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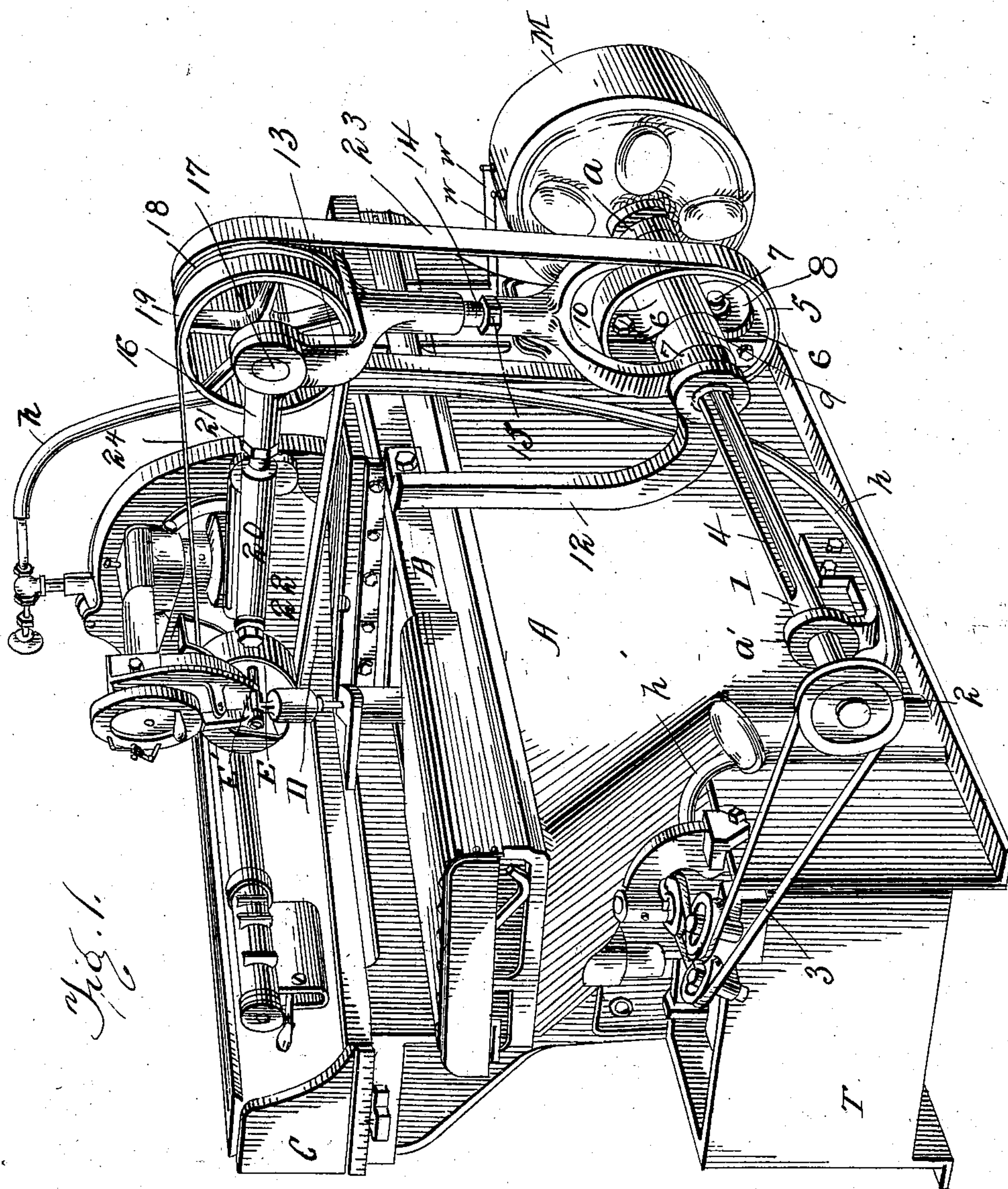
PATENTED APR. 7, 1903.

A. B. LANDIS.
GRINDING MACHINE.

APPLICATION FILED SEPT. 10, 1901.

NO MODEL.

6 SHEETS—SHEET 1.



Witnesses
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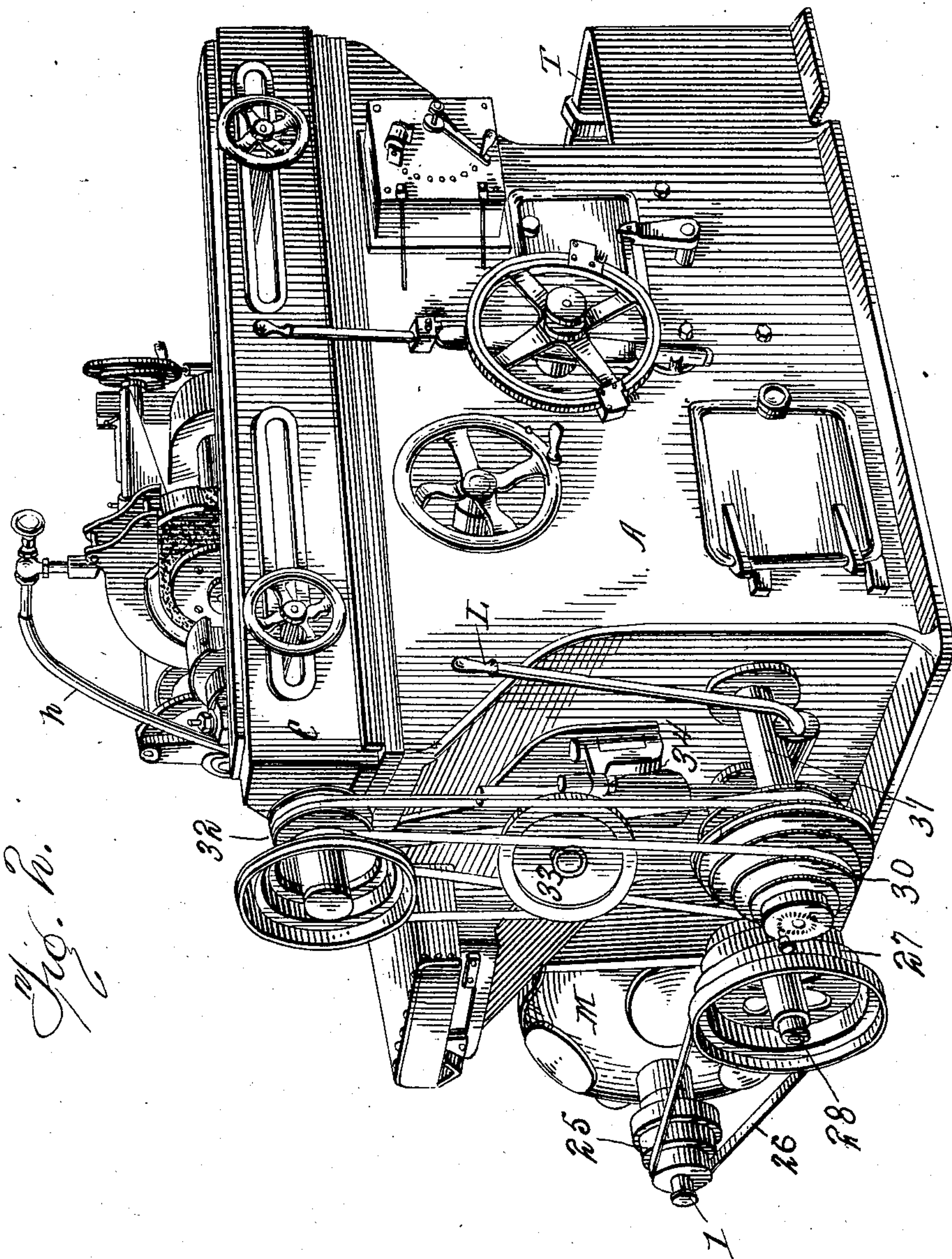
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5 SHEETS—SHEET 2.



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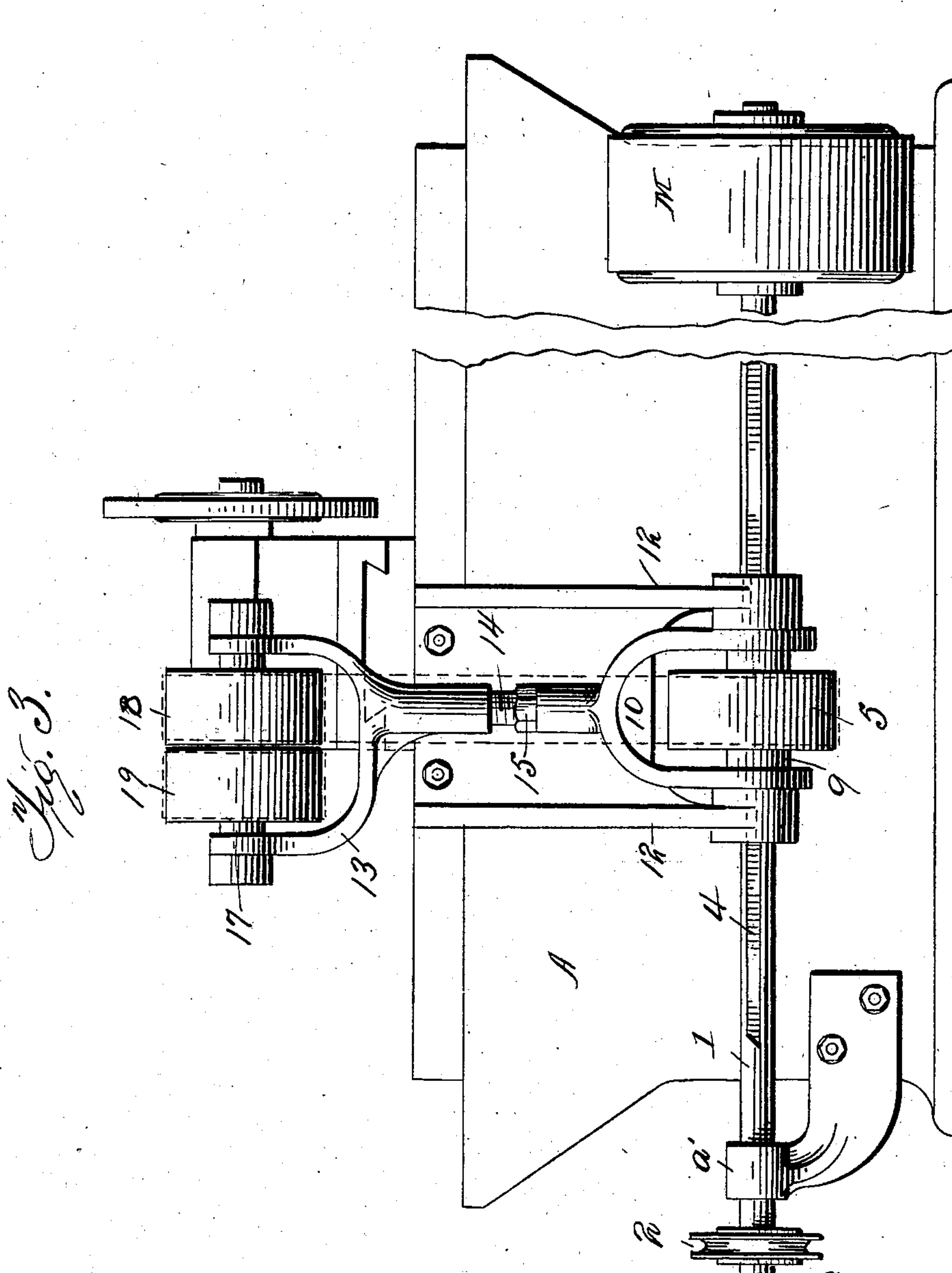
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5 SHEETS—SHEET 3.



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6 SHEETS—SHEET 4

Fig. 4.

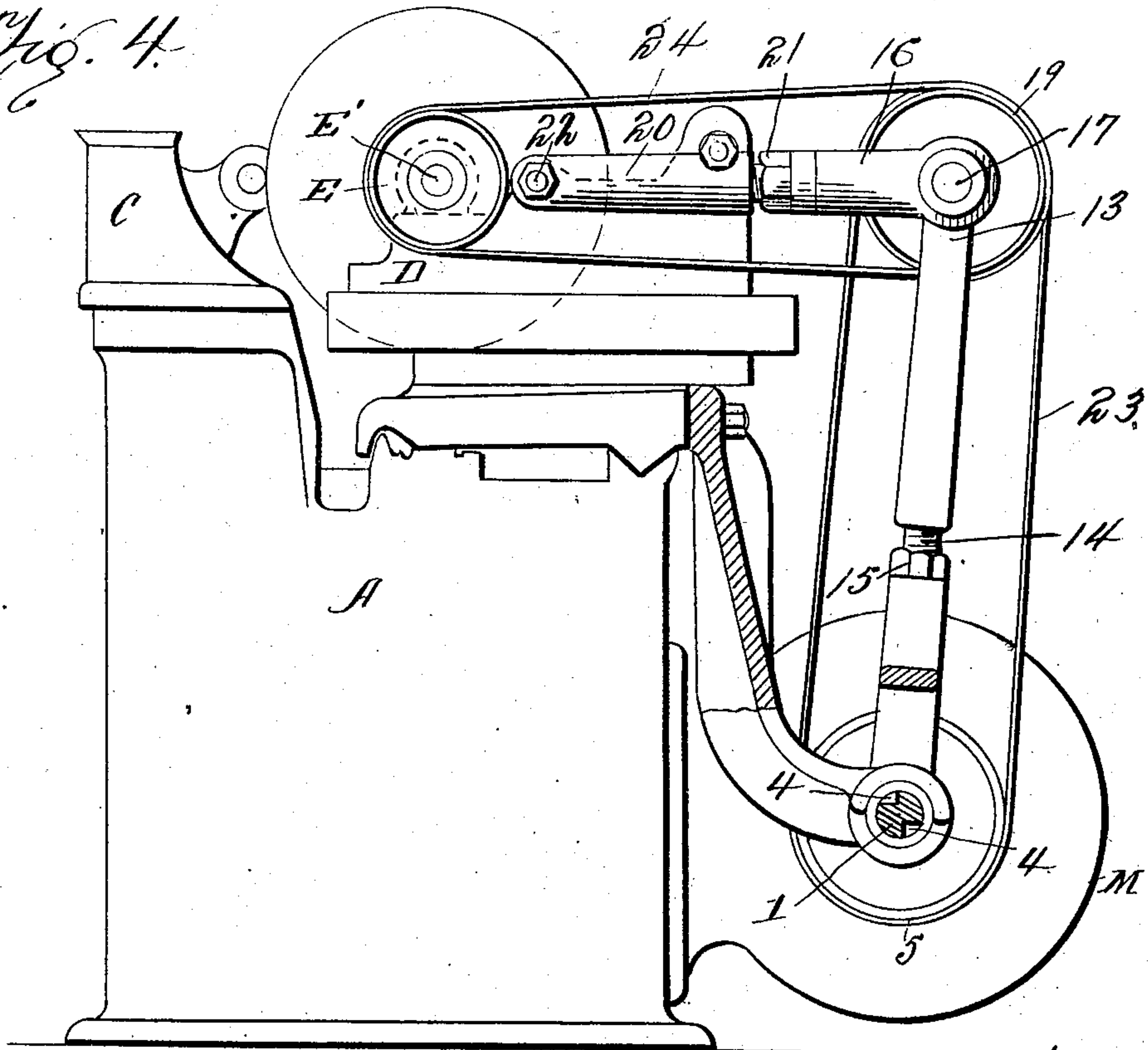


Fig. 6.

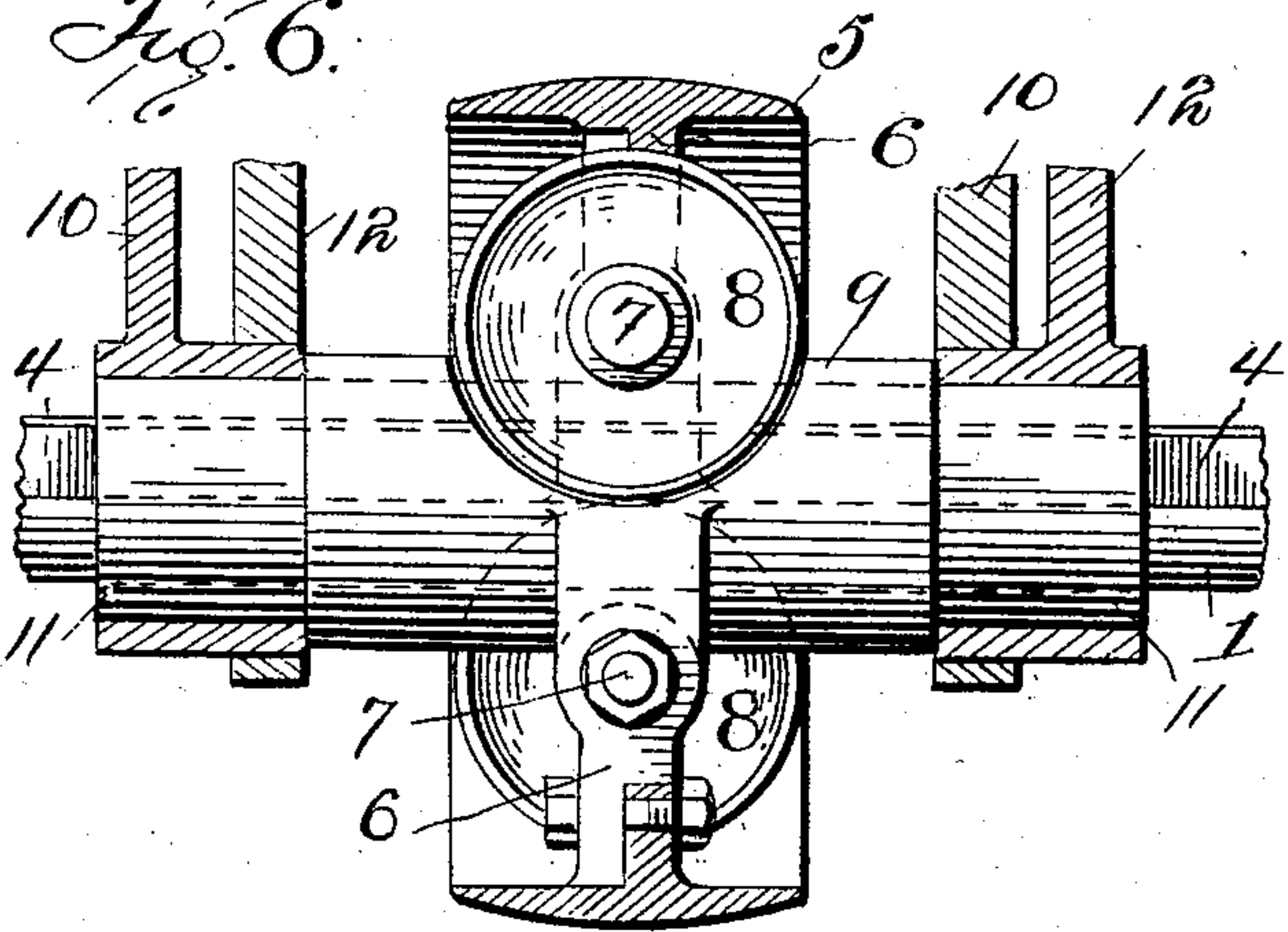
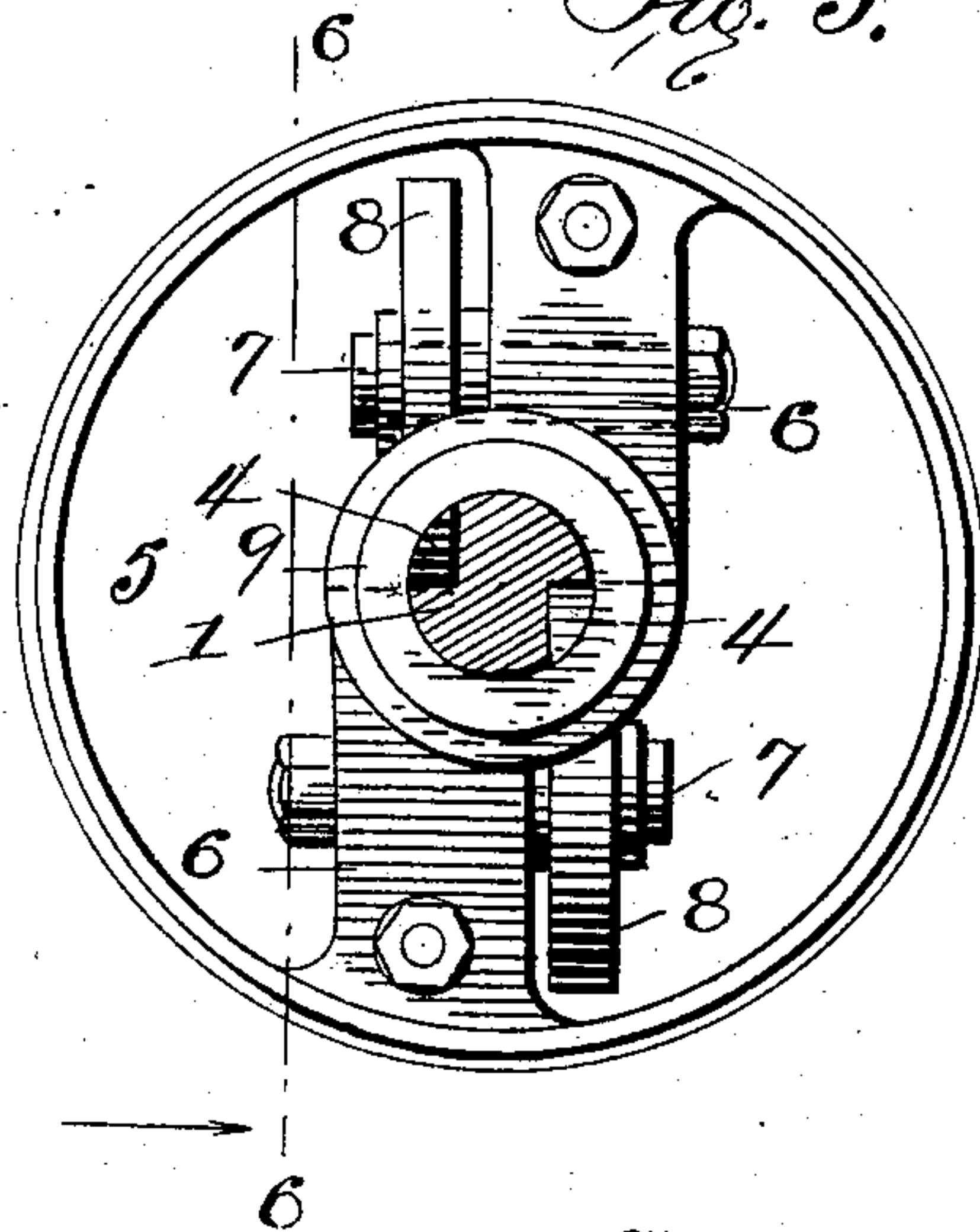


Fig. 5.



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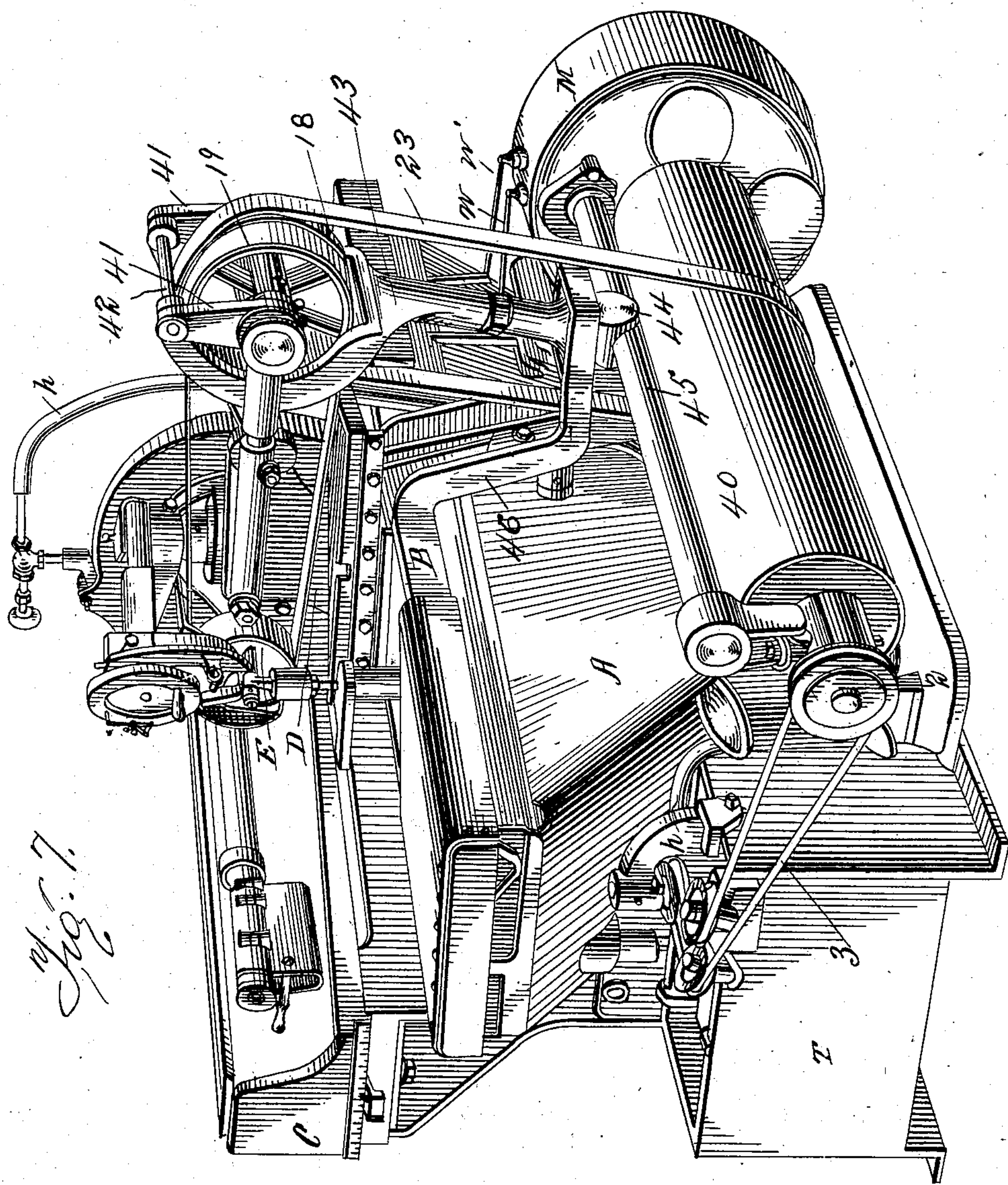
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

ABRAHAM B. LANDIS, OF WAYNESBORO, PENNSYLVANIA.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 724,891, dated April 7, 1903.

Application filed September 10, 1901. Serial No. 74,891. (No model.)

To all whom it may concern:

Be it known that I, ABRAHAM B. LANDIS, a citizen of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Grinding-Machines, of which the following is a specification.

My said invention consists in various improvements in the details of construction of grinding-machines of that general character shown in various Letters Patent granted to me, as Nos. 639,900 and 640,669, the improvements relating particularly to the manner of applying the driving power and gearing the same to the several parts of the machine, whereby it is driven from a power-shaft located near the lower part of said machine, preferably in the rear, and may have an independent motor applied thereto, whereby the use of line-shafting is avoided, substantially as set forth.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a perspective view of a machine embodying my said invention looking toward the rear of the same; Fig. 2, a similar view looking toward the front side; Fig. 3, a rear elevation, omitting the parts not relating to the invention; Fig. 4, an end view; Fig. 5, a side elevation of a traveling pulley; Fig. 6, a section through the same on the dotted line 6 6 in Fig. 5; and Fig. 7, a view similar to Fig. 1, showing a modification in the construction.

In said drawings the portions marked A represent the bed of the machine, B the traveling carriage, on which the grinding-wheel is mounted, C the work-supporting table, D the grinding-wheel base, adjustably mounted on the traveling carriage, and E the driving-wheel on the grinding-wheel shaft E', all of which parts are or may be of the construction and arrangement shown and described in the patents above referred to or of any appropriate construction and need no special description herein except such incidental description as is required in properly describing the invention, which relates to the driving mechanism solely.

The main shaft 1 is located at the rear of

the machine and near its base, being mounted in bearings *a* and *a'*, secured on the bed of the machine. On one end of said shaft is mounted an electric motor M, connected to a suitable power-supply by line-wires *w* and *w'*. On the opposite end of said shaft is a pulley or gear-wheel 2, connected by a belt 3 with a pump in tank T, which operates to pump a stream of water therefrom through hose *h* to the work. Said shaft is provided with two longitudinal grooves or ways 4, located opposite each other, for a purpose to be presently described. Mounted on said shaft is a traveling pulley 5 of the form illustrated in detail in Figs. 5 and 6. Said pulley has transverse arms 6 extending from hub to rim, on which are mounted stud-shafts 7, extending transversely of the shaft 1. On these stud-shafts are mounted wheels or rollers 8, extending through appropriately-formed recesses in the hub and engaging the ways or grooves 4 in the shaft 1, which form tracks on which the said wheels 8 travel and support pulley 5 on shaft 1. The hub 9 of said pulley extends for a distance each side thereof, forming journals 11, which run in bearings formed in brackets 12. Said bearings of the bracket form journals on their outside at one end of same, on which yoke 10 is journaled. Yoke 10 is connected to a similar yoke 13 by a screw-threaded shank 14, inserted in a socket therein and provided with a nut 15, by which its length may be adjusted. To the upper end of yoke 13 is connected a similar yoke 16 by a transverse shaft 17, on which shaft are mounted the two pulleys 18 and 19, preferably integral. The forward end of yoke 16 is connected to an arm 20 by a screw-threaded shank and nut 21, and said arm is in turn connected to the wheel-base D by a pivot 22. A belt 23 connects the pulley 5 on driving-shaft 1 with pulley 18 on counter-shaft 17, and a belt 24 connects pulley 19 on said counter-shaft with the pulley E on the shaft E' of the grinding-wheel. By means of the nuts 15 and 21 the frame supporting these belts is adjusted in length to secure the degree of tension desired, as will be readily understood.

The bracket 12 is bolted rigidly to the edge of the traveling carriage B and has bearings in the lower ends of its arms which engage

with the journals 11 on the ends of the hub of pulley 5. Said pulley is thus carried along shaft 1 with the travel of the carriage, the wheels traveling in the grooves in said shaft serving to support the pressure produced by the power transmitted to the grinding-wheel, preventing friction and allowing a free movement of said pulley on said shaft and of the guides on the carriage B. By this means the belts 23 and 24 are at all times maintained in uniform tension, and the wheel-base D may be freely adjusted back and forth across the carriage B without resistance or in any way interfering therewith. Said shaft 1 projects through the motor M and on its outside end has a pulley 25, from which a belt 26 runs to a pulley 27 on a short shaft 28. From a pulley on said shaft a belt runs to a pulley 30 on shaft 31, which drives the carriage-operating mechanism, to a pulley 32, which drives the shaft operating to revolve the work, and around an idler 33, mounted on a hinged and vertically-sliding support 34, which serves to keep said belt of the required tension. It will be understood, of course, that this manner of gearing is of common form in most particulars, the pulleys where necessary being provided with a series of faces of different diameters to provide for change of speed, as is usual. A lever L operates a clutch by which pulley 27 may be locked to or unlocked from its shaft and the mechanism operated therefrom thus set in motion or stopped independent of the grinding-wheel, as is also usual. These parts are shown for the purpose of illustrating how all the machine is driven from the independent motor M or from the drive-shaft 1, located on the machine, with power transmitted thereto in any manner, it being understood, of course, that pulleys may be substituted for the motor and the power taken from a line-shaft, if preferred for any reason.

In operation the power is transmitted to shaft 1 through motor M by switching on the electric current in the usual manner, or it may be taken from any other source of power or from any other character of independent motor. The machine being thus driven, as above described, the gearing connecting shaft 1 to pulley E consisting of the belts 23 and 24 and the supporting-frame, travels back and forth with the carriage B by reason of its connection therewith through the bracket 12 and is supported to free the parts from side strain or binding by means of the wheels 8 in pulley 5 traveling in the grooves in shaft 1, as before described.

In Fig. 7 I have shown a modification of the structure, a drum 40, extending the entire length of shaft 1, on which the belt 23 runs, being substituted for the traveling pulley 5. In this construction the shaft 17, on which the pulleys 18 and 19 are mounted, has two arms 41 pivoted thereto, extending upwardly to a point just above said pulleys and connected by a pivot-rod 42. The branches of a yoke 43 are pivoted to said rod, and the lower end

of said yoke has a roller 44 connected therewith, which bears upon a rod 45, being held to travel with the carriage B by an arm 46, secured to said carriage and engaging with said roller-housing. In this construction, as will be readily understood, the belt 23 travels back and forth from end to end of the drum 40. The pivot between the two parts of the frame supporting the frame is carried above the pulleys 18 and 19, so that the two arms thereof will be of substantially equal length each side of said pivot, and thus provide for maintaining the uniform tension on said belts.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a grinding-machine, the combination, of the traveling carriage, the grinding mechanism mounted thereon, and gearing for driving the same carried thereby and comprising a jointed frame with pulleys at the joint and belts running from the driving-shaft over said pulleys to said grinding mechanism, substantially as set forth.

2. In a grinding-machine, the combination, of the traveling carriage, the grinding mechanism mounted thereon, the driving-shaft located in bearings on the machine, and gearing connecting said driving-shaft with said grinding mechanism comprising belts running over pulleys mounted on a frame, which frame is supported on said shaft and connected to travel with said carriage, substantially as set forth.

3. In a grinding-machine, the combination, of the grinding mechanism mounted on a traveling carriage, a driving-shaft located on the machine, gearing connecting said driving-shaft and grinding mechanism mounted on a frame which is supported on said shaft and connected to travel with said carriage, substantially as set forth.

4. In a grinding-machine, the combination, of the traveling carriage, operating mechanism thereon, a driving-shaft on a stationary part of the machine, gearing connecting said driving-shaft and said operating mechanism mounted on a jointed frame, and said jointed frame mounted at its lower end to travel on said shaft and connected to the traveling carriage to travel therewith, substantially as set forth.

5. In a grinding-machine, the combination, of the driving-shaft located on the machine, an independent motor thereon for driving it, a longitudinally-traveling part carrying operating mechanism, and gearing connecting said operating mechanism to said driving-shaft mounted to travel with said traveling part, substantially as set forth.

6. In a grinding-machine, the combination, of the driving-shaft located on the machine, an independent motor thereon, and gearing running from parts on said shaft to the several operating mechanisms for driving the same, substantially as set forth.

7. In a grinding-machine, the combination,

of the driving-shaft mounted in appropriate bearings on the machine, an independent motor mounted on said driving-shaft, and gearing connecting said driving-shaft with the several sets of operating mechanism including that located on a traveling part, substantially as set forth.

8. In a grinding-machine, the combination, of the driving-shaft mounted on the machine, the traveling carriage carrying operating mechanism, a gear-wheel mounted to travel longitudinally on said drive-shaft, and gearing connecting said gear-wheel with the operating mechanism on said traveling carriage, said gearing being mounted on a jointed frame supported at one end on said shaft and connected at its other end to the grinding-wheel carriage, the joint being midway said frame and supporting a counter-shaft with pulleys thereon geared one end to the driving-pulley and one to the grinding mechanism, whereby the carriage may be adjusted without affecting the tension of the belts, substantially as set forth.

9. In a grinding-machine, the combination, of the driving-shaft mounted on the machine, a traveling carriage carrying operating mechanism, a traveling gear on said drive-shaft mounted to move with said carriage, and gearing connecting it with said operating mechanism, comprising a pivoted frame one end of which is mounted to travel on said shaft and the other connected with the carriage, substantially as set forth.

10. In a grinding-machine, the combination, of the driving-shaft mounted on the machine, a pulley mounted thereon provided with transverse antifriction-wheels arranged to bear in grooves in said shaft, a suitable frame connecting said pulley to the traveling carriage, said carriage, operating mechanism thereon, and belts running from said pulley to said operating mechanism, substantially as set forth.

11. In a grinding-machine, the combination, of the driving-shaft mounted on the machine, the traveling pulley thereon, the traveling carriage, a connection between them, the operating mechanism on said carriage, idler-pulleys supported on a jointed frame one arm of which is connected to said mechanism and the other arm to the traveling pulley, and the belts connecting the parts, substantially as set forth.

12. A grinding-machine comprising a traversing carriage with a grinding-wheel mounted thereon a driving-shaft having a pulley sliding thereon and journaled in bearings supported to said carriage, said pulley and grinding-wheel being connected by belting supported on a jointed frame mounted to slide and pivot on said shaft whereby the movement of said grinding-wheel will not affect the length of said belts and said belting does not cause inertia on the guides of said carriage nor on the cross-slide of said grinding-wheel.

13. In a grinding-machine a traversing carriage with a grinding-wheel mounted thereon, a driving-shaft located on the rear side of the machine, said shaft being driven by a motor (or other means) and having a sliding pulley thereon, said grinding-wheel and pulley being connected by belting on a jointed frame the lower end of which is mounted to slide and pivot on said driving-shaft, whereby the length of said belting is not affected and does not cause inertia upon the guides of said carriage and the cross-slide of said grinding-wheel by the power transmitted.

14. In a grinding-machine a traversing carriage with grinding-wheel mounted thereon, a driving-shaft from which said grinding-wheel is driven, and connecting-gear mounted on a pivoted frame supported on said shaft to turn and slide and being adapted to give freely to the motion of the parts whereby the inertia of the belting upon the sliding surface is avoided.

15. A sliding pulley journaled in bearings supported on a carriage, said pulley having two or more rollers or wheels engaging grooves in a shaft passing through said pulley, by which grooves and rollers said pulley is driven by said shaft, or vice versa.

16. In a grinding-machine, a driving-shaft mounted on the machine, a sliding pulley on said shaft journaled in a bracket, said bracket mounted on a reciprocating carriage, a grinding-wheel mounted on said carriage, a yoke pivoted to the grinding-wheel base and a yoke pivoted to said bracket around the bearing of said pulley, an intermediate shaft journaled at the junction of the two yokes, pulleys on said intermediate shaft, a pulley on the grinding-wheel spindle, belts connecting all pulleys, and belt-tension-adjusting screws in each of the yokes as described.

17. In a grinding-machine a motor attached to a shaft, a pulley sliding on said shaft, journaled to a bracket, said pulley having rollers to engage grooves in said shaft, whereby friction is eliminated so that said pulley may slide freely.

18. In a grinding-machine, a driving-shaft located on the rear side of the machine, said shaft adapted to drive a grinding-wheel mounted on a traversing carriage, yokes connecting said shaft with the grinding-wheel base, an intermediate shaft having pulleys located at the connection of the yokes, belts for transmitting motion to the grinding-wheel, said yokes serving to remove pressure due to power transmission on the sliding bearings of carriage and wheel-slide and keeping the belts under tension in all positions of the grinding-wheel slide.

19. In a grinding-machine, a carriage, a grinding-wheel and its support mounted thereon, a bracket mounted on said carriage, a pulley journaled in said bracket, said pulley sliding upon a driving-shaft, said shaft located on the rear of the machine and below the said carriage, a yoke attached to the

grinding-wheel support, and a yoke attached to said bracket where said pulley is journaled, the yokes connecting and operating at approximate right angles with each other, a shaft at the connection of the two yokes, pulleys mounted on said shaft and belting connecting said sliding pulley with said grinding-wheel-spindle pulley.

In witness whereof I have hereunto set my hand and seal, at Waynesboro, Pennsylvania, this 2d day of September, A. D. 1901.

ABRAHAM B. LANDIS. [L. S.]

Witnesses:

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ALF. N. RUSSELL.