

No. 740,430.

PATENTED OCT. 6, 1903.

W. A. HEUSNER, C. H. DUDLEY & D. E. GRAVES.

ROAD MACHINE.

APPLICATION FILED JAN. 31, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

FIG. 1.

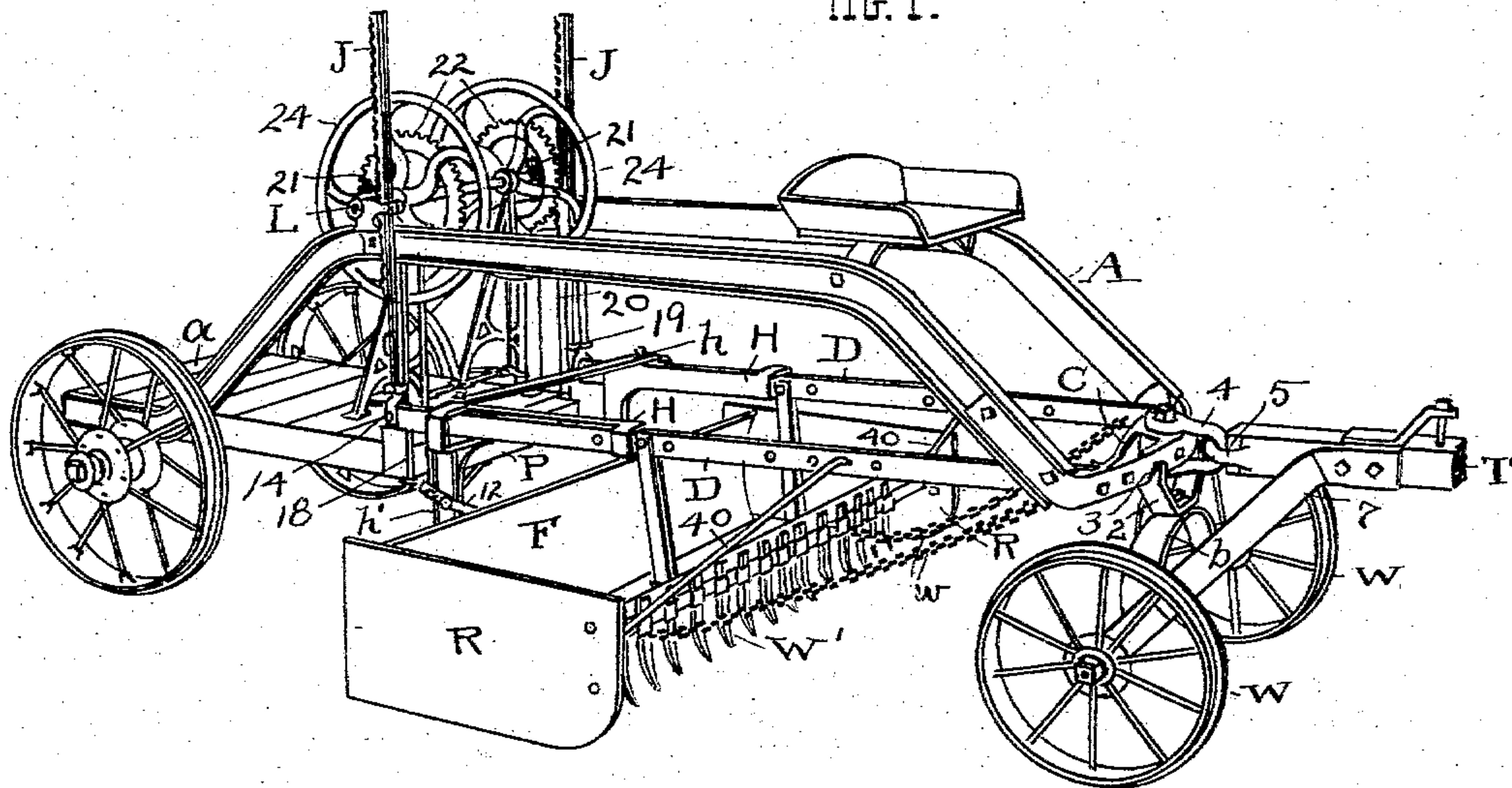


FIG. 2.

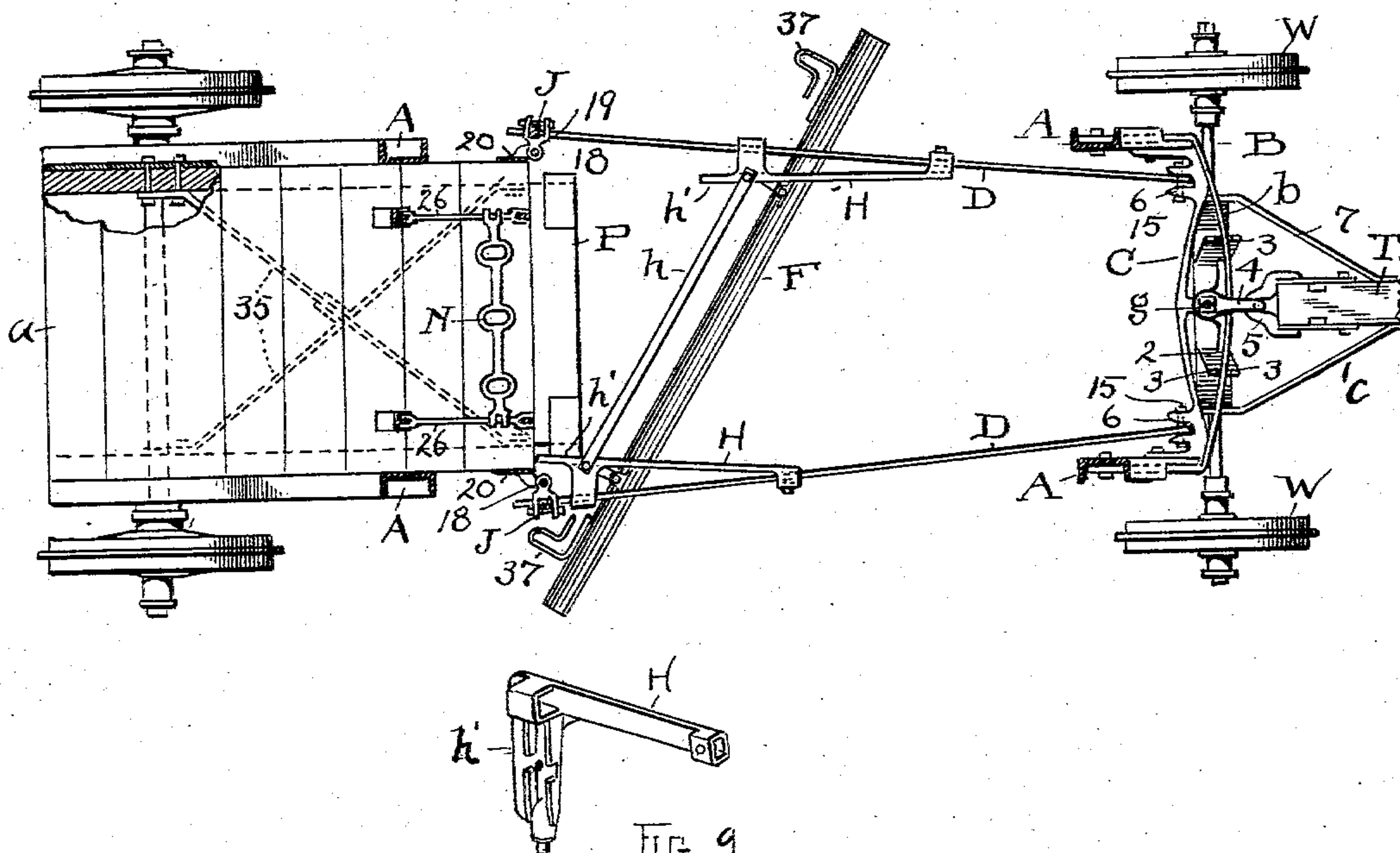


FIG. 9.

ATTEST.

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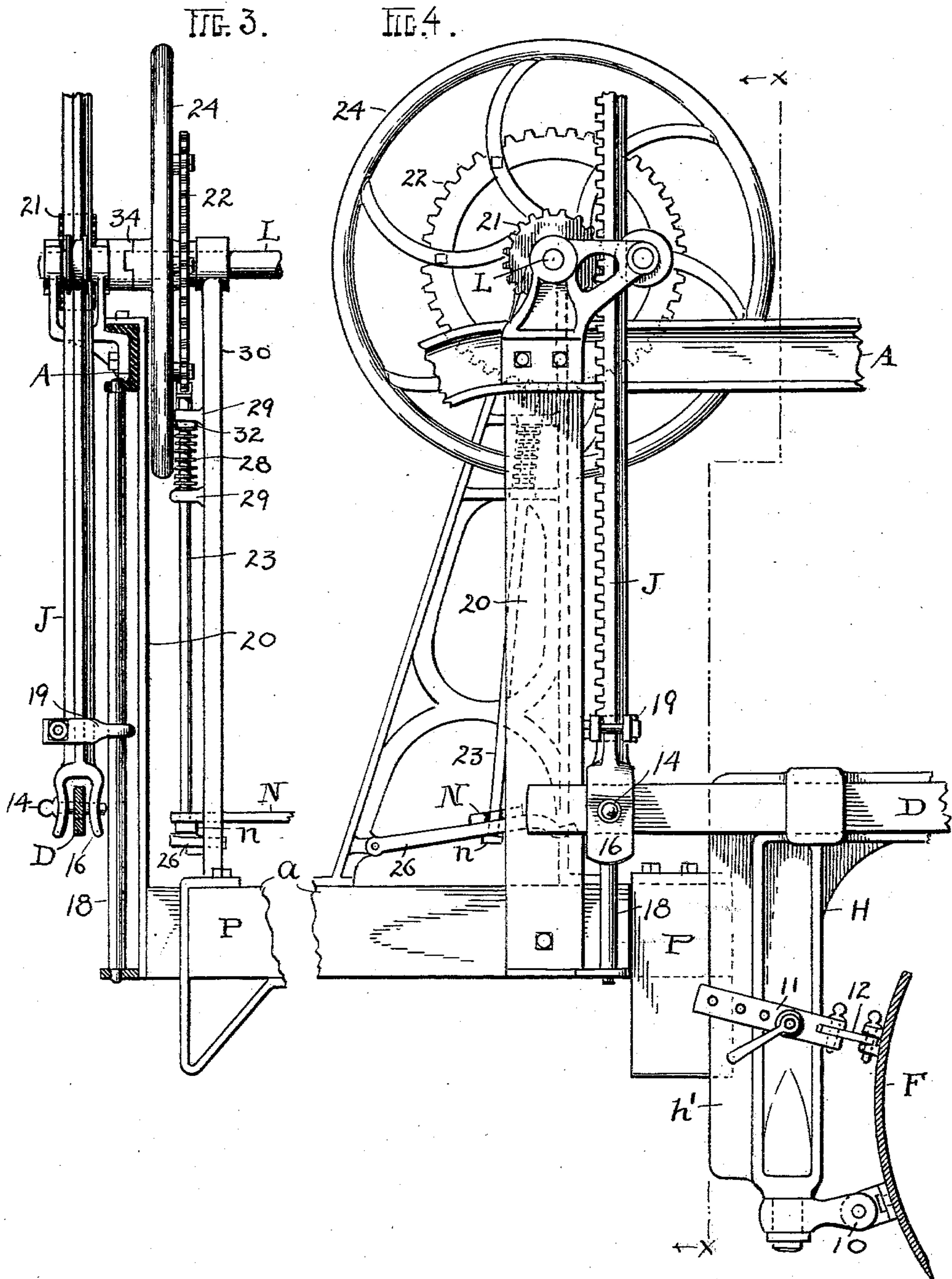
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3 SHEETS—SHEET 2.



ATTEST.

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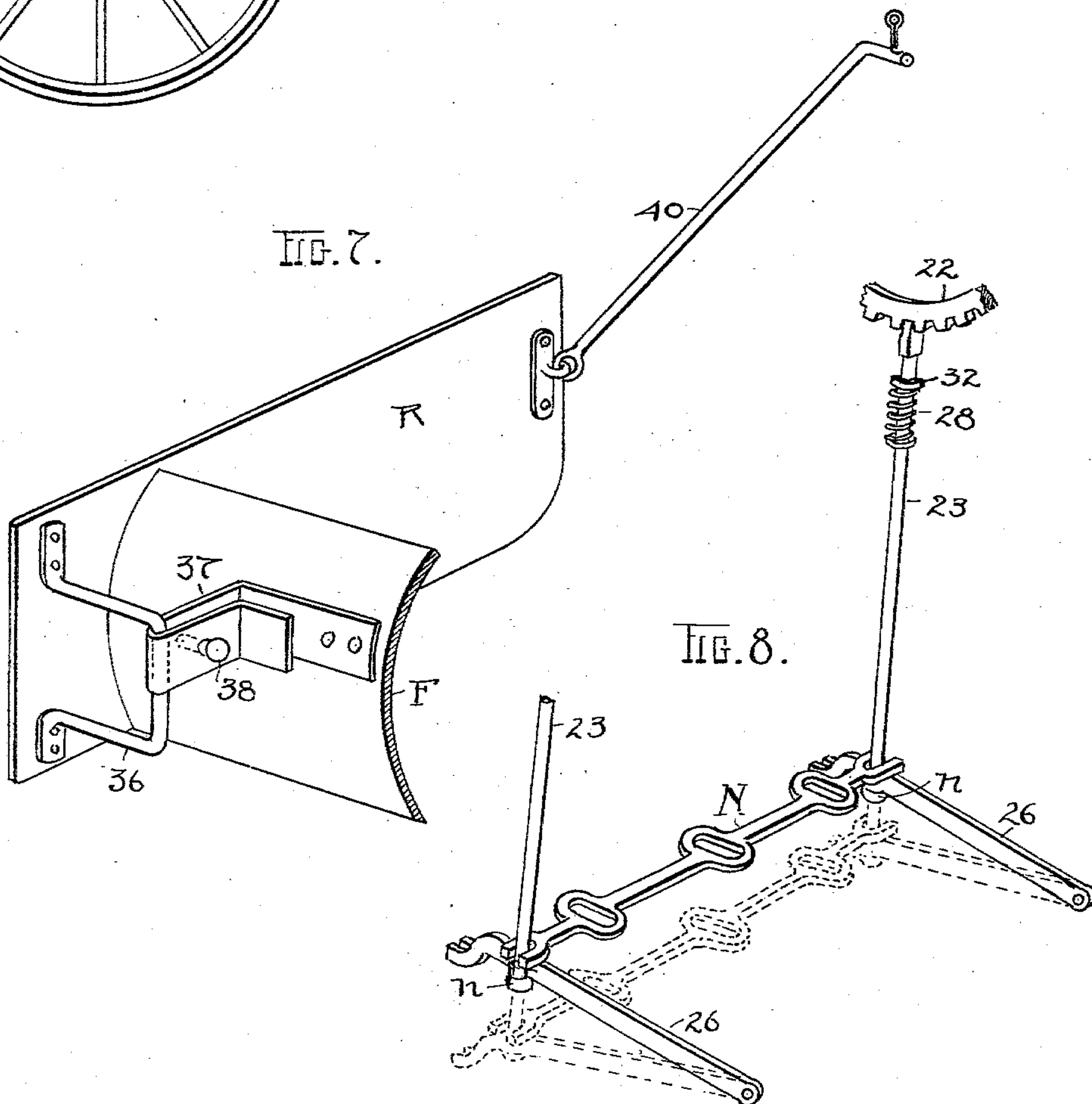
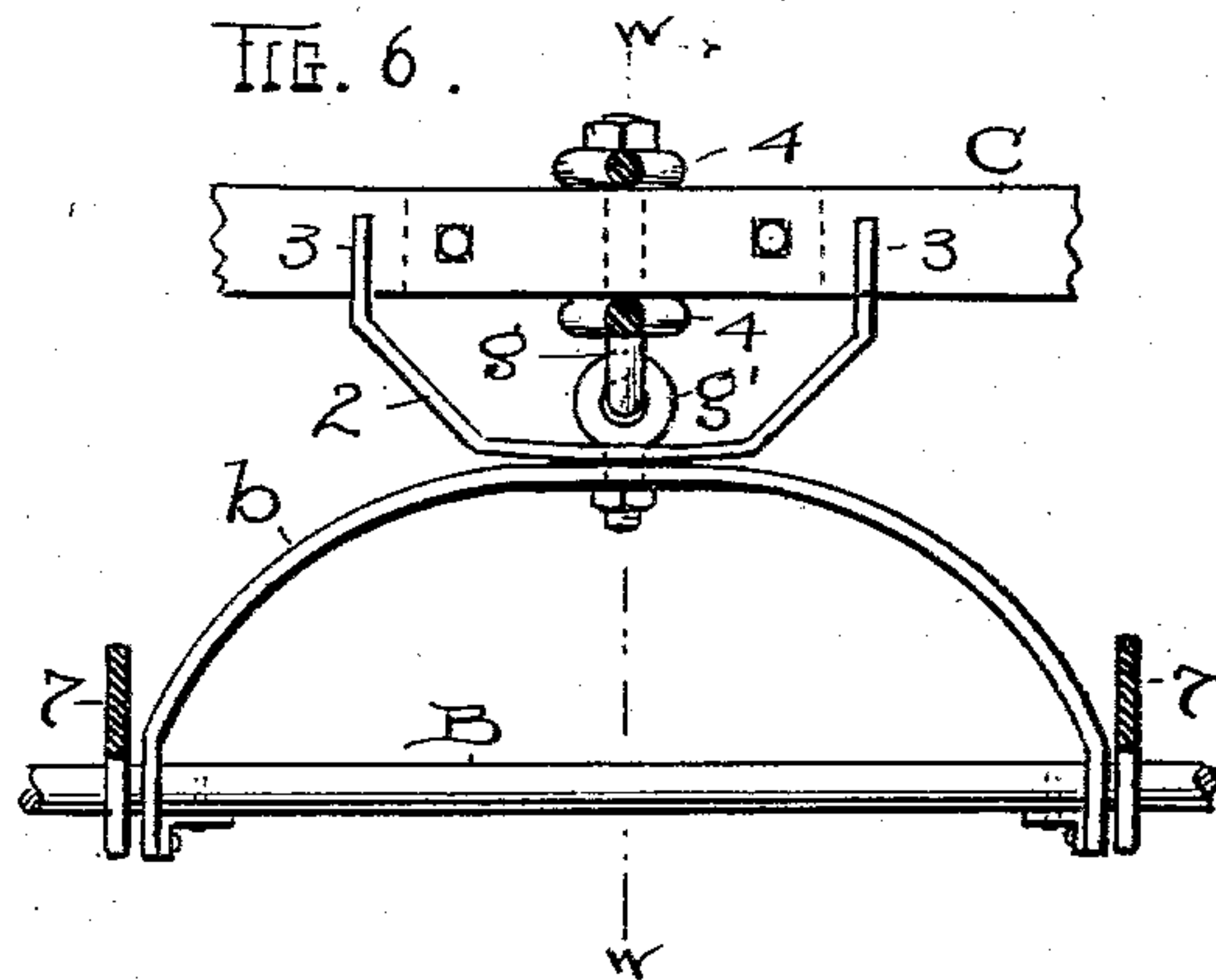
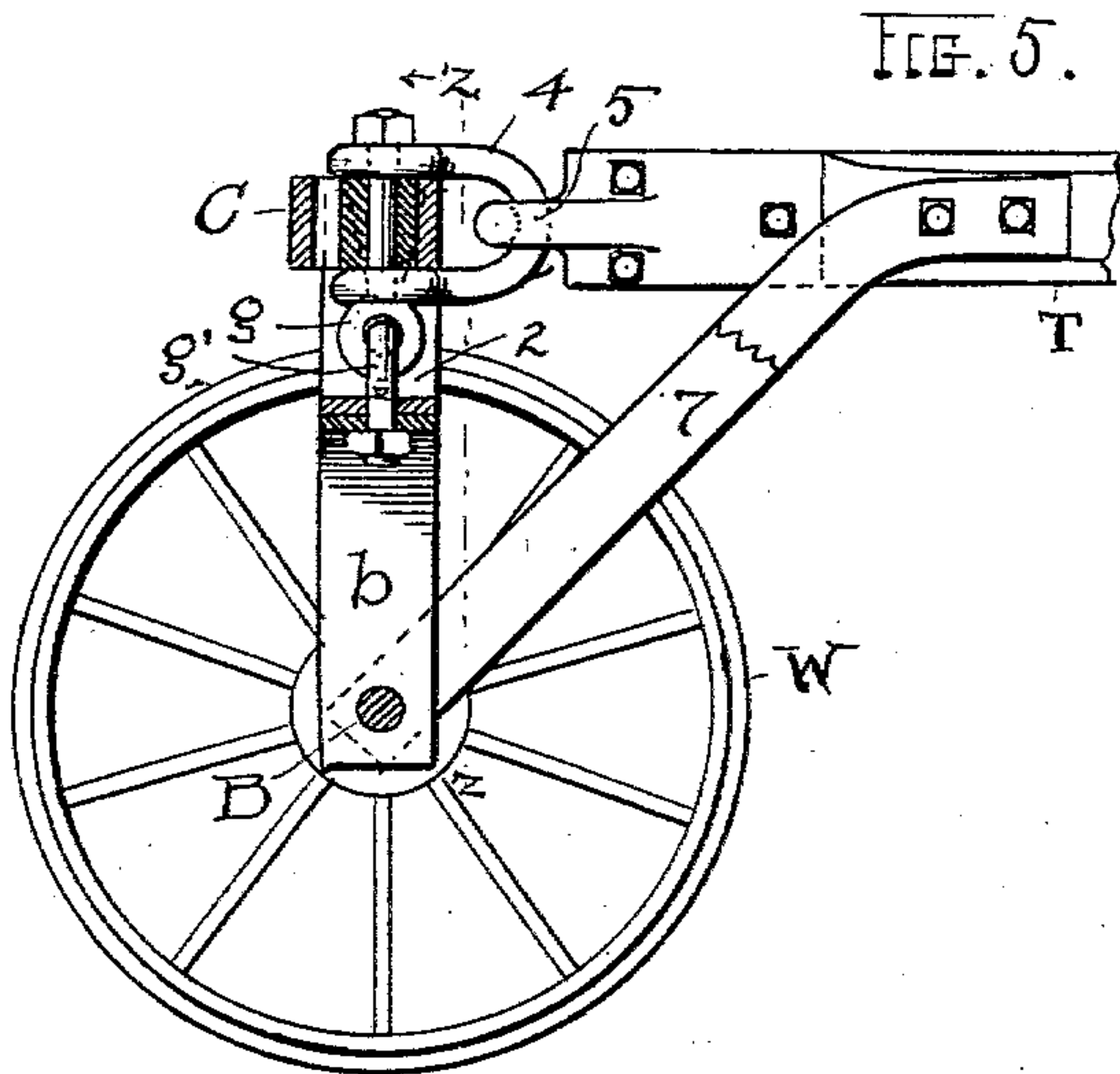
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ROAD MACHINE.

APPLICATION FILED JAN. 31, 1903.

NO MODEL.

3 SHEETS—SHEET 3.



ATTEST.

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UNITED STATES PATENT OFFICE.

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ROAD-MACHINE.

SPECIFICATION forming part of Letters Patent No. 740,430, dated October 6, 1903.

Application filed January 31, 1903. Serial No. 141,328. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. HEUSNER, CARL H. DUDLEY, and DAVID E. GRAVES, citizens of the United States, residing at Oberlin, in the county of Lorain and State of Ohio, have invented new and useful Improvements in Road-Machines; and we do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in a road-machine adapted to serve in turn as a grader, scraper, leveler, and spreader; and the invention consists in a machine having the construction and embodying the features and improvements substantially as herein shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective elevation of our improved machine, and Fig. 2 is a plan view thereof with the main frame and certain parts above the draft-bars removed. Fig. 3 is an enlarged sectional elevation of a portion of the machine on the line $x x$, Fig. 4, looking to the rear. Fig. 4 is an enlarged side elevation of the rear portion of the machine with the blade in cross-section and the fender removed. Fig. 5 is a vertical sectional elevation of the front portion of the machine, including the draft mechanism, and on a line corresponding to $w w$, Fig. 6. Fig. 6 is a front elevation of the mechanism shown in Fig. 5 and taken on a line corresponding to $z z$ on said figure, but with the wheels removed and the axle broken away. Fig. 7 is a perspective view of one end of the scraper-blade and one of the fenders and showing the means by which the fender and blade are connected. Fig. 8 is a perspective view of the foot-bar for controlling the detents engaging the rack-controlling shaft through intervening toothed wheels, as hereinafter fully described. Fig. 9 is a perspective view of one of the drag-bars, as hereinafter fully described.

In the machine thus shown we employ front and rear carriages or trucks connected by something of a truss-shaped frame A, which is raised centrally between its ends to afford

room beneath for all the necessary operations and adjustments of the parts, which require room to work at different elevations. A suitable working platform a for the operator is erected upon the rear carriage, and an arched bolster b is supported on the front axle B and is rigid therewith. Another and shorter bolster 2 is supported upon the said arch b and has fingers or end projections 3 on opposite sides at its ends between which the main frame A is loosely seated, and the king-bolt connects said parts, as will be seen farther along.

The immediate front of the main frame is provided with a malleable substantially truss-shaped brace C, which is firmly bolted or riveted upon the main frame and constitutes a fixed and permanent portion thereof, and said truss is of such strength and fashion that it not only serves as an arched transverse brace for the main frame at this point, but also a medium for making all the draft-connections, including draft-bars D and tongue T.

The king-bolt is a sectional part g and g' , and said sections have eyes through which they are connected and which afford all the freedom or play at this point that the machine may require in passing through ruts and holes, as well as providing for such other irregularities as may be encountered, and which also enables the front carriage to ride over obstructions without materially affecting the level of blade F. Obviously a construction which enables this to be done is very desirable in roadwork, because the scraper-blade is designed also to be used for leveling purposes, and if the line of its travel be always subject or subordinate to the varying levels or elevations upon which the two front wheels, or either of them, may run its object would be largely defeated and its work necessarily unsatisfactory; hence the construction at this point, which provides so liberally for the uneven running of the front wheels without affecting the level of frame A and the blade. It will be noticed that draft connection is made directly with transverse brace C by means of a clevis 4, loosely engaged with yoke 5 on the inner extremity of draft-tongue T. Diagonal downward braces 7 are rigid

with the tongue and engage with axle B, and front wheels W turn on their axle, as usual. With this construction and assuming that blade F and the rear wheels, which follow behind said blade and run on same level, are occupying a horizontal position and the front wheels by reason of inequalities of surface are tilted excessively to one side or the other it will be seen that the jointed king-bolt and the freedom of the clevis 4 will enable the front wheels to play up and down at either side within a very large latitude without changing the level of the main frame at all, and the bolster 2 being short and with its ends near the king-bolt the weight of the frame A may rest temporarily upon one end or the other thereof, while the other drops down without displacing the relationships of the parts and without in any manner affecting the draft. This is so because the front carriage is a mere support for the parts and does not bear any of the draft as such, which comes wholly upon the main frame and its brace C. The foregoing construction and connection of parts also makes ample provision for the unevenness met with in the direct travel of the machine and in which the horses may mount to a high level while the front wheels are down on a much lower level or where the horses and wheels are in reverse positions. There is such freedom of play in the draft-couplings that these extremes of position may occur and not materially affect the trend and level of the scraper-blade, and a substantially universal joint is made at this point.

The blade F is supported from draft-bars D by what are termed "drag-bars" H, substantially right-angled in form and adjustable to one position or another back and forth on the draft-bars, according as one position or inclination or another of blade F is desired and according to the work to be done and the side to which earth is to be carried, as is obvious. Both drag-bars are slidably confined on the draft-bars by a set of keepers each front and rear, and a brace or jockey-stick h connects said bars at their top and rear and is adapted to the reversal of said bars and blade equivalently to a circle, while it also relieves the immediate jointed supports of the blade at its rear from strain. These supports comprise what is substantially a knuckle-joint 10 at the bottom of bar H and horizontally rotatable thereon and having also another joint intervening the blade and next thereto and an adjustable brace and link-joint at the top of the blade adapted to fix the angle of inclination vertically to which the blade is set. This joint comprises the brace-piece 11 and a horizontally-pivoted link 12, whereby the requisite angular adjustments of the blade are provided for and as is of material importance in this machine. Joint 10 below has a swivel on the drag-bar, affording a like accommodation horizontally. The level and support of the rear ends of draft-bars D is

provided for in the bifurcated or forked lower extremities of vertically supported and adjustable rack-bars J, one for each draft-bar. In the operations of the machine it is important that there should be room for considerable lateral rocking play for the draft-bars to accommodate them to the unavoidable inequalities over which the machine must travel and to avoid strain and breakage of parts. Hence both ends of said bars and their terminal supports are constructed to permit rocking of the bars on the cotter-pins or bolts 14 and 15, which carry said ends, and the bifurcations 16, as well as ears or lugs 6 at the front, are shown as rounded or convex on their inner sides where the pins pass through, and the holes in the said bars are sufficiently enlarged or elongated to enable tilting to occur.

Another important feature of the invention is the construction for supporting rack-bars J. This comprises a guide rod or bar 18, loosely or rotatably supported at its ends in the main frame, as here shown, and a brace 19, mounted on the rack-bar, is slidably engaged on said rod and keeps the rack-bar in vertical alinement and prevents rocking and twisting thereof, as would occur if these guide-rods were not provided. Incidentally this mechanism helps to give steadiness to the rear ends of draft-bars D, which are secured to rack-bars J and which come outside guide-rods 18 at each side and outside of standards 20 of the main frame. Both rack-bars may be adjusted at the same time, or each may be operated alone, as may be necessary. Shaft L is mounted on the main frame and carries pinions 21, meshing with racks J, and toothed wheels 22, engaged by detents or rods 23, and hand-wheels 24 for rotating said pinions also are mounted on shaft L. Then in addition we provide a foot-piece or pedal M, which rests loosely at its forked ends on pivoted levers 26, through the free ends of which detents or rods 23 are passed and have heads n beneath on which said levers rest. Normally both detents 23, levers 26, and bar N are held up or in raised position and the said detents in engagement with wheels 22 by means of spring 28, supported between lugs 29 on uprights 30, Fig. 3. A collar 32 on the detent bears on spring 28 when it is depressed by the operator with his foot on the pedal bar or plate N, and either or both detents may be released at the same time, according as one end or the other or both ends of the scraper-blade are to be lowered or raised by the mechanism provided for that purpose. So in like manner may each rack-bar J be separately operated. To this end each pinion 21 and the corresponding toothed wheel 22 is separately rotated by the adjacent hand-wheel 24, and while all said parts are in this instance mounted on shaft L they might be otherwise mounted, and one or the other set of wheels may be rigid with shaft L. A common form of clutch 34 is shown in Fig. 3 for engaging wheel 24

with pinions 21. Normally the detents 23 are up in locking engagement with gears 22, thus holding the pinions against rotating and blade F where it has been adjusted. Then to change the elevation of the blade the said pinions are liberated by withdrawing the detents from wheels 22, whereupon further adjustment or setting of the blade may be had and at one or both ends, according as one or both detents have been withdrawn.

Another important feature of this invention is a distinct bumper or abutment P for the scraper-blade and against which most of the pressure comes and to that extent relieves the draft connections. This has been found of very great value in heavy work particularly, and hence the end blade F, upon which the strain is greatest, is arranged to rest back against this bracing part. This occurs in Fig. 2 at the near side, and the said bumper is fixed at or in the front of platform *a* and is braced by a pair of diagonal braces 35 to the rear of the main frame, thus making a very firm support for said part.

It will be noticed that the bumper proper projects forward of the platform and that distinct projections *h'* are provided on the heels or rear portions of drag-bars H, adapted to rest against the ends of the bumper and sustain the heavy lateral strain which comes on the blade when it travels in a diagonal position, as in Fig. 2. This of course relieves the draft-bars correspondingly and is a material improvement in the machine.

If the machine be used for conveying the earth along to some given point, blade F is arranged transversely thereof, as in Fig. 1, and then we use fenders R at each end. These are detachably supported at the rear of the blade by means of yokes 36 on the fenders, engaged on hooks 37 on the blade and confined by cotter-pins 38. Pull-rods 40 connect the forward ends of the fenders with the draft-bars. This construction provides a free up-and-down movement of the fenders within limits at both their front and rear. Practically a universal-joint connection is made by the present construction between the pole or tongue T and the main frame, as well as between the front truck and the main frame, and by having the draft wholly on the upper part of the king-bolt the front truck and its bolsters are left free to play and travel, as hereinbefore described.

One of the special and important advantages of this machine is its very great convenience for reversing the position of blade F, so as to throw the same at an angle of inclination to either side or to bring it into direct transverse position, as in Fig. 1, for conveying earth from point to point and with the fenders when this is done. If desired, there may be a toothed digger W' connected with the scraper and connected by chains *w* with the front of the main frame to be used especially when the parts are working as they ap-

pear in Fig. 1. Blade F is referred to in the specification and claims as a "scraper-blade," and this serves for its designation, although it has other functions, as already described.

What we claim is—

1. The machine comprising the main frame and the front truck, said truck provided with an arched bolster *b* and a bolster 2 for the main frame resting on bolster *b*, a jointed king-pin connecting the said bolsters and the main frame with the front truck, and a draft-clevis engaged on said king-pin above and below the main frame, whereby the truck is free to drop at one side or the other and thereby cause the weight to rest on the other side of the bolster and maintain its level while the truck is running over uneven ground, substantially as described.

2. The machine having a front truck and a main frame, and a jointed king-pin connecting the front of the said frame with the said truck, in combination with double-pivoted draft connections engaged with said king-pin above and below the front portion of the said main frame and the front truck having pivotal connection with the main frame beneath the main frame and with the lower portion of the said king-bolt, substantially as described.

3. The machine substantially as described comprising the main frame and the front truck, a jointed king-pin connecting said parts, the tongue and rigid braces extending therefrom to the axle of the front truck, a link draft connection between said tongue and king-pin, and a bolster on the front truck carrying the main frame having its ends constructed to permit the said frame to tilt laterally in respect thereto, substantially as described.

4. In a road-machine, the front and rear trucks and a substantially arched main frame connecting the same, truss-brace across the front portion of the main frame and draft connections directly with said truss in the main frame, said draft connection comprising a tongue and a clevis connection, and rigid brace from the tongue to the axle of the truck beneath the main frame, substantially as set forth.

5. The main machine having an arched bolster rigid with its front truck and a second bolster pivoted thereon and provided with divided extremities, in combination with the main frame resting on said bolster between said divided extremities, and a king-pin jointed between its ends connecting said bolsters and said main frame and a draft connection engaging said king-pin above and below the main frame and above the joint therein, substantially as set forth.

6. The trucks and the arched main frame, in combination with a set of draft-bars pivotally connected with the front of said frame, adjusting mechanism to control the elevation of rear ends of said bars, a scraper-blade and

means connected therewith and with said draft-bars to control the positions of the blade, comprising a set of drag-bars adjustable on the said draft-bars and upper and lower pivot connections between the said blade and the drag-bars, substantially as set forth.

7. The machine described having a set of draft-bars connected with the front portion thereof, means to fix the elevation of the said bars at their rear ends, a scraper-blade and drag-bars upon which said blade is engaged by two double-jointed pivot connections at the rear of said blade, substantially as set forth.

8. The machine having a pair of draft-bars loosely pivoted on the front thereof, a scraper-blade supported from said draft-bars, a pair of rack-bars carrying the rear ends of said draft-bars and having bifurcated lower extremities between which said draft-bars are pivoted and adapted to tilt or incline laterally on their pivots, substantially as set forth.

9. A road-machine having a set of draft-bars, in combination with a scraper-blade and a set of substantially right-angled drag-bars slidably and adjustably supported upon said bars and carrying said scraper-blade, and a jockey-brace connecting the said drag-bars at their angles, substantially as set forth.

10. The machine having a substantially arched main frame and a platform supported on the rear truck and a bumper built into the front portion of said platform beneath the arch of the main frame, in combination with a set of draft-bars, means suspending the said bars at their rear ends from the main frame, the scraper-blade and adjustable supports for said blade upon said draft-bars and adapted to engage against said bumper, and take the pressure, substantially as set forth.

11. In road-machines, the trucks and the main frame, a platform upon the rear truck, a bumper built into the front portion of the said platform and diagonal braces therefrom to the rear axle, in combination with a scraper-blade and supports therefor adapted to bear

against said bumper, substantially as set forth.

12. In a road-machine, a scraper-blade and bars to carry the same, in combination with adjusting mechanism for said blade upon said bars comprising a substantially universal joint for the lower portion of the blade, and mechanism for fixing the inclination of the blade comprising a link which permits the blade to be thrown laterally lengthwise upon its pivots, substantially as set forth.

13. The trucks and the main frame, the draft-bars and the scraper supported therefrom, in combination with racks carrying the rear ends of said draft-bars, vertical guides for said racks and means connecting the racks slidably with said guides, substantially as set forth.

14. The means for controlling the elevation of the scraper-blade, comprising the said blade and the bars carrying the same, racks to which said bars are attached and pinions engaging said racks, toothed wheels connected with said pinions and detents to lock said wheels, and foot-controlled mechanism for withdrawing either or both said detents, substantially as set forth.

15. In a road-machine, a scraper-blade, in combination with a fender arranged at the end of said blade and having a detachable connection with the rear thereof, substantially as set forth.

16. The scraper-blade and the fenders at the ends thereof, and one of said parts having a keeper and the other a substantially hook-shaped device engaged on said keeper forming connections behind the scraper, substantially as set forth.

Witness our hands to the foregoing specification this 27th day of December, 1902.

WILLIAM A. HEUSNER.

CARL H. DUDLEY.

DAVID E. GRAVES.

Witnesses:

FRED H. MUDDOCK,
HINDS SMITH.