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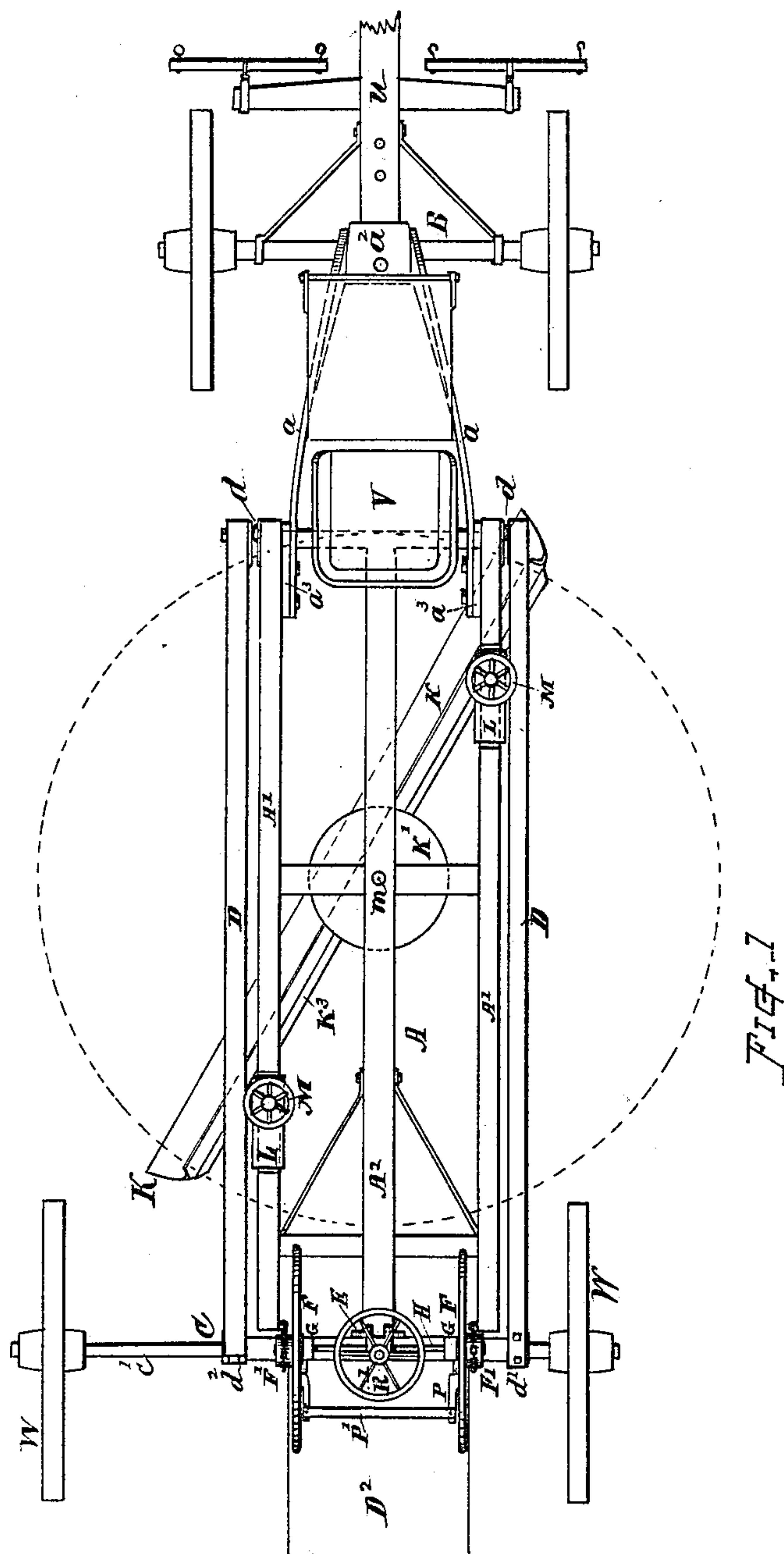
4 Sheets—Sheet 1.

G. W. TAFT.

MACHINE FOR MAKING, REPAIRING, AND CLEANING ROADS.

No. 362,679.

Patented May 10, 1887.



WITNESSES.

Ellas P. Blinn.
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(No Model.)

4 Sheets—Sheet 2.

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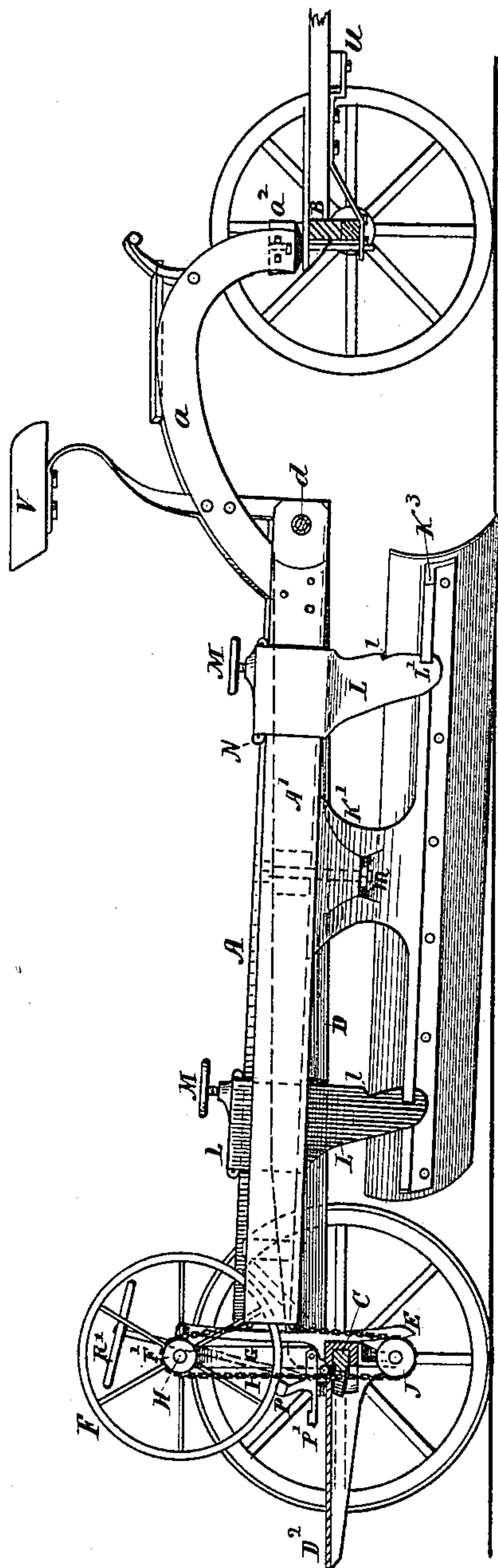


Fig. 2

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4 Sheets—Sheet 3.

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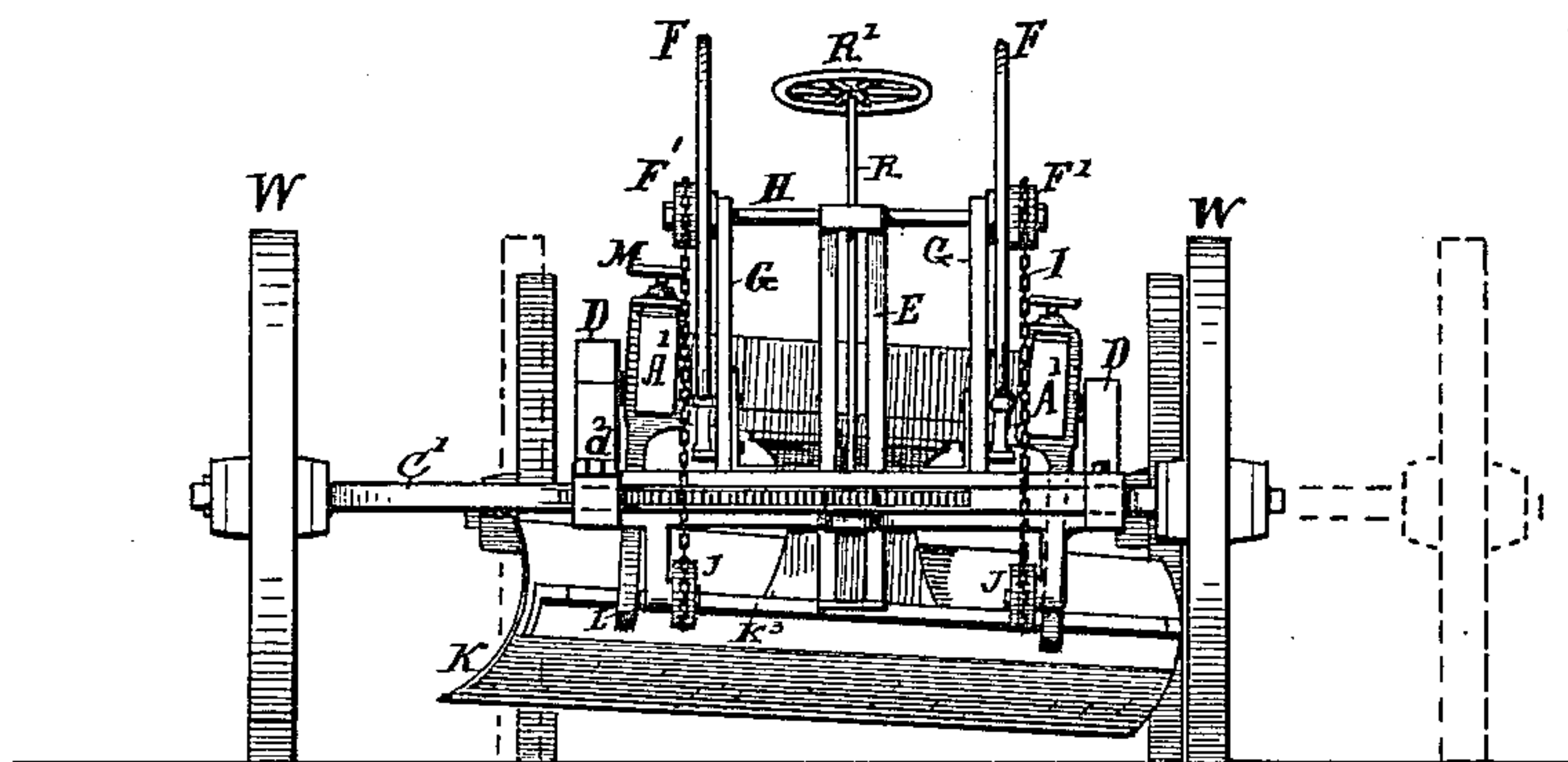


Fig. 3

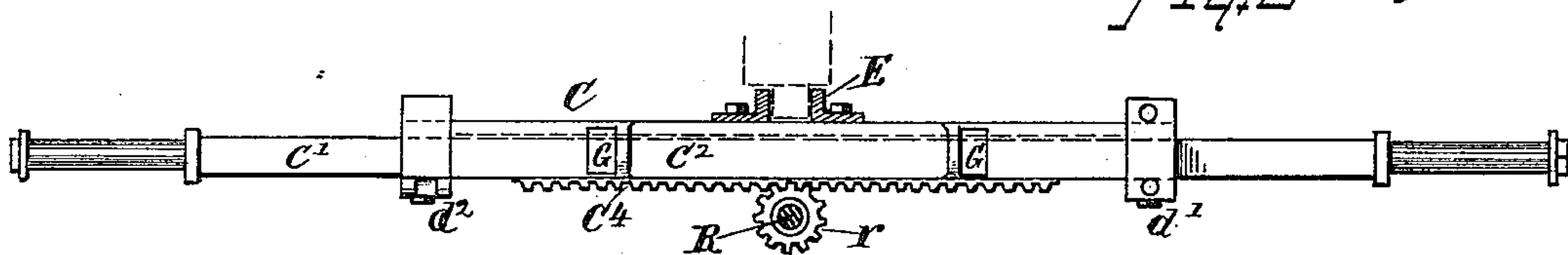
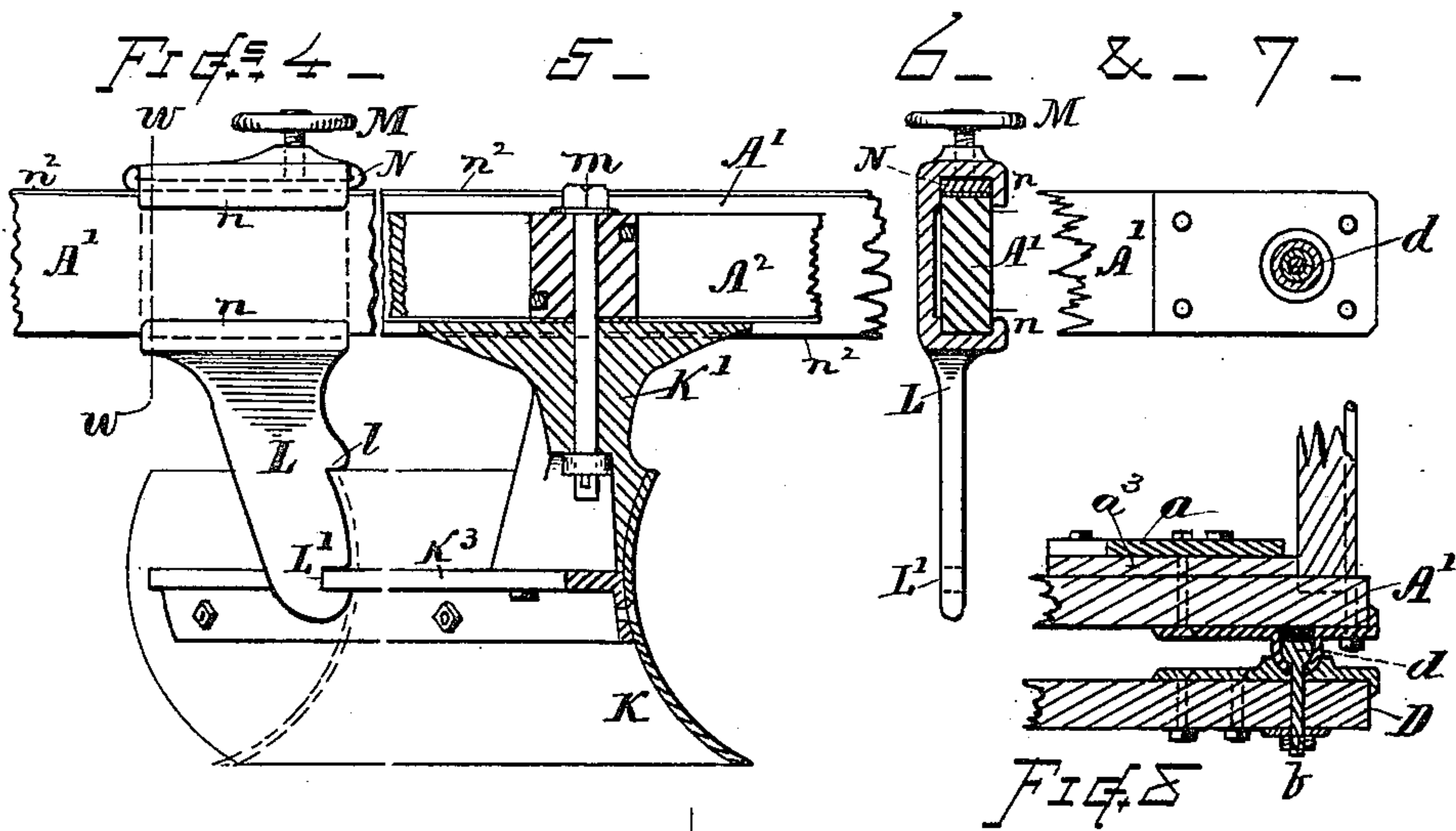


Fig 9

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(No Model.)

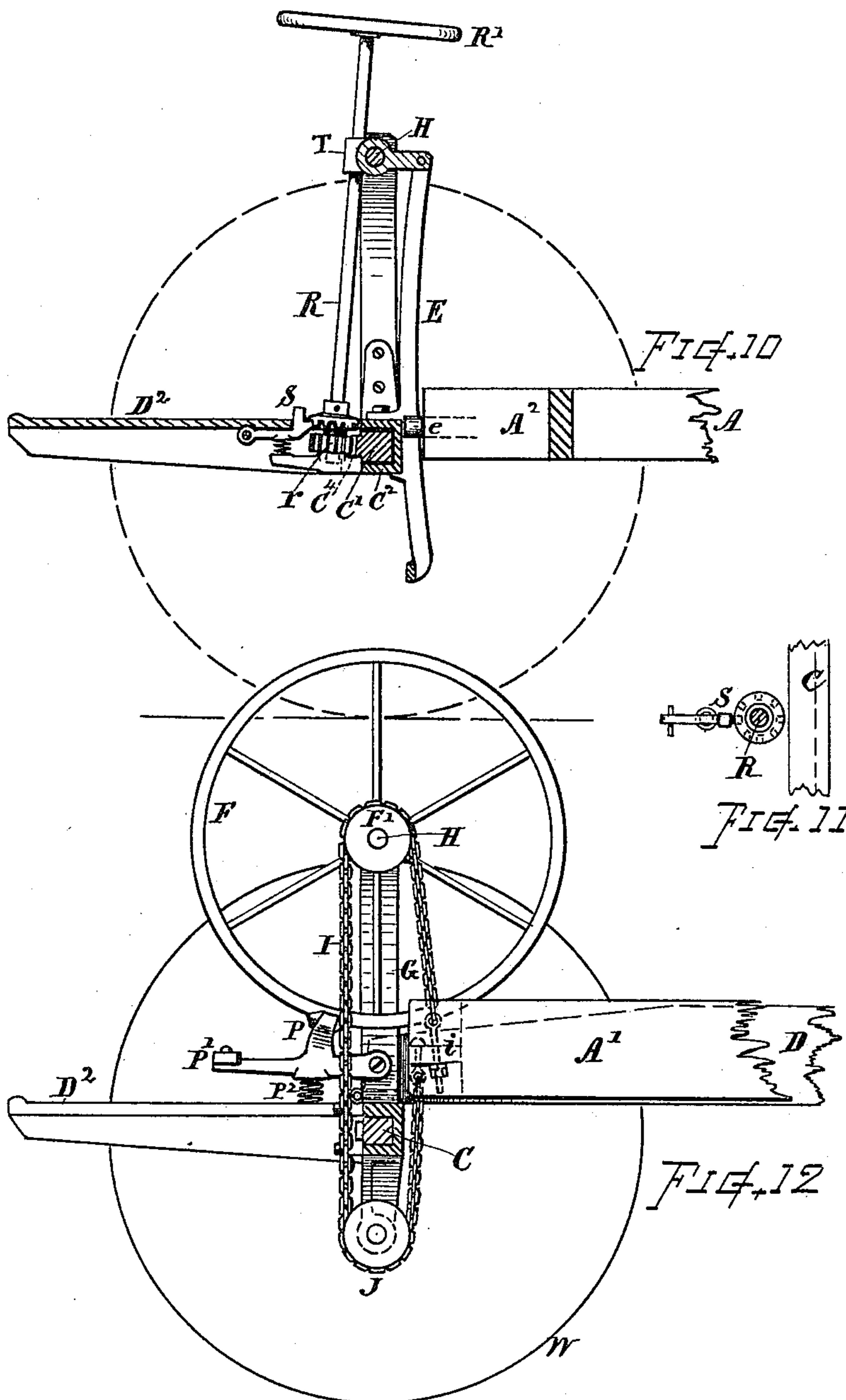
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WITNESSES.

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UNITED STATES PATENT OFFICE.

GEORGE W. TAFT, OF ABINGTON, CONNECTICUT.

MACHINE FOR MAKING, REPAIRING, AND CLEANING ROADS.

SPECIFICATION forming part of Letters Patent No. 362,679, dated May 10, 1887.

Application filed July 26, 1886. Serial No. 209,050. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. TAFT, a citizen of the United States, residing at Abington, (in the town of Pomfret,) county of Windham, and State of Connecticut, have invented certain new and useful Improvements in Machines for Making, Repairing, and Cleaning Roads, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

This invention relates to improvements in that class of road-working machines in which a diagonally-disposed scraper or plowing-blade is mounted in connection with a wheeled carriage or supporting-body, and provided with mechanism whereby the scraper can be adjusted to the different required working positions.

The objects of my present invention are to provide a simple and effective road-machine in which the body or frame which carries the scraper or blade can be elevated and depressed, or adjusted to inclined position in relation to the rear axle, in a quick, easy, and efficient manner; also, to afford a practical and convenient adjusting mechanism which can be readily controlled by the operator and securely retained at positions of adjustment; also, to provide a scraper or blade that can be set at any required position of oblique adjustment or swung completely around, so that the rear or backward curvature of the blade can be utilized for leveling purposes when desired; also, to provide side frames joining the body and axle, which will admit of upward, downward, and torsional adjustment of the scraper-supporting frame without cramping; also, to afford means for sustaining the ends of the blade in proper relation with the supporting-frame, and preventing rise and fall of the blade ends independent of its supporting-frame.

Another important object is to provide in a diagonal road-scraper or road-working machine a shifting rear axle, whereby the relation of the rear end of the body and the rear traveling wheels can be varied or changed to meet different conditions of work to be performed; also, to afford means whereby adjustment of the shifting rear axle can be effected and retained, as more fully hereinafter described.

These objects I attain by mechanism the nature, construction, and operation of which is illustrated in the accompanying drawings, and explained in the following description, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a plan view of a road-machine, illustrating the features of my present invention. Fig. 2 is an elevation view of the same with one side removed, the better to show the construction of operating parts. Fig. 3 is a rear view of the machine. Fig. 4 is an inner side view, on larger scale, of one of the adjustable blade-supporting standards. Fig. 5 is a vertical section through the central part of the blade swiveling block and body-frame. Fig. 6 is a transverse section of the side bar and standard at line *ww*, Fig. 4. Fig. 7 is a vertical section through the joint which connects the body-frame and side frame. Fig. 8 is a horizontal section through said joint and frames. Fig. 9 is a plan view of the shifting axle and its gear. Fig. 10 is a vertical section of the rear axle, showing the axle-adjusting mechanism and body-frame guide. Fig. 11 is a detail view of the locking mechanism for the axle-shifting gear; and Fig. 12 is a vertical section through the rear axle, showing the adjusting mechanism for controlling the body and blade.

Referring to parts, A denotes the body-frame, composed preferably of parallel guide-pieces A' and a center bar, A², connected together transversely by means of front, rear, and center transoms properly framed, bolted, and braced together, so as to make a suitably-rigid body, and having at the forward ends goose-necks, arch-irons, or extensions *a*, that connect with the pintle block or bearer *a*², which is supported by the front axle, B, and connected thereto by a suitable pintle or king-bolt in a manner to permit swivel and rocking action. The rear end of the body A terminates forward of the rear axle, C, so that its rear end can be raised above or depressed below the level of said axle without interfering therewith.

D D indicate side frames or reach-bars arranged at a short distance outside the guide-pieces A'. The forward ends of the reach-bars are attached to the body at *d* by universally-hinging joints or connections that admit of free action in all directions, while the rear

ends of said reach-bars are joined to the rear axle, C, or its casing—one by rigid connections at d' and the other by a hinge-connection, as at d'' —thereby permitting of the forward ends of said reach-bars taking a different level without strain on the connecting-joints.

The hinge-joint is preferably constructed, as shown in Figs. 7 and 8, by means of two plates or castings, one of which is provided with a spherical boss or projection and the other with a socket for receiving said boss, said plates being respectively secured to the bars A' and D, and the parts held together by a round-headed bolt, b , passing through them, substantially in the manner indicated in Fig. 8.

Upright guides E are arranged at the front of the rear axle, C, and the rear end of the center bar, A^2 , of the body-frame is embraced by said guides, whereby the body-frame A is confined centrally in relation to the rear ends of the reach-bars D, while permitted free upward, downward, and rocking action. The end of the bar A^2 is preferably furnished with a stud, anti-friction roll, or equivalent device, e , for fitting between the guides, as indicated in Fig. 10.

F F indicate hand-wheels mounted above the rear axle, and carried by suitable standards, G, in connection with said axle. A shaft, H, preferably extends across said standards, on the ends of which shaft the hand-wheels rotate. A sprocket or sheave wheel, F' , is formed on or attached to the hub of each of the hand-wheels, and a chain or band, I, extends around said sprocket and also around a guiding sheave, J, supported beneath the axle, and connects with the rear end of the guide-bar A' of the body-frame from above and below in the manner illustrated, (see Figs. 2 and 12,) the rear angles of the body-frame being thus connected to the right and left hand wheels, respectively. I prefer to employ suitable connecting devices, whereby slack or looseness of the chain I can be taken up, as at i in Fig. 12.

A platform, D^2 , extends rearward from the axle C, upon which the operator stands to control the scraper-adjusting mechanism. A brake or stop-lever, P, is combined with each hand-wheel to retain it at any desired position. Said brake may work by frictional contact or be fitted to catch into notches for locking or retaining the parts, as desired. A spring, P^2 , forces the brake into contact with the wheel, and a pedal, P' , is provided for enabling the operator to release the stop or brake by pressure of his foot. (See Fig. 12.)

K indicates the scraper bar or blade, preferably of a curved plate of steel, though other forms may in some instances be used, if desired. Said blade is centrally supported on a plate or pintle-brace, K' , and pivoted to the body or plate by a bolt, m , or otherwise, in such manner that the blade can swing horizontally to different positions of right or left adjustment. I prefer, as in the present in-

stance, to make it capable of swinging in a complete circle about its axis or pivotal center, so that the blade can be not only adjusted for diagonal plowing action, but also completely reversed, so that the under curve of the back of the blade can be used for leveling purposes, when desired. The center plate or pintle support, K' , to which the blade is attached, is made of such height that the blade is some distance below the level of the body-timbers A' , thus allowing of the body at its rear end to be raised considerably above the reach-bars D without bringing the top of the blade in contact therewith. A re-enforce bar is fixed upon the back of the blade, having a backward-projecting flange, K^3 , extending longitudinally of the blade and parallel with the edges thereof.

L L denote adjustable standards for sustaining the ends of the blade. Said standards are mounted to slide upon the side timbers of the body-frame A, which serve as guides therefor, and are provided with lips n , which lock over the angle of the bar, as indicated in Figs. 4 and 6, and are furnished with clamping devices, as cams or screws M, whereby they can be rigidly set at any desired position.

The lower portion of the standard is provided with a notch or recess, L' , that embraces the flange K^3 on the back of the blade, and thus while the standard sustains the blade against backward thrust, it also retains it rigidly against any upward or downward movement, independent of that imparted thereto by the raising or lowering of the side piece of the body-frame.

The standard L is preferably formed with a shoulder, as at l , to engage and support the edge of the blade when it is worked in reversed position for leveling. (See dotted lines, Fig. 4.)

The standards L can be moved back and forth along the guide-bars A' and clamped at any position for retaining adjustment of the scraper at any oblique or transverse position; or said standards may be moved back, so that the end of the blade can swing past them to reverse the position of the scraper. The head of the standard L is provided with a bearing-shoe, N, which rests upon the timber or guide-bar A' , and the clamping device or screw M acts against said shoe instead of directly against the bar, thus distributing the pressure of the clamp over a broad surface and avoiding abrasion of the bar. The shoe is preferably rounded upward at the ends, so as to slide easily on the bar. In some instances, if desired, the bars A' can be faced with metal plates n^2 , to protect the surfaces. The adjustable standard, having facilities for holding the blade to prevent upward or downward springing movement, is a feature of my invention.

The transoms between the bars A' are made somewhat narrower than said bars, so as to allow the overhanging lips n of the standard-castings to pass them without interfering therewith; or, if preferred, the bar A' may be rab-

beted or grooved out to give space for the lips n^2 along the edge thereof. When the bars A' are not rabbeted, blockings or pieces a^3 of less width than the bar A' and of a thickness somewhat greater than the lips n are introduced between the rear ends of the goose-necks or arch-irons and the sides of the frame where they attach together, so that said goose-neck will not interfere with the standard L being moved to the forward end of the side bar, A' , for supporting the forward end of the blade at a position of extreme angular adjustment.

Another feature of my invention which I deem of much importance in connection with diagonal road-machines is the construction and arrangement of the rear axle in a manner to permit lateral adjustment of the rear wheels in relation to the rear end of the supporting-carriage on which the scraper or blade is mounted. The axle proper or bar, C' , on the ends of which are the wheels W , is made of more than the usual length, and is preferably a rectangular bar of steel or iron, which is supported within an outer casing or box, C^2 , preferably of cast-iron, to which the frame or carriage-body is attached, the part C' passing through and being longitudinally movable within the part C^2 to an extent of about two feet, more or less. In connection therewith I provide means whereby the shifting of the axle within the supporting-casing can be effected. In the present instance, as shown in Figs. 9 and 10, the axle C' is provided with a rack, C^4 , which meshes with a pinion, r , on the lower end of a shaft, R , which extends up through the platform, and is provided at its upper end with a hand-wheel, R' , or means whereby the shaft can be conveniently rotated by the operator.

The operating mechanism is provided with a catch-dog or locking device, S , for holding the parts at positions of adjustment, said lock being arranged so that the operator can, with his foot, throw it out of gear for releasing the parts when he desires.

The upper part of the shaft R is preferably supported by a bearing, T , connecting the upper ends of the guides E and shaft H . A chain and sprocket may be used in place of rack C^4 and pinion r , if desired.

The advantages incident to the shifting hind axle are as follows: It in a great measure overcomes rocking action of the body of the machine as the wheels pass over uneven ground. It also permits of the rear wheel being set over, as indicated by dotted lines, Fig. 3, so as to brace against the bank when plowing the second round, or when moving the earth turned up by the first furrow from the shoulder of the road farther in toward the center of the road. It also allows an adjustment of the wheels, so that the windrow of earth can be deposited inside the line of the wheel when desired, so that the wheel can get support against the windrow. It also allows adjustment to avoid chopping action of the blade, by reason

of the wheels running over clods when the machine is cutting deep, as well as facilitating changes in the relative position of the rear wheels and carriage-body, to meet or correspond with different positions of angular adjustment of the scraper.

The feature of a longitudinally-shifting rear axle may be applied to wheeled scrapers or road-machines having a diagonal scraper-blade in which the blade-adjusting mechanism is of other construction than that herein shown—as, for instance, such as described in Letters Patent heretofore granted me—and I so intend to employ it and include such use as within the scope of my invention.

In the operation of my improved road-machine the scraper bar or blade K is adjusted to the required degree of oblique inclination or transversely to the direction of draft before starting the machine, such adjustment being effected and the scraper fixed at adjusted position by swinging the scraper on its central pivot, m , and sliding the standards or brackets L along the bars A' until they rest against the respective arms or wings of the blade, where they are rigidly fixed by turning down the screws M or clamping the standards to the bars. The scraper is thus sustained against backward strains, and is also held from upward or downward action (except as is imparted by movement of the frame A) by the grip of the recess L' upon the flange K^3 . The operator takes his position upon the platform D^2 and the driver upon the seat V , the team being attached to the pole and draw-bar U in the usual way, and as the machine is drawn forward the earth is rolled or plowed to one side by the diagonal scraper or blade K in the usual manner with machines of this class. As the machine moves forward, the operator controls the depth of cutting and dip of the blade by raising and depressing the rear corners of the frame, by the aid of the hand-wheels F and their connecting-chains I , in a very easy and convenient manner, the construction and arrangement being such that he has the most perfect and complete control of the blade by the hand-wheels. The frame A , being terminated forward of the rear axle, can be raised above or depressed below said axle, giving a great range of vertical movement, or one corner may be raised above the level of the axle and the other corner depressed below it, the forward end of the body or block a^2 rolling freely at its connection with the forward axle, and the frame being retained central by the guide E , thus giving a much more extended range of rocking action to the body A and dip to the blade than could be attained if the body extended past said axle, while the ball-joint hinging of the reach-bars to the frame at d allows perfect freedom of movement while giving the requisite stability and strength of construction.

For shifting the rear axle or changing the relation of the rear end of the carriage in re-

gard to the rear traveling-wheels, the operator throws off the lock S with his foot, and then, by taking hold of the hand-wheel R', rotates the shaft R and pinion r to the right or left, moving the axle-bar C' in respect to the axle-casing C² as desired.

I am aware that a road-scraper having a longitudinally-adjustable front axle has heretofore been made, and I do not therefore herein claim an adjustable front axle. The adjustable front axle is an essentially different thing from the adjustable rear axle or construction herein described, as none of the advantages above enumerated are attained by or incident to the front-axle adjustment, but are wholly dependent on the adjustment at the rear axle.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. In a road-machine, the combination, with the carrying axles and wheels and a diagonal scraper-blade, of a blade-supporting frame provided with side bars extending over and supporting the respective arms of the scraper and having its forward end supported in connection with and to rock upon the forward axle, its rear end terminating at a position forward of the rear axle and sustained therefrom by lifting devices supported on said rear axle and connected with said frame, substantially as described, whereby its rear end can be raised or depressed past said rear axle and laterally rocked to different degrees of inclination, for the purposes set forth.

2. In a road-machine, the combination of a body-frame having its forward end supported in connection with the front axle and its rear end terminating at a position in front of the rear axle, the scraper bar or blade pivoted to said frame, reach-bars connecting the sides of said frame with the rear axle, and means for elevating and depressing the rear corners of said frame, for the purpose set forth.

3. The combination of the body-frame having its forward end supported in connection with the front axle and its rear end terminating at a position in front of the rear axle, the scraper-blade pivoted to said frame for diagonal adjustment, and reach-bars extending from the forward part of said frame to the rear axle, their forward ends connected to said body-frame by loose or universal hinging-joints, and their rear ends secured to the rear axle, one of them rigidly and the other by a hinge, substantially as and for the purpose set forth.

4. In a wheeled road-machine, the combination of a rocking body-frame on which the scraper is suspended, supported at its forward end in connection with the front axle and wheels, its rear end terminating at a point in front of the rear axle, and connected with the rear axle by reach-bars, which permit torsional movement or rocking action of said scraper-supporting frame, mechanism for independently raising and depressing the rear corners of said frame, and a guide for maintaining its rear end central in relation to the

reach-bars and operating mechanism, substantially as set forth.

5. In a wheeled road-machine, the combination of a body-frame to which the scraper bar or blade is attached, having its front end supported in connection with the front axle and wheels, its rear end terminating forward of the rear axle, reach-bars connecting the rear axle and forward part of said frame by a flexible or hinge attachment, and an operator's platform, as at D², fixed to and extending back from said rear axle, with the controlling apparatus for adjusting the supporting-frame and scraper arranged in relation to said platform, substantially as shown and described.

6. The combination, in a wheeled road-machine, of the diagonally-adjustable scraper bar or blade, a rocking supporting-frame to which said blade is pivoted, adjustable brackets or standards adapted for sustaining the scraper at positions of adjustment rigidly in relation to said frame, hand-wheels and sprockets connected with the rear angles of said frame for independently raising and depressing the respective sides thereof, a guide for retaining said frame at a central position in relation to the hand-wheels and operating devices, and reach-bars connecting the forward part of said frame with the rear axle upon which the hand-wheels and operating devices are mounted, substantially as set forth.

7. In a diagonal road-machine, a scraper bar or blade pivotally connected with a supporting body or frame mounted on wheels and adapted to be completely reversed to bring the back of the scraper to the front, combined with sliding standards adjustable along the side bars of said frame for supporting the scraper at positions of diagonal adjustment and adapted for sustaining the sides of the scraper against vertical springing action, substantially as set forth.

8. The combination, with a body-frame having a scraper bar or blade suspended therefrom in the manner described, provided with means for sustaining said scraper at positions of oblique adjustment, of arch-irons or gooseneck extension fixed to the front end of said frame and connected to a rocker or pintle-block resting upon and pivoted to the front axle, hand-wheels supported upon the rear axle, and connecting-gear operated by said hand-wheels for elevating, depressing, or rocking said frame and scraper, for the purpose set forth.

9. The combination, with the body-frame having the sides or guide-bars, as A', and the scraper bar or blade centrally pivoted to said frame, of the adjusting-standards provided with sliding shoes or bearing-plates N, resting on said guide-bars, and means for clamping said standards at positions of adjustment by forcing said shoes against the surface of the guide-bar, as set forth.

10. The combination, with the body-frame and scraper-blade, of the center plate or brace,

K', supporting the center pivot, whereby the scraper and body are connected, and sustaining said scraper-blade at a distance below the level of the body-frame, substantially as set forth.

11. The combination, with the body-frame having guide-bars A' and the scraper bar or blade provided with a backwardly-extending re-enforce or flange, and centrally pivoted in connection with said frame, of the adjusting brackets or standards L, mounted on said side bars, having a recess, as L', near their lower ends, adapted to engage with said flange or re-enforce at the back of the blade and retain it from upward or downward movement, substantially as and for the purpose set forth.

12. The combination, with the body-frame A and the scraper blade, of the center plate or brace, K', supporting said blade at the pin-tle-bolt, and the adjustable brackets or standards L, supporting the ends or wings of said scraper, substantially as set forth.

13. In a machine for working roads, the combination of a carriage or body-frame supported on front and rear traveling wheels, a diagonally-disposed scraper-blade extending across and supported beneath said body-frame, and an extended longitudinally-adjustable rear axle, whereby one of the rear traveling wheels can be projected laterally beyond the working-line of said diagonal scraper-blade, for the purpose set forth.

14. In a machine for working roads, the combination of a carriage or body-frame supported on front and rear traveling wheels, a diagonally-reversible scraper-blade suspended beneath said body-frame, a longitudinally-adjustable rear axle-tree, and means for effecting adjustment of said scraper and axle to the right or left working positions, substantially as and for the purpose set forth.

15. In a road-grading machine, the combination of the long axle-bar C', having the wheels W mounted upon its outer ends, and the outer bar or shell, C², having bearings in which said axle-bar is supported and longitudinally adjustable, and provided with seats and projections for attachment to the reach-bars and carrying-standards, substantially as and for the purpose set forth.

16. In a road-grading machine, the combination, with the body-frame or carriage and a diagonally-operating scraper mounted on or suspended therefrom, of the rear axle consisting of the outer supporting-bar, C², attached to said carriage or frame, and the longer axle-bar, C', longitudinally adjustable thereon and provided with the toothed rack C⁴, the pinion

r, shaft R, and hand-wheel R', substantially as and for the purpose set forth.

17. The combination of the outer axle, C², the longer axle-bar, C', longitudinally adjustable therewith and provided with the rack C⁴, the operating-shaft R, the pinion r, and the locking-dog S, substantially as and for the purposes set forth.

18. The combination, with the body-frame having side bars, A', the scraper bar or blade suspended therefrom in the manner described, and the sliding standards or brackets for sustaining said scraper at positions of oblique adjustment, embracing and sliding upon the side bars in the manner set forth, of the arch-irons or goose-neck extensions connected to said frame, with a rabbeted bar or intermediate blocking, a³, of less depth than the frame to permit the lips of said brackets to pass the foot of the arch-irons, substantially as set forth.

19. The adjusting-standard L, having its head fitted with lips to embrace the side timber, A', of the body-frame, its lower part furnished with a recess, L', and shoulder l to engage with the blade, and its head provided with a clamp device, combined with the scraper-bar and scraper-supporting frame, substantially as and for the purpose set forth.

20. The combination, with the side bar, A', of the body-frame and the forward end of the reach-bar D, of the ball-and-socket connecting-joint, as at d, substantially as shown and described.

21. The combination, with the rear axle and rocking frame supporting the scraper-blade, of the centering-guide E, the hand-wheel F, having the sprocket F' attached to or formed on the hub thereof, the guide-sheave J, the chain or band I, and the take-up connection i, substantially as shown, and for the purpose set forth.

22. The hand-wheel F, having the sprocket F' supported above the rear axle, the guide-sheave J, supported beneath the rear axle, the chain I, passing around said wheels and attached to the vertically-moving rear end of the scraper-supporting frame, and the spring brake or stop device P, acting to arrest the motion of said wheel, as herein shown and described.

Witness my hand this 22d day of July, A. D. 1886.

GEORGE W. TAFT.

Witnesses:

CHAS. H. BURLEIGH,
ELLA P. BLENUS.