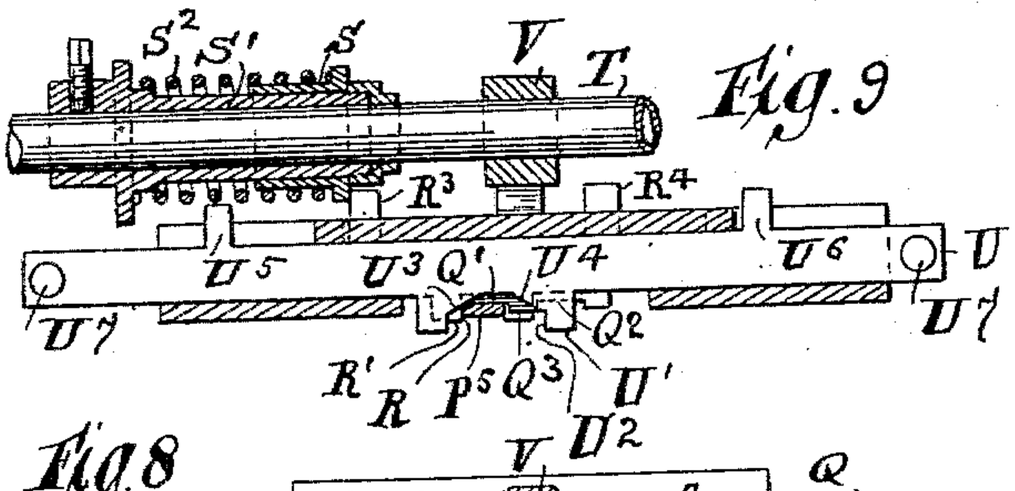


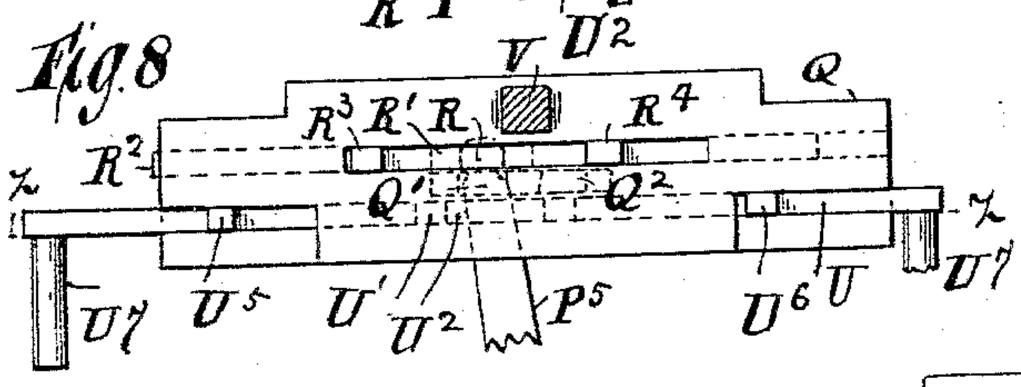
Fig. 10

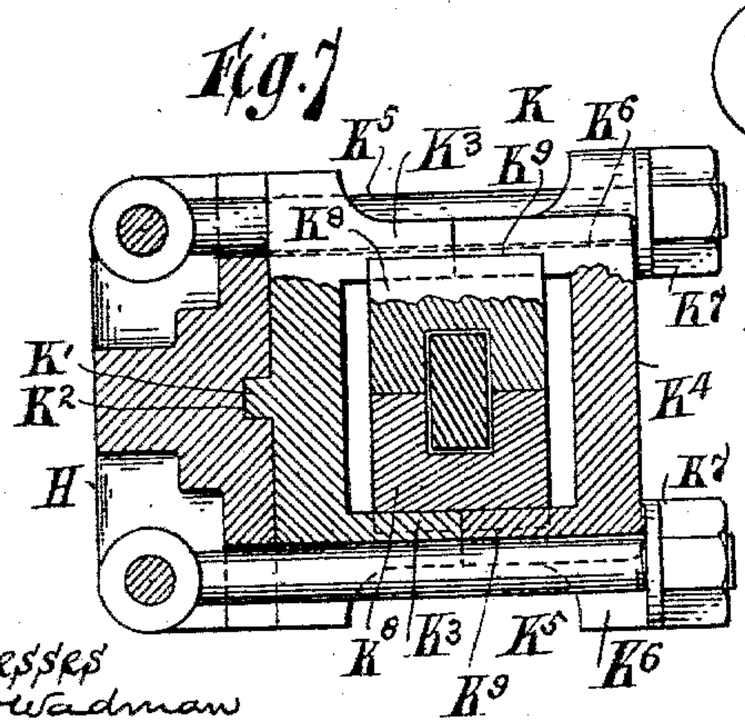


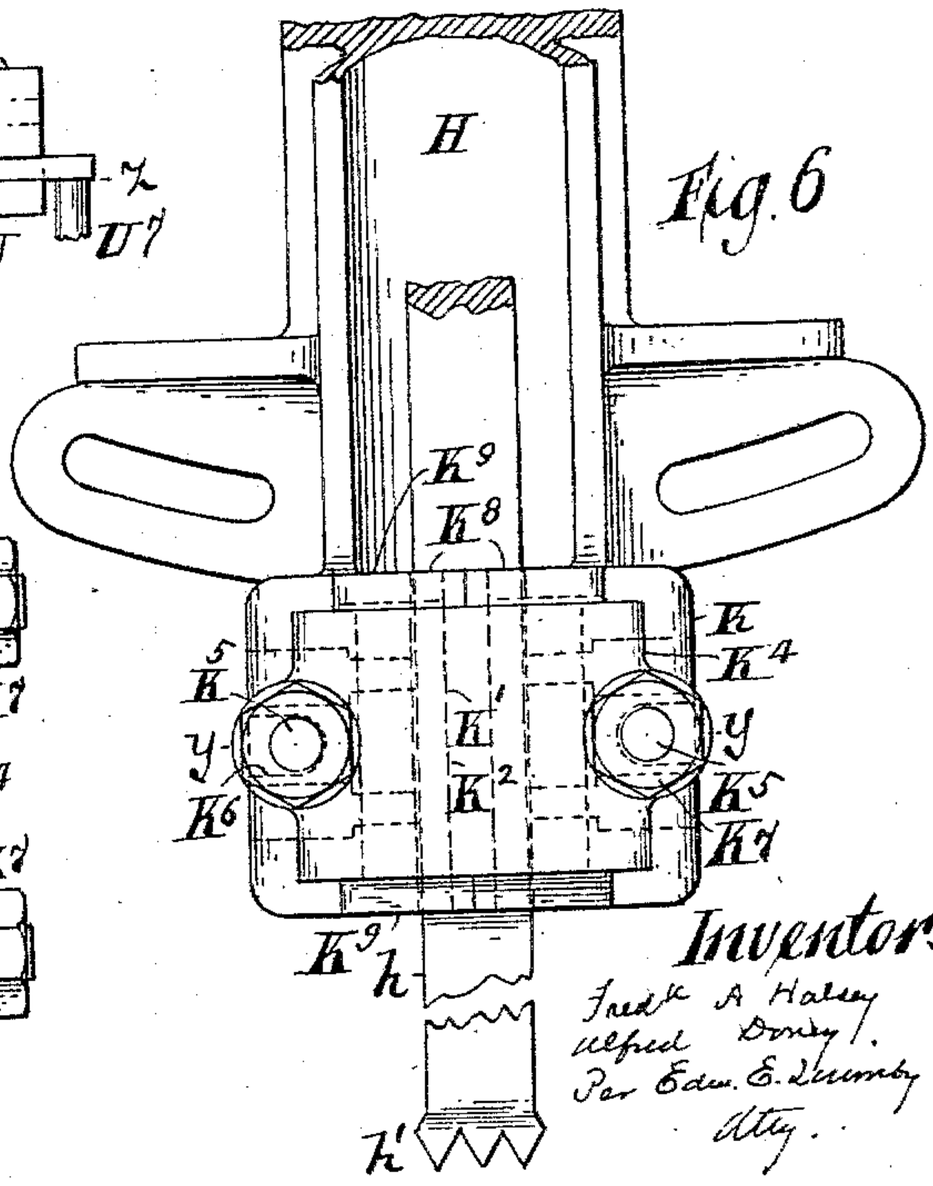












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F. A. HALSEY & A. DONEY.

BAR CHANNELING MACHINE.

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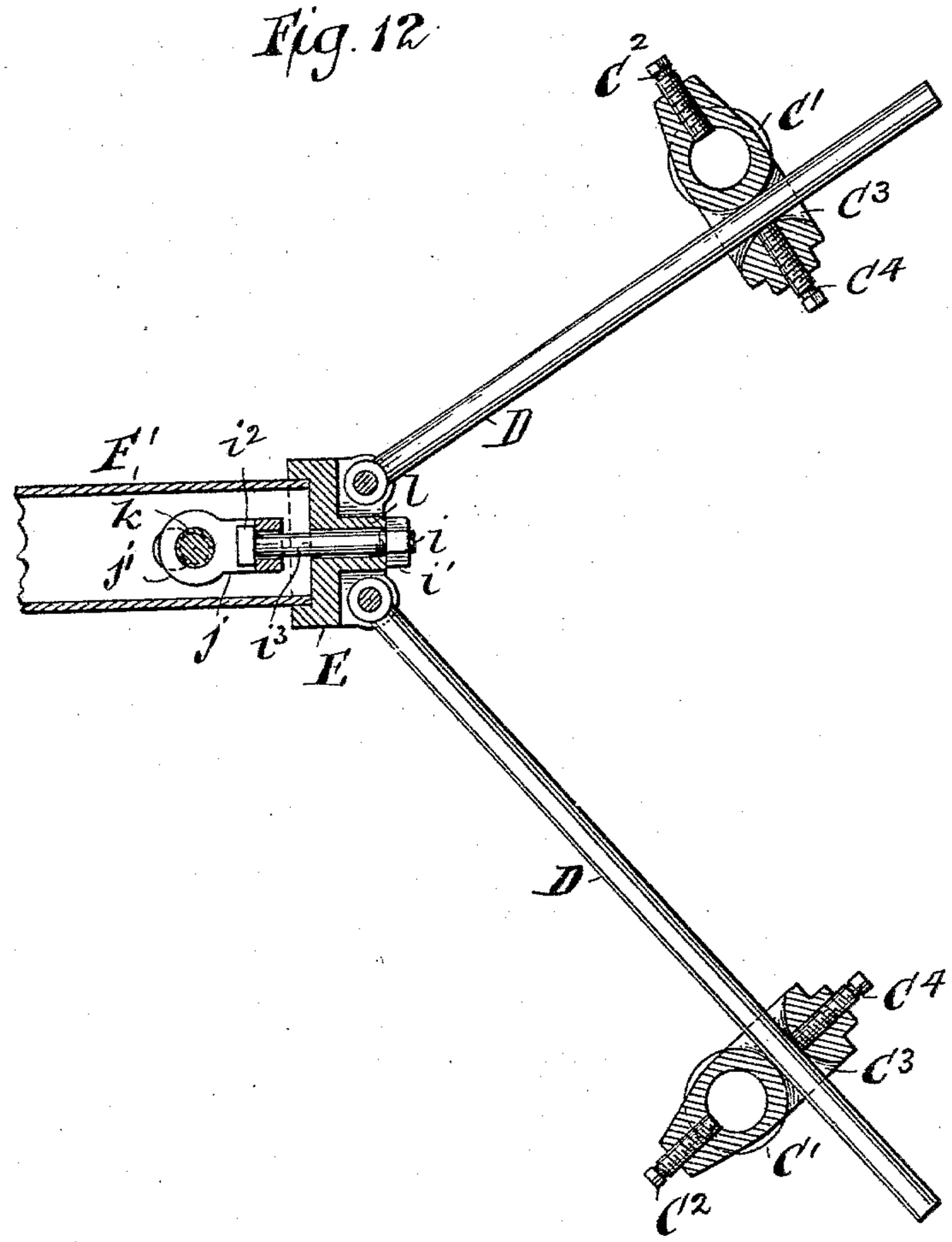
Fig. 12.



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UNITED STATES PATENT OFFICE.

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BAR-CHANNELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 564,993, dated August 4, 1896.

Application filed October 16, 1895. Serial No. 565,891. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK A. HALSEY, of New York city, New York, and ALFRED DONEY, of Pen Argyl, Pennsylvania, have invented certain Improvements in Bar-Channeling Machines, of which the following is a specification.

This invention embraces a variety of devices applied to a bar-channeling machine for improving its mode of organization, increasing its speed of operation, rendering it easy of control by the operator, and facilitating the adjustment of its parts.

In a bar-channeling machine a rock-drill and its appurtenances are mounted upon a rectangular frame having its opposite ends pivotally connected to horizontal bars, each of which is adjustably supported upon two pointed legs which are themselves adjustable to various angles.

The first part of this invention relates, broadly, to tying the lower side of the rectangular frame to the said legs, and incidentally embraces the use for that purpose of diagonal brace-rods pivoted to the lower corners of the rectangular frame and adjustably inserted through flaring tubular sockets formed on adjustable collars adapted to both slide and turn on the legs, and provided with set-screws by means of which they may be fastened in any desired position. The said tubular sockets flare at both ends, and are each provided with a set-screw for tightening the brace-rod in the socket in the place and at the angle which may be required by the relative positions of the legs and frame.

The second feature of the invention consists of a splash-plate which is fastened to the lower part of and moves with the rock-drill carriage and serves to intercept the splash from the channel in process of being cut.

The third feature of the invention consists of a readily-detachable guide adapted for loosely engaging and preventing the rotation of the cutting tool or tools. This device renders it unnecessary to employ the cross-head moving in slideways heretofore used in bar-channelers, and besides diminishing the cost of the wearing parts so greatly lessens the weight of the reciprocating mass that the machine can be run at a higher rate of speed than heretofore. The said guide is mounted in transverse ways, so that it is free to yield bodily in a direction crosswise of the channel in process of being cut, and hence accommodate itself to the small variations in the angle of inclination of the tool which occasionally occurs in operation.

The fourth feature of the invention relates to mechanism for automatically or manually imparting the horizontal feed motions to the sliding carriage upon which the rock-drill bed-plate is pivoted, and embraces the combination of the steam-cylinders and gearing for automatically feeding and automatically shifting the direction of the feed of the sliding carriage, with a clutch-lever susceptible of being manually moved into an inoperative position, and a hand-wheel for manually moving the sliding carriage when the said clutch-lever, by being moved into its inoperative position, has wholly released the sliding carriage from said automatic feeding mechanism.

In bar-channelers as heretofore constructed, whenever it was required to move the rock-drill in a horizontal direction to considerable distances for purposes of adjustment or otherwise, it has been necessary to employ the steam-actuated feeding mechanism for that purpose. By the expedient of disengaging the sliding carriage from its automatic feeding mechanism, and employing the hand-wheel described, the operator is enabled not only to move the sliding carriage when no steam is on, but is enabled to move it with considerable rapidity as compared with the necessarily slow rate of movement imparted to it by the automatic feeding mechanism.

The fifth feature of the invention consists of a ratchet-wheel and two stop-pawls for preventing the feed-screw from being caused to rotate in either direction by the jar of the machine when in use, the said device being combined with a manually-operative feed-wheel adapted to trip one or the other of the two pawls by the initial part of its rotation,

and to then impart rotation to the feed-screw to the extent and in the direction required. This device releases the operator from the necessity, existing in bar-channelers as heretofore constructed, of constantly keeping his hand on the feed-wheel. By merely so turning the feed-wheel as to move the feed-screw a sufficient distance to provide work for the machine for a few minutes the operator can leave himself free to devote his attention to other matters, such as tightening loose joints in steam-pipes, or tightening a loose bolt or making various adjustments without stopping the machine.

The sixth feature of the invention consists of a simple and effective device for throwing the rotation-ratchet into or out of action when occasion arises for changing the operation of the machine from that of channeling to that of drilling the end holes of a channel, or vice versa.

The seventh feature of the invention consists in the employment of a channel-bit made of a single piece of steel provided with a multiplicity of cutting edges in place of bits made in gangs, as heretofore, which have proved difficult to maintain of proper length because they are liable to wear unequally.

In pursuance of the intent to lighten the machine whenever permissible the invention also embraces a device employing short bolts for securing the upper and lower tubular members of the main swinging frame to the end members thereof, by the use of which the usual long bolts extending horizontally through the entire length of the tubular members of the frame are dispensed with.

While these improvements are independently useful, their association in a single machine, as herein described, is especially advantageous, because of the resulting lightness and portability of the machine and its capacity of rapid adjustment, whereby it is especially adapted for employment in situations where the bottom of the quarry is rough and irregular and where short channels are required, involving frequent moving of the machine.

The accompanying drawings of a bar-channeler containing the improvements are as follows:

Figure 1 is a front elevation, partly in section, in which portions of the longitudinal members of the main frame are represented as broken out. Fig. 2 illustrates a detail of construction of the frame. Fig. 3 is a transverse section of the machine, taken through the vertical planes indicated by the offset dotted line *x x* on Fig. 1. Fig. 4 is a side elevation of one of the socketed collars for firmly connecting the diagonal brace-rods to the legs. Fig. 5 is a longitudinal horizontal section of the same. Fig. 6 is a view of the lower part of the rock-drill bed-plate, showing in front elevation the box which contains the tool-guide. Fig. 7 is a top view of the guide-box, partly in horizontal section, taken through the plane indicated by the dotted line *y y* on Fig. 6. Fig. 8 is a top view of the stop-block and a portion of the sway-bar for shifting the clutches. Fig. 9 is a vertical section substantially in the plane indicated by the dotted line *z z* on Fig. 8 and showing details of the mechanism for automatically reversing the direction of the horizontal or side feed of the carriage. Fig. 10 is a rear elevation of the double pawl-and-ratchet device for preventing the jarring of the machine from actuating the vertical feed mechanism. Fig. 11 is a top view, partly in section, showing the device for rendering the rotary feed mechanism inoperative. Fig. 12 is a top view of two of the diagonal braces, showing in section the construction of the portion of the swinging frame to which the diagonal braces are pivoted, and also showing in section the adjustable sockets on the legs, in which the diagonal braces are secured by set-screws.

In the bar-channeler represented in the drawings the operative parts of the machine are mounted upon the usual oscillatable rectangular frame A, pivoted to two transverse horizontal bars B B, each end of each of which is supported upon an adjustably-inclined pointed leg C. Each leg is provided with a loosely-fitting collar C′, adapted to be fastened to the leg by the set-screw C^2, and having formed upon it a tubular socket C^3, the aperture through which flares at both ends. The sockets are also provided with set-screws C^4 for the purpose of fastening in the sockets the diagonal brace-rods D, each of which at its inner end D′ is pivotally connected to the lower corner of the frame A, and extends outwardly therefrom through the socket C^3 upon that one of the legs C which is adjacent to it. The frame A is composed of two vertical members E E′, the upper horizontal member F, the lower horizontal member F′, and the middle horizontal member G. The rock-drill cylinder and its appurtenances are mounted upon the usual swinging bed-plate H, pivotally supported upon the carriage I, adapted to slide to and fro upon the upper and lower horizontal members F and F′ of the frame, for that purpose being provided with a cylindrical two-part jaw I′, embracing the upper horizontal member F of the frame, and the two-part jaw I^2, embracing the lower horizontal member F′ of the frame. To the under part of the lower jaw I^2 there is fastened a splash-plate J, which is thus made to travel to and fro with the sliding carriage and serves to intercept the splash from the channel in process of being cut.

At a slightly higher level than the splash-plate is a guide-box K, provided upon its rear side with a vertical tongue K′, adapted to seat in a vertical groove K^2 in the lower part of the rock-drill bed-plate. On its rear side the guide-box is provided with laterally-projecting flanges K^3 K^3. It is also provided with

a removable cap K^4. The cap is secured to the box and the box is secured to the rock-drill bed-plate H by the laterally-swinging latch-bolts K^5 K^5, pivoted to the bed-plate H, extending outwardly therefrom through notches in the side flanges K^3 K^3, and through corresponding notches K^6 K^6 in the cap K^4, and provided upon their outer ends with nuts K^7 K^7, adapted when screwed home to bear upon the face of the cap K^4 after the latch-bolts have been swung into the notches described.

The guide for the tool, or "steel," as it is commonly called, consists of two similar pieces K^8 K^8, which upon their meeting faces are provided with vertical grooves adapted to loosely embrace the shank of the tool. They are also provided at their upper and lower ends with laterally-projecting flanges K^9 K^9 K^9 K^9, fitting loosely upon the top and bottom of the box and cap.

On reference to Figs. 3 and 7 it will be seen that the space within the guide-box K from front to rear is wider than the width of the guide, and that opportunity is thus afforded for a bodily lateral yielding movement of the guide in a direction which is crosswise of the plane of the channel which is being cut. It will also be seen that the top and bottom of the box K constitute ways upon which the flanges K^9 K^9 K^9 K^9 of the guide bear, and which define the path of travel of the guide during its bodily-yielding movements.

When occasion arises for changing the tool, the nuts K^7 K^7 are unscrewed and the latch-bolts are then both swung laterally. This releases the cap K^4 of the box K, so that the tool, after having been unfastened and lowered from the chuck to which when in use its upper end is fastened, can be removed from the box, together with the two pieces K^8 K^8 of the guide, after which it can be removed from the guide by separating the pieces K^8 K^8. The guide-pieces K^8 K^8 can then be slipped onto the shank of another tool and replaced in the box K, after which the cap K^4 is reapplied and the box and cap being held at the proper elevation the latch-bolts K^5 K^5 are swung inward into their proper notches and the nuts screwed home upon the face of the cap K^4. The new steel having been fastened in the chuck is then ready for use.

The sliding carriage has mounted upon it two steam-engines L L′ for rotating the worm-shaft L^2, having affixed to it the balance-wheel L^3 and the two worms L^4 and L^5, meshing, respectively, with two worm-wheels M and N, which are keyed to hubs loosely mounted upon the transverse shafts M′ and N′. The shaft M′ has a bearing in the box M^2, formed integrally with the box-frame M^3, which straddles the middle bar G of the frame A and is fastened to the carriage I by a suitable number of bolts, two of which, M^4 M^4, are shown in Fig. 3. The shaft M′ has affixed to its inner end a pinion M^5, which meshes only with the teeth of the horizontal rack M^6, bolted to the lower part of the middle bar G. As shown in Fig. 3, the shaft M′ extends outwardly through and beyond the hollow hub M^7, to which the worm-wheel M is keyed. The hub M^7 is afforded a bearing in the supplemental box-frame M^8, which is secured to the box-frame M^3 by a suitable number of bolts, two of which, M^9 M^9, are shown in Fig. 3. The outer face of the hub M^7 is provided with dogs adapted for engagement with corresponding dogs on the adjacent face of the clutch-box M^{10}, which is loosely splined to the projecting outer portion of the shaft M′, and is so constructed as to present a circumferential groove for receiving the tongue M^{11} of the ring M^{12}, which is loosely connected with the adjacent arms of the clutch-shifter by the pivots M^{13} M^{13}. The description thus given of the worm-wheel M, the shaft M′, its box, clutch, &c., applies as a description of the worm-wheel N, shaft N′, and its box and clutch, with the following exceptions: First, the shaft N′ is arranged at sufficiently higher level than the shaft M′ so that its pinion N^5 meshes only with the teeth of the horizontal rack M^{14}, bolted to the upper part of the middle bar G of the frame A. The worm-wheel N and worm L^5 are of slightly greater diameters than the worm-wheel M and worm L^4, but are of the same relative proportions. Secondly, the shaft N′ projects somewhat farther forward than the shaft M′ and has affixed to its outer end a hand-wheel O, by means of which, when the clutches are appropriately adjusted, the shaft N′ can be rotated and the sliding carriage I thus be moved manually in either direction.

The clutch-shifting device consists of the vertical rock-shaft P, having its bearing in the box P′, bolted upon the supplemental box-frame M^8. The collar P^2, secured to the lower end of the rock-shaft P, is provided with two radially-projecting arms P^3 and P^4, both having forked ends for pivotal connection with the clutch-box rings. The forked end of the arm P^3 operates the clutch-box loosely splined on the shaft M′, and the forked end of the arm P^4 operates the clutch-box loosely splined on the shaft N′.

The upper end of the rock-shaft P has fastened to it the backwardly-extending sway-bar P^5, the free end of which springs upwardly toward the under side of the stop-block Q, connected to and moving with the supplemental box-frame M^3. The stop-block Q has on its under side two recesses Q′ and Q^2, serving as stops for the sway-bar P^5. When the sway-bar by being seated against the under side of the partition Q^3 between the two recesses Q′ and Q^2 occupies its median position, so that both clutches are freed from engagement with the hubs of the worm-wheels, the carriage I can be moved manually by turning the hand-wheel O. When the sway-bar is seated in the recess Q′, as illustrated in

Figs. 3, 8, and 9, the arm P^3 is rocked inward and the shaft M′, being thus clutched to the worm-wheel M, is automatically fed in the direction, say, from right to left.

The rear end of the sway-bar P^5 is loosely contained in the recess R, formed upon the under side of the projection R′, extending downward from the horizontal slide-bar R^2, loosely seated in a suitable bearing formed in the stop-block Q. In addition to being slotted upon its under side to admit of the protrusion of the projection R′, the stop-block Q is also provided with slots on its upper side to admit the lugs R^3 and R^4, extending upwardly from the slide-bar R^2. As the carriage I approaches the end of its excursion to the left the lug R^3 is carried into collision with the yielding and resilient sleeve S, loosely mounted upon the fixed sleeve S′, adjustably secured to the horizontal bar T, which is fastened at its opposite ends to the side members E E′ of the frame A. After the collision of the lug R^3 with the yielding and resilient sleeve S and so long as the sway-bar P^5 remains seated in the stop Q′ the continued movement of the carriage I compresses the coiled spring S^2, abutting at one end against the flange of the sleeve S and at its opposite end against the flange of the fixed sleeve S′ upon the bar T. The stop-block Q is also suitably recessed and slotted to afford bearing for the horizontal trip-bar U, provided upon its under side with a projection U′, in which is formed a comparatively wide notch U^2, the bottom of which presents two oppositely-inclined bearings U^3 and U^4, adapted to bear upon the upper edges of the sway-bar P^5. The trip-bar U is also provided with two upwardly-projecting lugs U^5 and U^6. Just before the carriage I reaches the end of its excursion to the left the lug U^5 is carried into collision with the flange of the fixed sleeve S′, and the motion of the trip-bar U being thus arrested the inclined bearing U^3 forces the sway-bar P^5 down until it clears the stop Q′, whereupon the compressed spring S^2 expands and acting through the medium of the the lug R^3 drives the slide-bar R^2 to the right and thus shifts the sway-bar P^5 into the recess Q^2. This opens the clutch of shaft M′ and closes the clutch of the shaft N′, and thereby reverses the direction of the sliding carriage I.

At the corresponding point in the excursion of the carriage I to the right the lug R^4 is carried into collision with the corresponding sleeve T′ and compresses the spring T^2 until the lug U^6, by collision with the flange of the fixed sleeve T^3, arrests the further movement of the trip-bar U and thereby causes the inclined bearing U^4 to force the sway-bar downward out of the stop Q^2 and thereby free it to the action of the force stored up in the compressed spring T^2, whereby the sway-bar P^5 is reversed in position and seated again in the stop Q′. The trip-bar U is also provided at one end with a handle U^7, or, if desired, both ends of the trip-bar U may be provided with handles by means of which the trip-bar can be conveniently reciprocated and the sway-bar be thereby seated in either of the stops Q′ or Q^2 or be left at rest in its median position.

For abundant caution, in order to steady the parts in their movements the box-frame M^3 has secured to it a standard V, provided with a lateral perforation, through which the bar T extends, the stop-block Q being directly secured to the standard V and being thereby connected with the box-frame M^3.

The vertical feed mechanism of the rock-drill cylinder embraces the usual screw-bolt *a*, engaging a rotatable nut *a′*, journaled in a fixed bearing a^2, deriving its support from the bed-plate H. The nut *a′* is rotated in the usual way by means of the pair a^3 of miter-gears from the horizontal shaft *b*, journaled in the tubular bearing *c*, formed integrally with the bracket *c′*, which is fastened to the bed-plate H. The outer end of the shaft *b* has rigidly affixed to it a hub *b′*, from which there projects a pawl-carrying arm b^2, to which are pivoted two pawls b^3 and b^4. The pointed ends of the pawls, which are pressed toward each other by the springs b^5 and b^6, bear upon the opposite sides of the fixed wheel *d*, the periphery of which is provided with teeth *d′* and grooves d^2, which are rectangular in their cross-sections.

The opposed sides of the pawl-arms b^3 and b^4 are provided, respectively, with the shoulders b^7 and b^8, which project into the path of motion of the pin *e*, affixed to the hub *e′* of the hand-wheel e^2 and projecting laterally therefrom through a concentrically-curved slot in the pawl-carrying arm b^2. The hub *e′* of the hand-wheel e^2 is loosely mounted upon the hub *b′* of the pawl-carrying arm b^2 and is secured in position thereon by the washer e^3, on the outside of which is a nut e^4, screwed on the outer end of the shaft *b*. When it is desired to raise or lower the rock-drill cylinder, for example, when it becomes necessary to operate the feed by lowering the range of movement of the tool, the hand-wheel e^2 is rotated in the appropriate direction. During the initial movement of the wheel e^2 the pin *e* is moved into collision with one or the other of the shoulders b^7 or b^8 and thereby rocks one of the pawls b^3 or b^4, as the case may be, out of engagement with the teeth of the fixed wheel *d*. By further rotation of the hand-wheel e^2 the pin *e* is carried against the adjacent end of the slot in the pawl-carrying arm b^2 and thereafter communicates its own rotary motion to the pawl-carrying arm, and hence to the shaft *b*, while the pawl which has not been rocked rides over the teeth of the fixed wheel *d*. When the hand-wheel e^2 is released, the previously-disengaged pawl springs back against the fixed wheel *d*, which, being thus engaged by

both pawls, is thereby prevented from yielding to any influence such as might result from the jarring of the machine, tending to rotate it in either direction.

The mechanism for rotating the tool step by step when the machine is used for drilling holes consists of the usual spiral bar *f*, having affixed to its upper end the ratchet-wheel *f'*, contained within the usual pawl-chamber *f²*, provided with a multiplicity of pawls *f³ f³*, which are spring-pressed against the ratchet-wheel *f'*, and by preventing its rotation compel the piston to rotate during its stroke in one direction to the extent to which the piston compels the ratchet-wheel to rotate during its stroke in the opposite direction.

The device for rendering the rotary feed inoperative when the machine is to be used for channeling consists of a cam-shaped disk *g*, provided with notches *g'* in its periphery, which, when the disk is appropriately adjusted, permit the pawls *f³ f³* to spring into engagement with the teeth of the ratchet-wheel *f'*, as shown in Fig. 11. The disk *g* is affixed to the lower end of a shaft *g²*, extending upward through the cap of the pawl-chamber and having affixed to its outer end the radius-arm *g³*. A spring-latch *g⁴*, affixed to the arm *g³*, is adapted to be seated in appropriately-situated notches *g⁵*, formed in the boss *g⁶*, projecting upward from the cap of the pawl-chamber.

By swinging the arm *g³* in the appropriate direction and thus seating the latch *g⁴* in the appropriate notch in the boss *g⁶* the pawls *f³ f³* will be rocked outward and held clear of the ratchet-wheel *f'*, so that the ratchet-wheel *f'*, having been rotated in one direction by the upstroke of the piston, will simply be rotated in the opposite direction by the downstroke thereof, and hence no rotary motion will be imparted to the piston.

It is customary to employ for channeling a gang of tools or bits arranged side by side, and such an arrangement may of course be employed in the present machine. Even in an ordinary machine the employment of a gang of tools is subject to the objection that it is difficult to preserve them of uniform length, because they are apt to wear unequally, and that difficulty is much increased if the machine be run at the high rate of speed which is rendered attainable and permissible by the improvements herein described. To avoid this difficulty, the tool is made of a single flat bar *h*, provided with a multiplicity *h'* of cutting edges, which, being made of the same piece of steel, are likely not to wear unequally when in use.

The device for securing the horizontal members to the end members of the swinging frame is shown in section in Fig. 1 in connection with the horizontal member F and the end member E, on referring to which it will be seen that the end of the tubular member F is seated in the usual recess formed on the face of the end member E. A short bolt *i* extends through the end member E and is provided upon its screw-threaded outer end with the nut *i'*. The head *i²* of the bolt is seated within the yoke *j*, the end of which is perforated to admit the insertion through it of the shank *i³* of the bolt *i*. The yoke is introduced into the end of the tubular member F and its legs *j' j'* are perforated to allow the insertion through them of the barrel of the stud *k*, such insertion being permitted by apertures on opposite sides of the shell of the tubular member F. The said apertures are provided with slots extending toward the end of the tubular member F, and these slots are of just sufficient width to contain the trunnions *k' k'* of the stud *k*. The yoke being pulled outward, the trunnions are seated in the ends of the slots referred to and the tubular member is bound to the end member by screwing the nut *i'* upon the screw-threaded outer end of the bolt *i* home against the perforated boss *l*, cast on the outer side of the end member E.

What is claimed as the invention is—

1. In a bar-channeling machine, the combination, as herein set forth, of a main swinging frame; four supporting-legs for supporting said machine; four diagonal brace-rods connected with the lower part of said swinging frame; clamps upon said supporting-legs; sockets connected to said clamps and adapted to permit the extension through them of said diagonal brace-rods; means for adjustably fastening said clamps upon said legs, and means for adjustably securing said diagonal brace-rods in said sockets.

2. In a bar-channeling machine, the combination, as herein set forth, of diagonal brace-rods pivotally connected to the lower part of the main swinging frame, collars rotatable upon the supporting-legs of the machine, tubular sockets flaring at both ends and connected to said collars and adapted to permit the extension through them of said diagonal brace-rods, means for adjustably fastening said collars upon said legs and means for adjustably securing said diagonal brace-rods in said sockets.

3. A splash-plate, connected with the lower part of the sliding carriage upon which the operative parts of the apparatus are carried, for intercepting the splash from a channel in process of being cut.

4. A box for containing a tool-guide, the said box consisting of a rear member adapted for connection with the lower part of the rock-drill-cylinder bed-plate; a cap constituting the front member of said box; laterally-swinging latch-bolts pivoted to said bed-plate and adapted to enter notches in the sides of the said two members of said box, and nuts upon the outer ends of said latch-bolts, whereby when the said bolts are swung into said notches, and said nuts are screwed home upon

the face of said cap, the two members of said box are fastened together and the box is fastened to said bed-plate.

5. In a bar-channeling machine a piston-rod reciprocating in a right line and provided with a chuck for holding the channeling-tool or gang of tools, in combination with a guide loosely embracing the shank or shanks of the said tool or tools, preventing the rotation thereof, and presenting therefor guide-surfaces substantially parallel with a prolongation of the right line forming the center line of the bar of the actuating-cylinder for the purpose of dispensing with the cross-head commonly employed, and thereby lightening the reciprocating parts.

6. In a bar-channeling machine employing a reciprocating piston-rod provided with a chuck for holding the channeling-tool or gang of tools, the herein-described device for dispensing with the cross-head commonly used, the same consisting of a bodily laterally-yielding guide for loosely embracing the shank or shanks of the said tool or tools, and ways for defining the yielding of said guide in a path crosswise of the plane of the channel which is being cut.

7. A tool-guide for loosely embracing the shank or shanks of a channeling-tool, or gang of channeling-tools, in combination with a bearing, or box, composed of separate members with its side walls bearing with a loose sliding fit upon said guide, but with its front and rear walls so far distant as to afford said guide a prescribed range of forward-and-backward movement, and means for retaining said guide in the bearing afforded for it by said box.

8. In a bar-channeling machine a sliding carriage carrying rock-drilling apparatus, and mechanism for imparting lateral or horizontal feed movements thereto in relatively-opposite directions, said mechanism including a sway-bar for reversing the direction of said lateral feed movements, a stop-block intersecting the plane of swaying movement of the said sway-bar and presenting recesses serving as stops into which said sway-bar is adapted to seat itself; a slide-bar loosely connected with the end of the said sway-bar and a trip-bar for tripping said sway-bar out of the said recesses or stops and in combination with said sliding carriage and said mechanism; a horizontal rod secured to the frame of the machine; two spring-supported sleeves carried upon said rod and adapted to intersect prescribed parts of the path of movement of said slide-bar when said slide-bar is partaking of the movement of said sliding carriage; fixed collars upon said rod between said sleeves and the end of said rod and intersecting at prescribed points the path of movement of said trip-bar when said trip-bar is partaking of the movements of said carriage; expanding springs arranged between said fixed collars and said sleeves whereby at a prescribed stage in the lateral movement of the sliding carriage in either direction the said slide-bar is carried into collision with the sleeve in front of it and made to compress the spring which bears upon said sleeves until the said trip-bar is carried into collision with the fixed collar supporting said spring, and by such collision having been made to cease to partake of the sliding movement of the carriage, has operated to trip the said sway-bar out of the recess in which it was previously seated and has thus released the said slide-bar to the resilient operation of the previously-compressed spring by the force of which the said sway-bar is swayed into its opposite position and the feed mechanism is thereby reversed.

9. In a bar-channeling machine automatically-operating mechanism for reversing the lateral [feed of the rock-drilling apparatus, the said mechanism including independent motors mounted upon the frame of the machine and a clutch-shifter manually detachable from the mechanism which actuates it automatically, and manually movable from one of its extreme positions to the other for the purpose of reversing the automatic lateral feed movements, or movable into a median position in which it operates to break the continuity of the gearing by which motion is transmitted from a power-driven shaft to effect the lateral feeding of the rock-drilling apparatus, and a manually-operative hand-wheel for imparting lateral movement to the sliding carriage upon which the rock-drilling apparatus is carried, when the continuity of the said gearing is disestablished by the movement of the said clutch-shifter to its median position.

10. In a bar-channeling machine in which the rock-drilling apparatus is carried upon a carriage adapted to slide upon horizontal members of the frame of the machine, mechanism including independent motors mounted upon said frame for automatically imparting lateral or horizontal feed movements to said sliding carriage and for automatically reversing the direction of such movements in combination with mechanism, susceptible of being actuated manually for imparting lateral sliding movements to the said sliding carriage, and means for disestablishing the continuity of said automatically-operating feed mechanism.

11. In a bar-channeling machine, the combination as herein set forth of the down-feed hand-wheel loosely mounted upon a shaft geared to the vertical feed-screw, a pawl-carrying arm affixed to said shaft, a finger connected to said hand-wheel and intersecting the plane of motion of said arm, a fixed toothed wheel adjacent to said pawl-carrying arm, a pawl pivoted to said pawl-carrying arm and adapted to normally engage the teeth of said fixed wheel and thereby prevent any down-feeding motion of said feed-screw, a shoulder on said pawl intersecting the path of motion of said finger whereby when the

said hand-wheel is turned in the direction required for the down feed the said finger first trips the said pawl out of engagement with said toothed wheel and then communicates the rotary motion of the said hand-wheel to the said pawl-carrying arm and the said shaft.

12. In a bar-channeling machine employing mechanism for effecting a rotary feed of the piston, which mechanism includes the usual ratchet-wheel and spring-pawls for engaging the teeth of said ratchet-wheel, a manually-operative cam for throwing and holding said pawls out of engagement with said ratchet-wheel.

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