

No. 657,650.

Patented Sept. 11, 1900.

L. H. DYER.
AUTOMOBILE VEHICLE.

(Application filed June 8, 1898.)

(No Model.)

3 Sheets—Sheet 2.

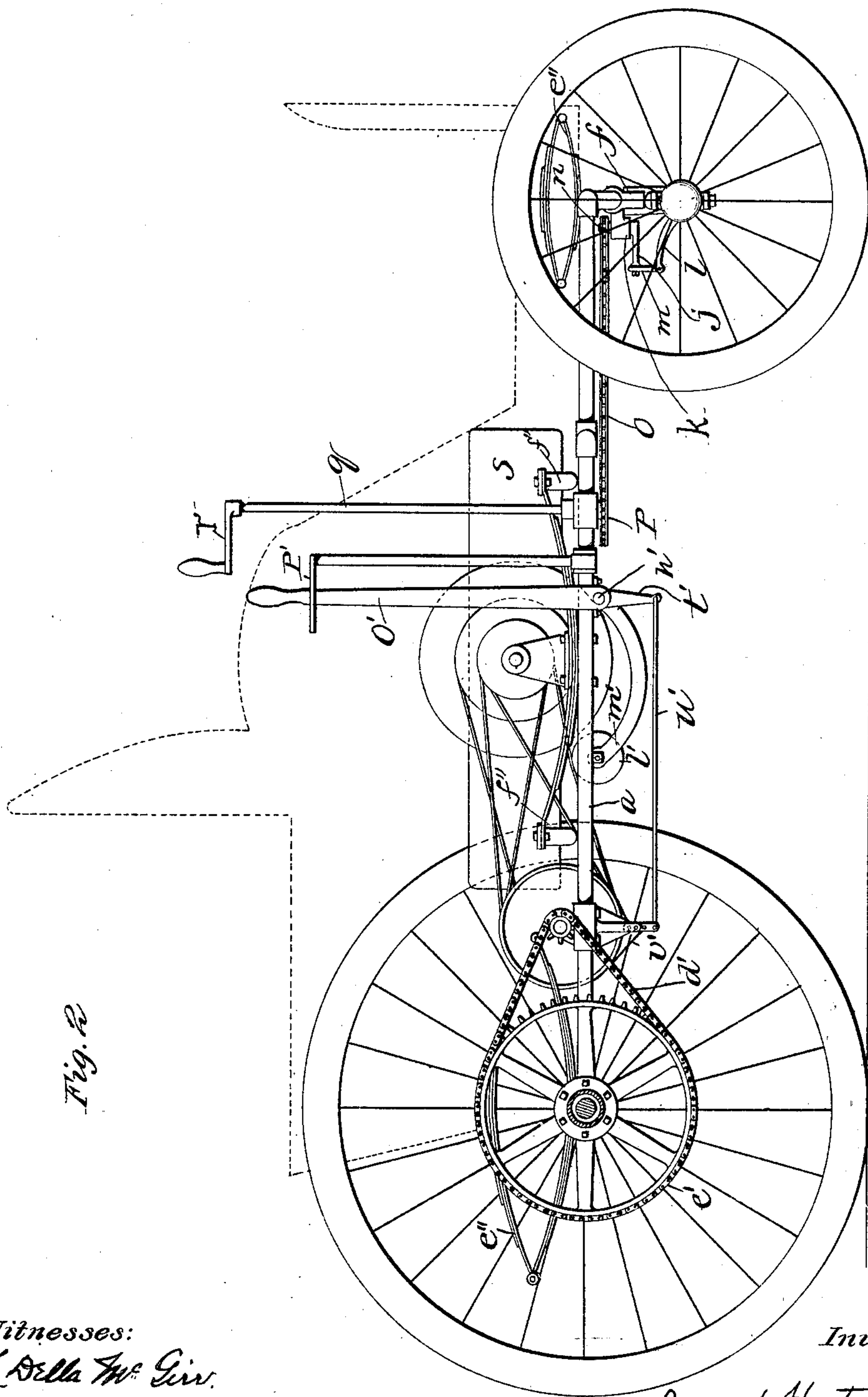


Fig. 2

Witnesses:

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3 Sheets—Sheet 3.

Fig. 3.

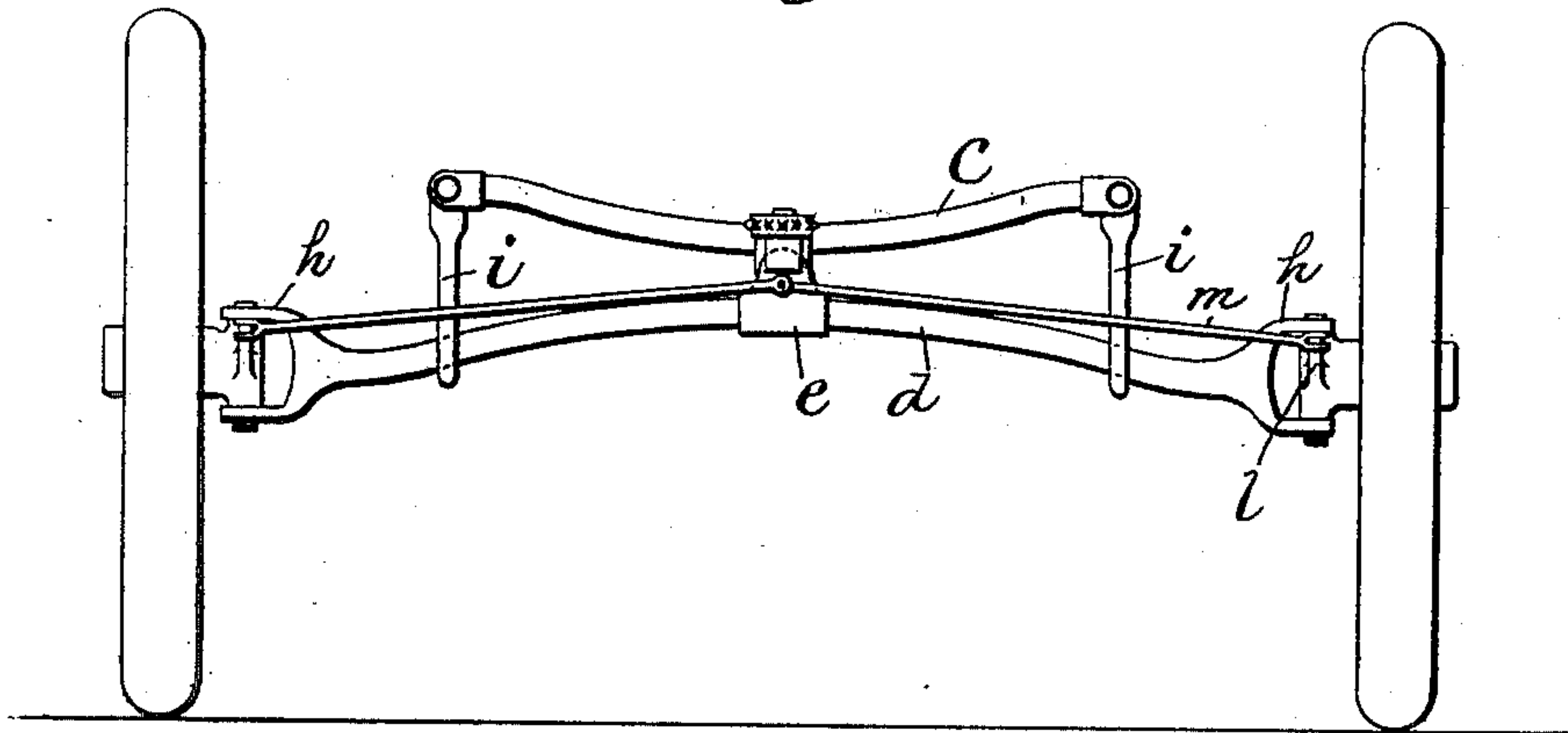


Fig. 4.

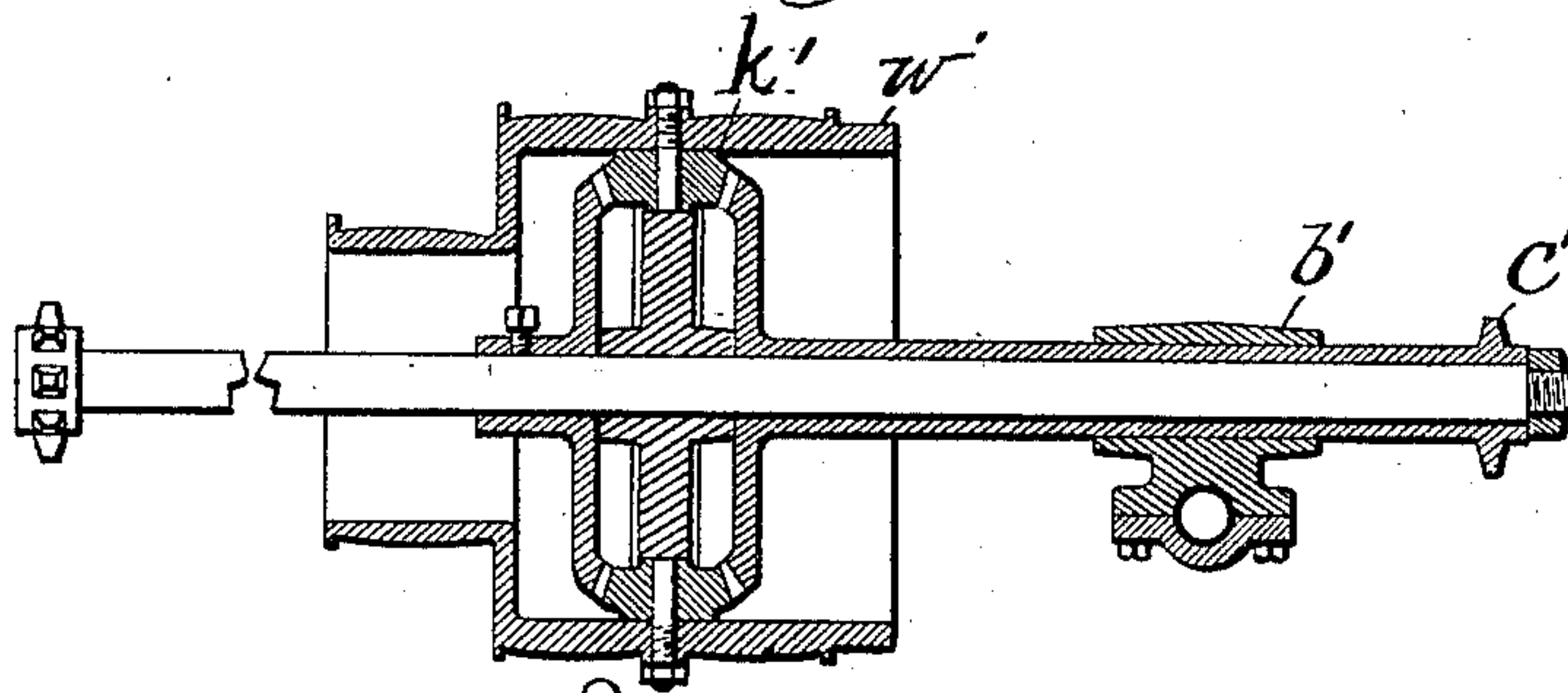


Fig. 5.

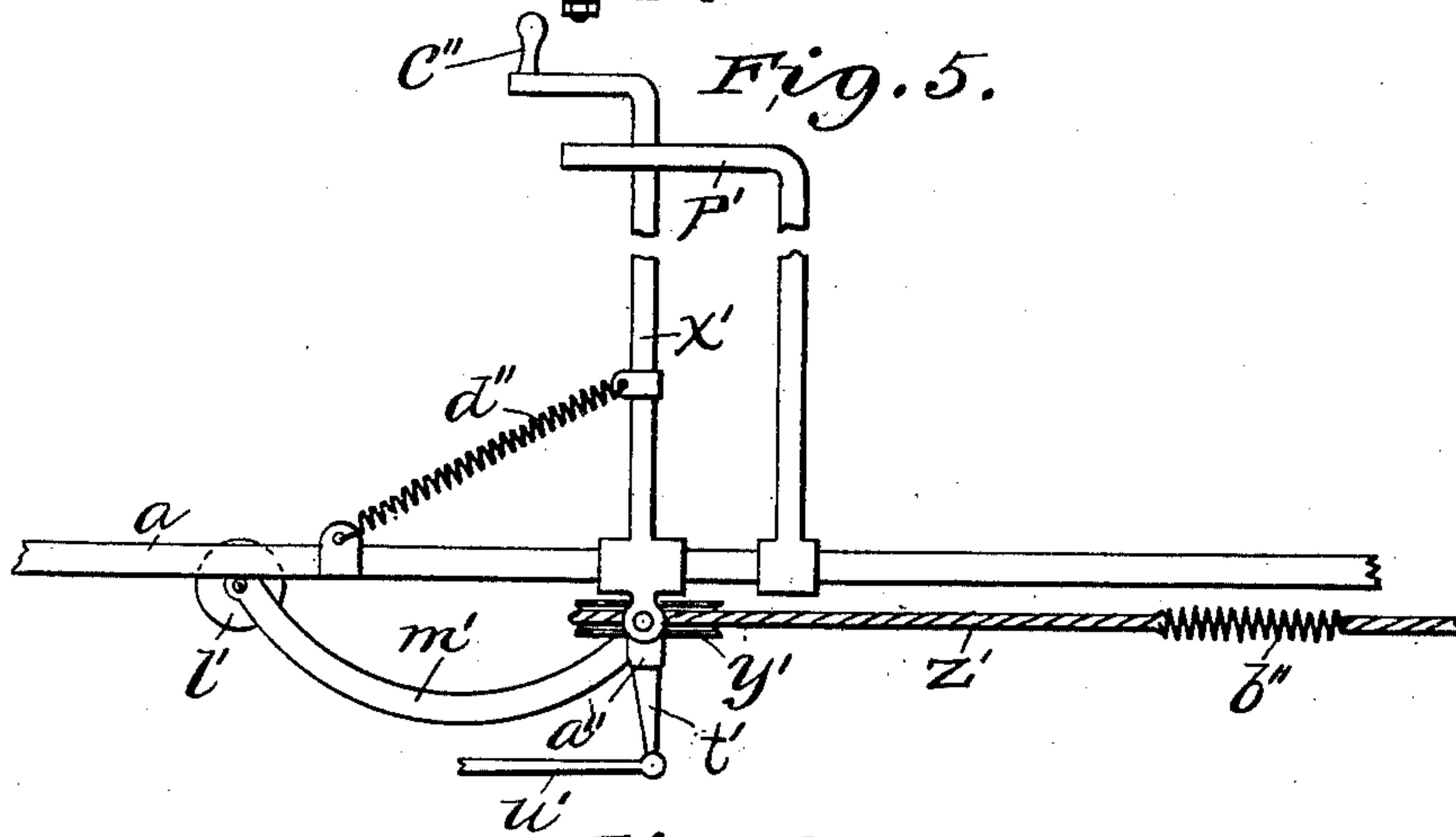
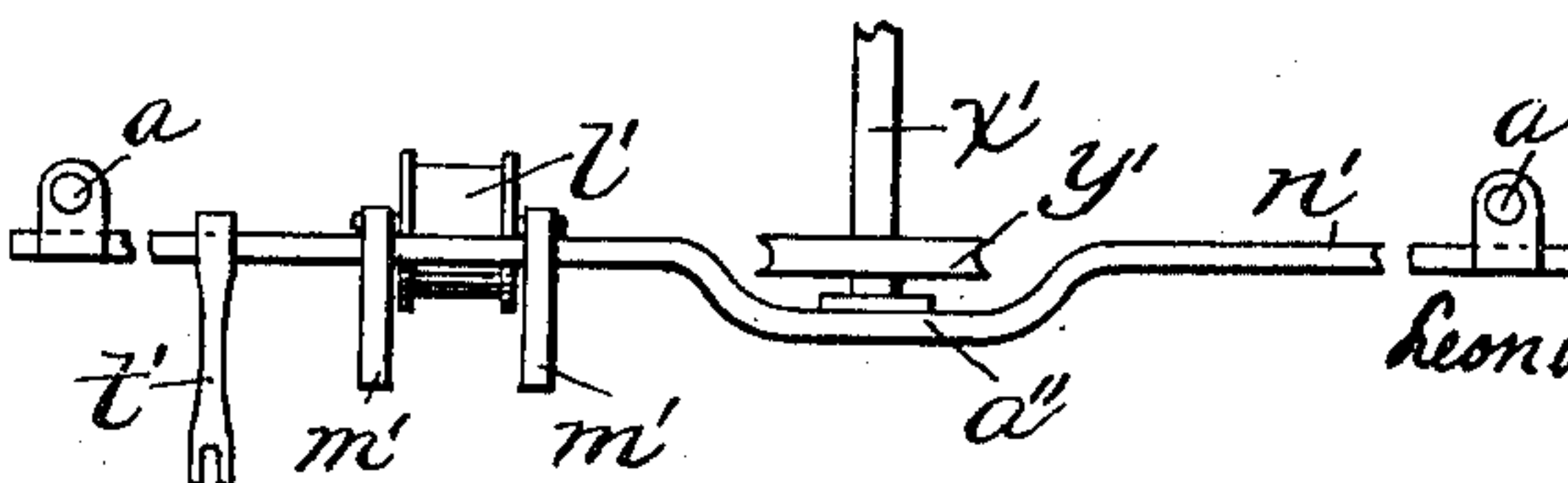


Fig. 6.

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UNITED STATES PATENT OFFICE.

LEONARD HUNTRESS DYER, OF WASHINGTON, DISTRICT OF COLUMBIA,
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AUTOMOBILE VEHICLE.

SPECIFICATION forming part of Letters Patent No. 657,650, dated September 11, 1900.

Application filed June 8, 1898. Serial No. 682,939. (No model.)

To all whom it may concern:

Be it known that I, LEONARD HUNTRESS DYER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Gearing for Automobile Vehicles; and I do hereby declare the following to be 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.

My invention relates to improvements in motor-carriages wherein that form of heat-engine working upon the principle of internal combustion is employed.

My present invention seeks to employ such form of engine as is already upon the market and makes no attempt to improve the motor itself. These engines, although very light, economical, and efficient, present the following disadvantages as applied to motor-carriages: First, the difficulty in starting them makes it necessary to manually turn the engine-shaft two or three times before the engine can be started and which makes it necessary to provide some means whereby the engine can be allowed to run idle when temporary stops are to be made; second, the fact that the engine runs at a continuous high speed, which cannot be reduced without greatly reducing the power developed, makes it necessary to provide gearing for at least two different speeds of carriage; third, such forms of engines are incapable of being reversed, so that additional gearing must be provided in order to change the direction of carriage, and, fourth, such engines, owing to the irregular and powerful explosive impulse, vibrate excessively and make it necessary to provide means so that the engine will be elastically suspended and will not inconvenience the occupants of the carriage.

My present invention, briefly, is as follows:

The carriage has four wheels connected together by a tubular rectangular running-gear. The rear axle forms one end of the frame and the two drive-wheels are independently mounted upon it. The front part of the frame curves down slightly where it meets the front axle, to which it is secured by a horizontal

pivot. The ends of the front axle are bifurcated, to which the short stubs upon the front wheels are mounted, and are secured by vertical pivots, the two front wheels being turned dependently, but upon different pivots, as is the common practice for motor-carriages. The motor is supported upon the running-gear by means of one or more sets of springs, while the body of the carriage is supported upon the running-gear by a totally independent set of springs. All vibrations, therefore, from the motor to the carriage-body must be transmitted through two independent sets of springs.

The transmission-gear consists of a counter-shaft carried upon the running-gear and connecting at its extremities with means to drive the rear wheels. Both the counter-shaft and motor-shaft are provided with fast pulleys of different diameters, and a series of loose belts (two or more in number) connect these pulleys. If desired, an extra belt can be added, which belt may be twisted to give a reverse motion to the counter-shaft. Any of these belts may be tightened one at a time by means of a single jockey-pulley, which is carried upon an arm pivoted to the running-gear. This arm carries a hand-lever, which may be moved within suitable guides so that the jockey-pulley may be brought into engagement with any desired belt. By this means but one jockey-pulley is necessary to tighten two or more belts, and the danger of simultaneously tightening more than one belt is overcome. Belts are preferred by me to any other form of transmission medium for the following reasons: They are light, cheap, noiseless, and easily repaired or replaced, and are flexible enough to prevent inequalities of the road from jarring or straining the motor and to allow the carriage to be gradually started, and, furthermore, they may be allowed to slip when a slower speed than that given by the motor is desired. The lever which applies the jockey-pulley may also be connected with a brake, preferably to the counter-shaft, so arranged that upon a reverse motion being given to the lever the brake will be applied. By this means all danger of applying the brake while the belts are tightened is avoided.

The front wheels are simultaneously turned by means of a short vertical axle attached to the center of the front part of the frame and having links extending up to each of the front-wheel stubs. A double chain or flexible wire connects with a wheel or pulley from the upright shaft to a vertical steering-rod. This vertical steering-rod may be combined with the manually-operated lever for the jockey-pulley and arranged so that the operation of steering, starting, stopping, backing, and changing speed may be accomplished all by one lever.

In very light carriages it is possible to dispense with the use of chains to connect the counter-shaft with the driving-wheel. In their stead pinions may be used, engaging with internal gears attached to the rear wheels, or in lieu of pinions and gears deeply-grooved pulleys may be employed, engaging with hoops or rings attached to the spokes or rims of the driving-wheels. In the latter case the bearings for the counter-shaft will be movable, so that the strain upon the belts will be sufficient to keep the pulleys in close engagement with the hoops or rings. In the latter case the pulleys sliding upon the rings would have sufficient slip to allow the carriage to turn curves without the use of an equalizing-gear.

In order to better understand the nature of my invention, attention is directed to the accompanying drawings, in which—

Figure 1 is a side view of the running-gear, motor, and transmission-gear of my improved carriage with the body shown in broken lines. Fig. 2 is a top view thereof, the body being removed. Fig. 3 is a sectional view through the front portion of the frame. Fig. 4 is a view, partially in section, of one end of the counter-shaft, equalizing-gear, and bearing and transmission pulleys. Fig. 5 is a side view of an arrangement with a combined steering and speed-changing lever, and Fig. 6 is a front view of the same.

In all the several views like parts are represented by the same letters of reference.

The frame of the carriage consists of the two side bars *a a*, rigidly secured to the rear axle *b* and the front bar *c*, the latter preferably curved down slightly in the center to meet the upturned axle *d*. The latter has a casting *e* with bifurcated arms, within which the finger *f*, secured to the bar *c*, engages. A horizontal bolt or pin connects the two together and allows the axles to oscillate independently of the rest of the frame. In order to secure the front axle against side motion, the corners of the frame *a* have vertical depending pieces *i*, which engage against flat faces formed upon the axle *d*.

h h are the bifurcated portions of the front axle, within which are pivoted the front-wheel stubs in the well-known manner.

k is the vertical steering-head, having a sector or arm *j* secured thereto, which connects by means of rigid links *m* to the arms *l*, se-

cured to the front-wheel stubs. This sector *j* carries a sprocket or pulley *n*, by means of which either a chain or the flexible wire *o* connects with the corresponding pulley or sprocket *p*, secured to the lower extremity of the steering-head *q*.

r is the steering-handle, shown in the drawings as arranged to one side. It may, however, be located on the center line of the carriage, as shown in broken lines. It is preferred that the sprocket *p* be somewhat smaller than the sprocket *n*, so that increased leverage will be secured for the operator.

The carriage-body (shown in broken lines in Fig. 1) may be of any desired shape and made of any material. It is supported upon the frame by means of the springs *e''*.

s is the motor with two horizontal cylinders arranged tandem fashion, connecting with one crank on a single horizontal shaft. This motor is supported on a tubular frame consisting of the cross members *t t* and lateral members *u u* and connected together, as shown. This frame is supported upon the side frames *a* by means of the springs *v*, which are secured in their centers to the side frames and at their extremities to the upturned extremities *f''* of the cross-frames *t*. The shaft *w* of the motor is prolonged to provide for the attachment of the starting-crank *x*. Attached to this axle are the large and small pulleys *y* and *z*, respectively, the latter being represented in this case twice as wide as the former.

The counter-shaft *a'* is secured to the side frame *a* by means of the boxes *b'*. Upon its extremities are the small sprockets *c'*, which engage with the chain *d'* of the large sprockets *e'*, secured to the driving-wheels. Mounted upon the counter-shaft are the small and large pulleys *f' g'*, the latter being twice as wide as the former. Around the two sets of pulleys are the belts *h' i' j'*, the latter being crossed, as shown. Any number of belts and pulleys may be employed without materially changing the device.

k' is the equalizing-gear, (see Fig. 4,) having the sleeve portion extending through the bearing *b'* and carrying a sprocket *c'* on its extremity. By this means the counter-shaft is not cut, but extends across the whole carriage.

l' is the jockey-pulley carried upon the two arms *m' m'*, mounted upon the shaft *n'*, carried in suitable boxes attached to the sides of the frame.

o' is the operating-lever extending up at one side of the carriage-body.

The axle *n'* has a small amount of lateral movement within its boxes, so that the jockey-pulley *l'* may be brought up against either one of the three belts, as desired. In order to insure that it will register exactly with the desired belt, a guide-plate *p'* is employed, having recesses *r' r' r'* therein. If it is desired to hold the jockey-pulley in engagement with the belt, the lever may be brought within one of the notches *s'* formed upon the plate *p'*.

By employing this plate the jockey-pulley can be accurately registered against any of the three belts.

The preferable form of brake is applied to the shaft a' and is arranged as follows: t' is a depending lever from the shaft n' and connects by means of a horizontal link u' with a band-brake v' , attached to the drum w' formed upon the equalizing-gear.

10 In the modification shown in Fig. 5 the steering-rod q is combined with the operating-lever o' in the following manner: The shaft n' carries the vertical lever x' , which carries a pulley y' , which latter connects with the steering-wires z' . In order that the pulley y' may be kept in line with the center of the bearings of the shaft n' , the latter has a slight downward bend in the center, as shown at a'' . In order that the wires z' may be kept 20 tight under all circumstances, a spring b'' is interposed. The lever x' carries a steering-handle c'' upon its upper extremity. By the use of this modification all the operations of controlling the carriage independently of the 25 motor may be accomplished by one lever. The comparatively-great length of this lever, as to the arms m' , will obviate the necessity of employing a locking device to keep the jockey-pulley in engagement with the belts, 30 as the natural pressure of the hands of the operator upon the handle c' will be sufficient. If desired, a spring d'' may be employed to disengage the jockey-pulley from the belts. This spring can also be used to automatically apply the brake.

The before-described apparatus may be modified to a great extent without materially departing from the spirit of the invention. For instance, the lever o' may be so arranged 40 by slightly changing its shape as to be applied by the foot of the operator. Furthermore, it may be located upon either side of the carriage or in the center line thereof, or, if desired, for greater convenience two or 45 more levers may be applied to the same shaft. The arms m' , although described as attached to the shaft n' , obviously may be formed upon a sleeve to surround the latter. In this case the lever o' will be attached to the sleeve.

50 Having now described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. In an automobile vehicle a transmission-gearing therefor, the combination with the 55 driving-shaft having two or more fast pulleys thereon, the driven shaft having two or more corresponding fast pulleys thereon, two or more endless slack belts connecting the pulleys of the two shafts, and a single independent jockey-pulley, and means for engaging the said jockey-pulley with any of said belts, 60 substantially as set forth.

2. In an automobile vehicle a transmission-gearing therefor, the combination with the 65 driving-shaft having two or more fast pulleys thereon, a driven shaft having two or more fast pulleys, two or more endless slack belts

connecting the two shafts, a rock-shaft carrying a single jockey-pulley, and means for moving the said jockey-pulley so as to cause 70 it to engage with any of said belts; substantially as set forth.

3. In an automobile vehicle a transmission-gearing therefor, the combination with the driving-shaft having two or more fast pulleys 75 thereon, a driven shaft having two or more fast pulleys, two or more endless slack belts connecting the two shafts, a rock-shaft carrying a single jockey-pulley, capable of lateral motion, and means for applying said pulley 80 and for moving it laterally so that it may engage with any of said belts, substantially as set forth.

4. In an automobile vehicle a transmission-gearing therefor, the combination with the 85 driving-shaft having two or more fast pulleys thereon, a driven shaft having two or more fast pulleys, two or more endless slack belts connecting the two shafts, a rock-shaft, a jockey-pulley mounted thereon, the said 90 jockey-pulley being capable of lateral movement, an operating-lever, and a register-plate having a series of notches or slips for guiding said lever, whereby the said jockey-pulley will be caused to register with any of the belts, 95 substantially as set forth.

5. In an automobile vehicle a transmission-gearing therefor, the combination with the driving-shaft having two or more fast pulleys thereon, a driven shaft having two or 100 more fast pulleys, two or more endless slack belts connecting the two shafts, a rock-shaft carrying a single jockey-pulley thereon capable of lateral movement, an operating-lever for applying said jockey-pulley, and a 105 brake connecting with said driven shaft and operated by a reverse movement of said lever, substantially as set forth.

6. In an automobile vehicle, the driving and steering wheels therefor, a driving-mo- 110 tor therefor having a shaft, a series of tight pulleys on said shaft, a counter-shaft arranged parallel to the said driving-shaft, one or more loose endless belts connecting the said pulleys, a single jockey-pulley, a lever 115 for applying said jockey-pulley to said belts, and connections with the said lever and the steering-wheels of the carriage, substantially as set forth.

7. In an automobile vehicle a transmission- 120 gearing therefor, the combination with the supporting-wheels, a driving engine or motor, the shaft thereof having two or more fast pulleys thereon, a driven shaft having two or more fast pulleys, connections between 125 said driven shaft and supporting-wheels, two or more endless slack belts connecting the two shafts, a rock-shaft carrying a single jockey-pulley, and means for moving the said jockey-pulley so as to cause it to engage 130 with any of said belts, substantially as set forth.

8. In an automobile vehicle a transmission-gearing therefor, the combination with the

driving-shaft having two or more fast pulleys thereon, a driven shaft having two or more corresponding fast pulleys thereon, two or more endless slack belts connecting the pulleys of the two shafts, a single independent jockey-pulley, a supporting-shaft therefor, an operating-handle, and a series of fixed guides engaging with said operating-handle for engaging the said jockey-pulley with any of said belts, substantially as set forth.

9. In an automobile vehicle a transmission-gearing therefor, the operating-handle *o'* therefor, the fixed guide-plate *p'* having recesses *r', r'* therein, substantially as set forth.

10. In an automobile vehicle, a transmission-gearing therefor, the operating-handle *o'* therefor, a fixed guide-plate *p'*, having recesses *r'* and notches *s'* therein, substantially as set forth.

11. In an automobile vehicle, the supporting-wheels therefor, a frame connecting said wheels, a driving engine or motor elastically supported upon said frame, an engine-shaft, two or more fast pulleys thereon, a counter-shaft having two or more fast pulleys thereon, connections between said counter-shaft and wheels, two or more endless slack belts connecting the pulleys of the two shafts, a single independent jockey-pulley, means for engaging the said jockey-pulley with any of said belts, and a body elastically supported upon said frame independently of the motor.

12. In an automobile vehicle, the supporting-wheels therefor, a frame connecting said wheels, a secondary frame elastically supported upon said primary frame, a driving engine or motor carried by said secondary frame, an engine, two or more fast pulleys thereon, a counter-shaft having two or more fast pulleys thereon, connections between said counter-shaft and wheels, two or more endless slack belts connecting the pulleys of the two shafts, a single independent jockey-pulley, means for engaging the said jockey-pulley with any of said belts and a body elastically supported on said primary frame independently of the secondary frame.

13. In an automobile vehicle, the supporting-wheels therefor, a frame connecting said wheels, a driving engine or motor elastically supported upon said frame, an engine, two or more fast pulleys thereon, a counter-shaft having two or more fast pulleys thereon, connections between said counter-shaft and wheels, two or more endless slack belts connecting the pulleys of the two shafts, a single independent jockey-pulley, a supporting-shaft therefor, an operating-handle, a series of fixed guides engaging with said operating-handle for engaging said jockey-pulley with any of said belts and a body elastically supported on said frame independently of the motor.

14. In an automobile vehicle, the supporting-wheels therefor, a frame connecting said wheels, a driving engine or motor elastically supported upon said frame, an engine, two or more fast pulleys thereon, a counter-shaft having two or more fast pulleys thereon, connections between said counter-shaft and wheels, two or more endless slack belts connecting the pulleys of the two shafts, a rock-shaft carrying a single jockey-pulley, means for moving the said jockey-pulley so as to cause it to engage with any of said belts and a body elastically supported upon said frame independently of the motor.

15. In an automobile vehicle, the supporting-wheels therefor, a counter-shaft connected therewith and carrying two or more fast pulleys thereon, a driving engine or motor elastically supported upon said wheels, the driving-shaft of said motor carrying two or more fast pulleys, two or more endless slack belts connecting the pulleys of the two shafts, a single independent jockey-pulley, means for engaging the said jockey-pulley with any of said belts and a body elastically supported upon said wheels independently of the motor.

This specification signed and witnessed this 8th day of June, 1898.

LEONARD HUNTRESS DYER.

Witnesses:

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