(No Model.)

2 Sheets—Sheet 1.

J. DU BOIS.

LATHE FOR TURNING WHEELS.

No. 306,723. Patented Oct. 21, 1884.

Fig. 1

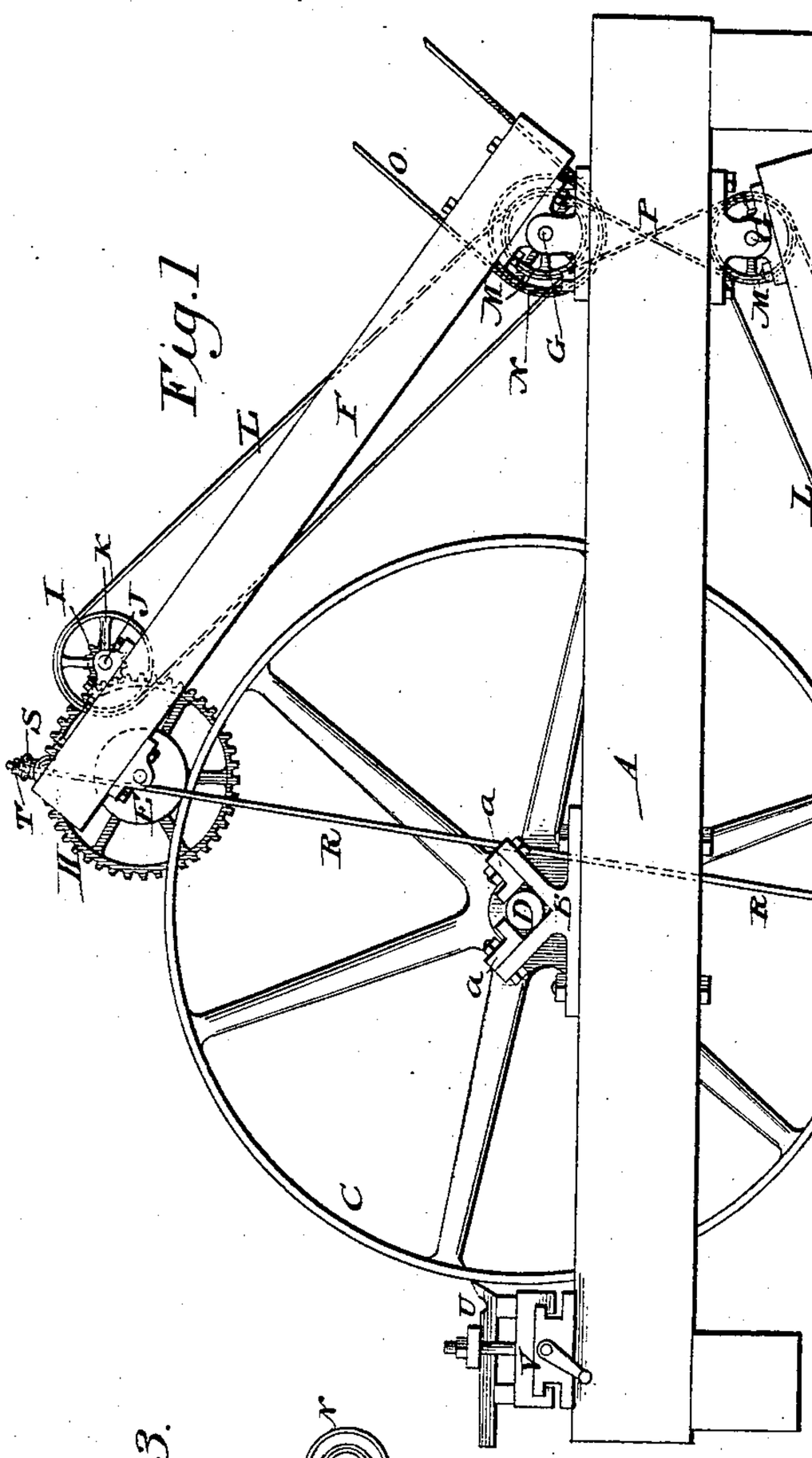


Fig. 2.

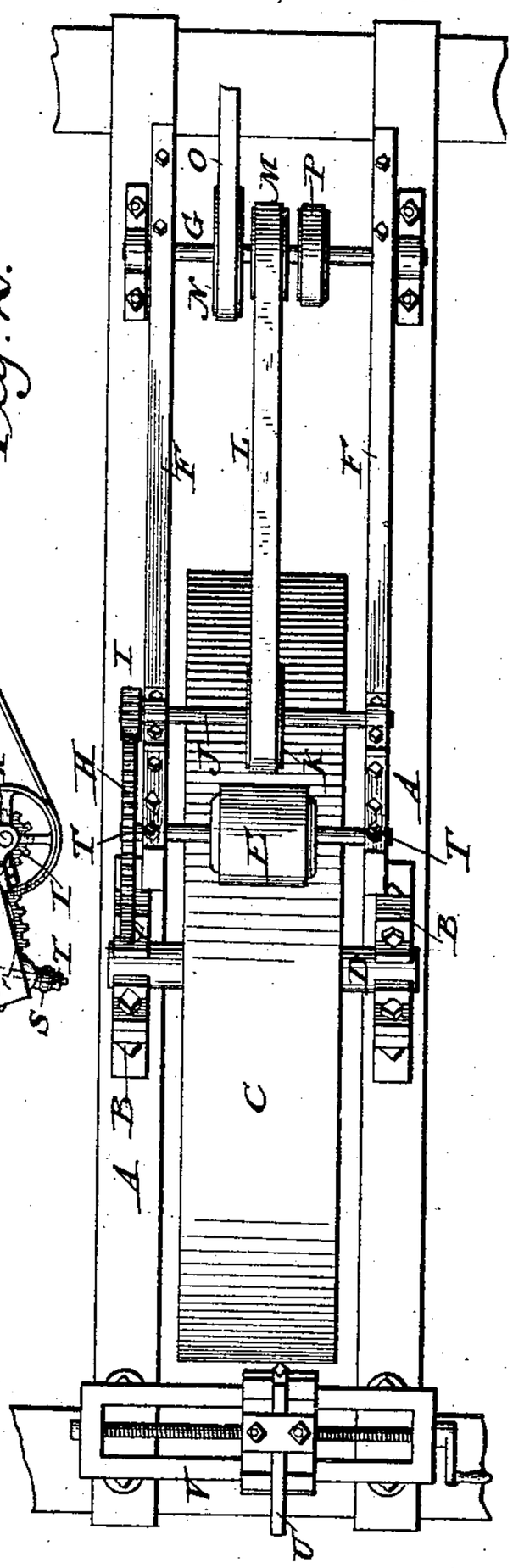


Fig. 3.

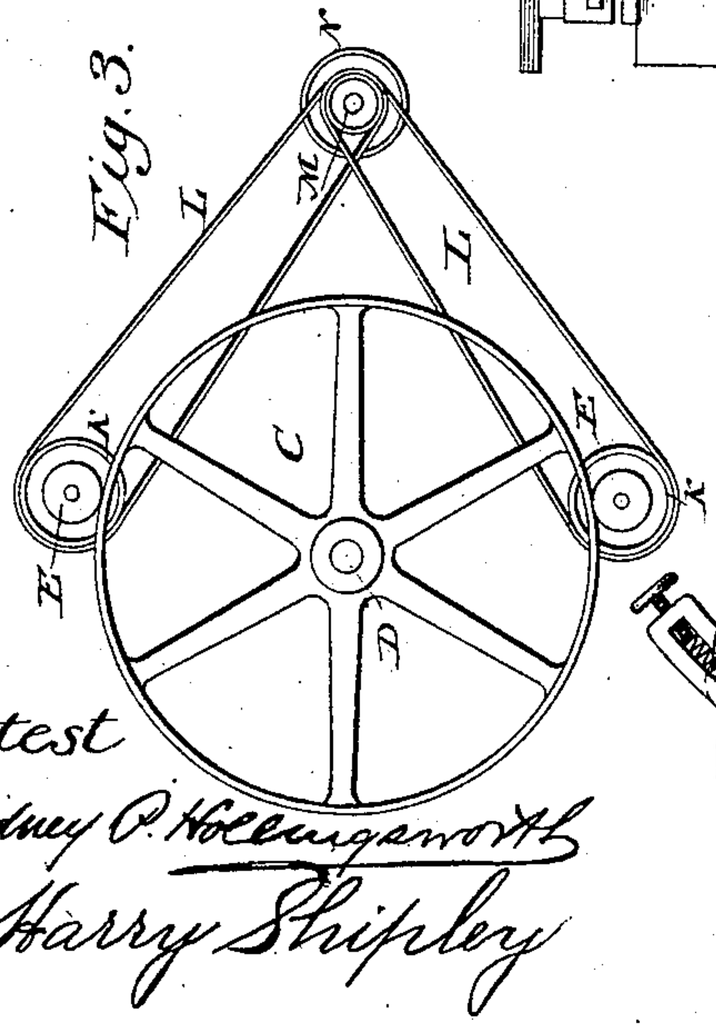
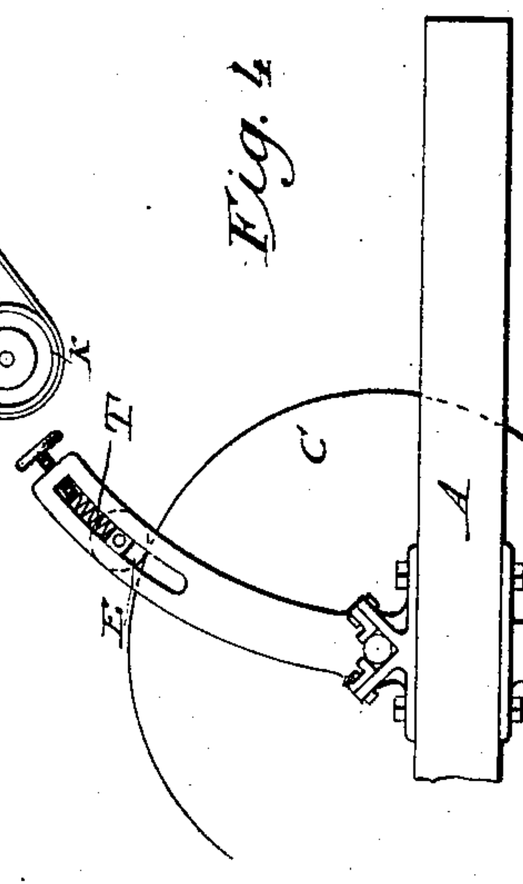


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

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LATHE FOR TURNING WHEELS.

No. 306,723. Patented Oct. 21, 1884.

Fig. 4.

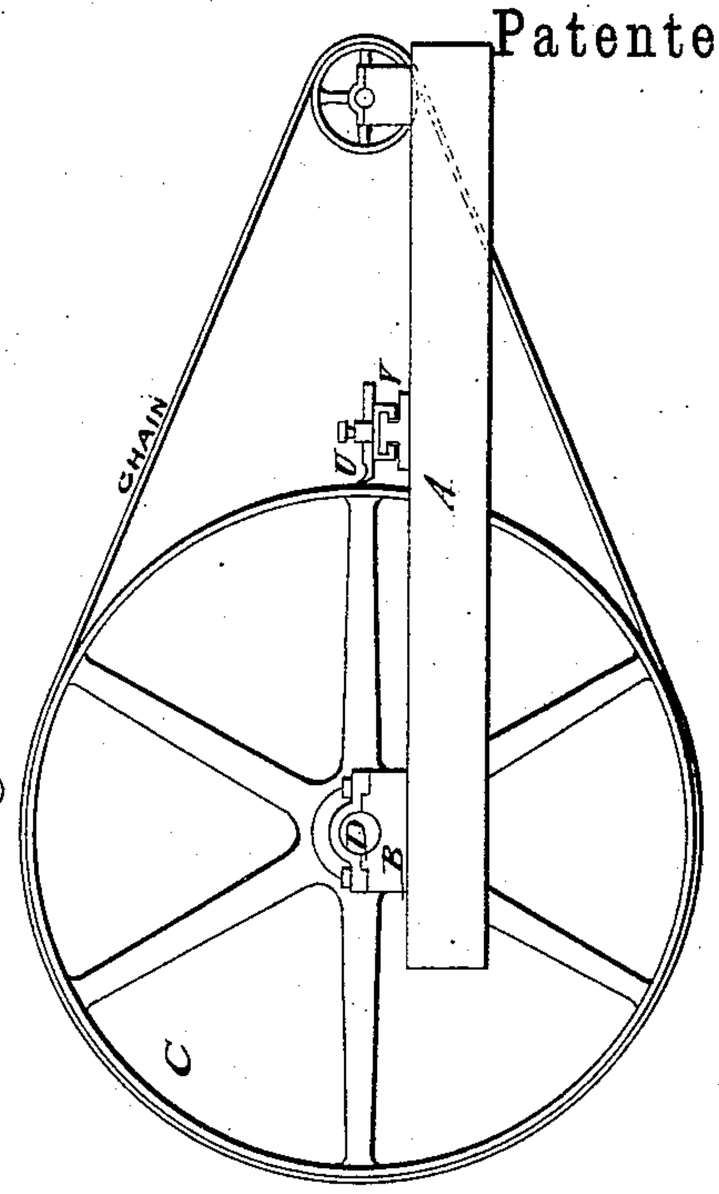


Fig. 6.

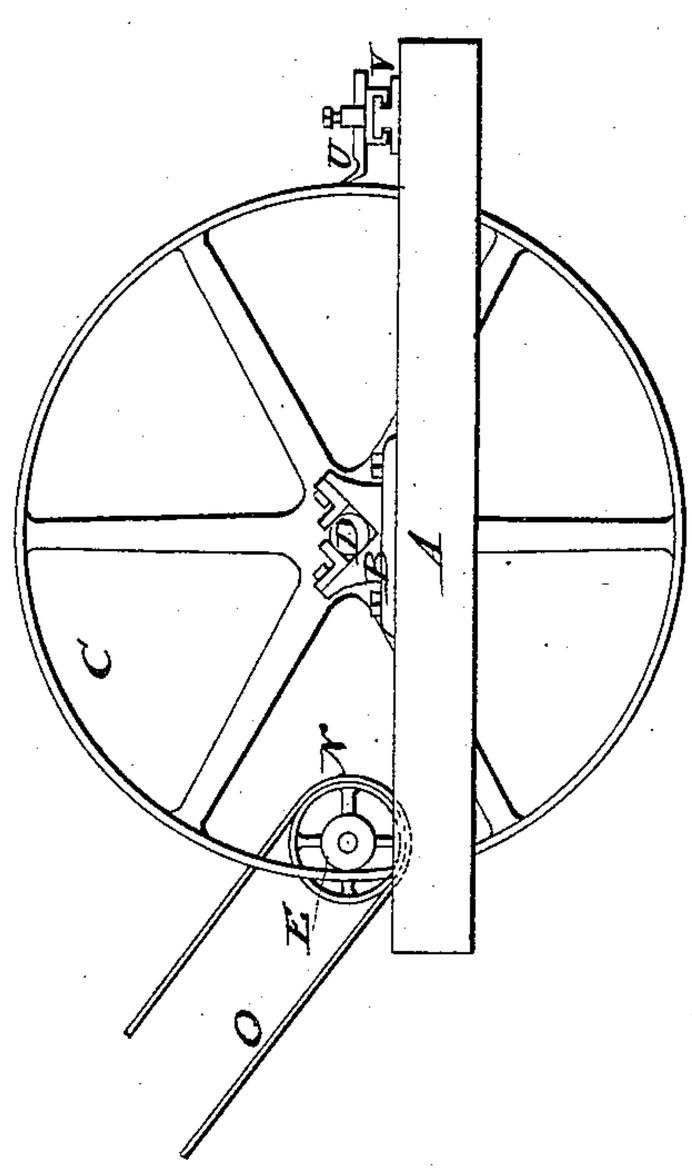
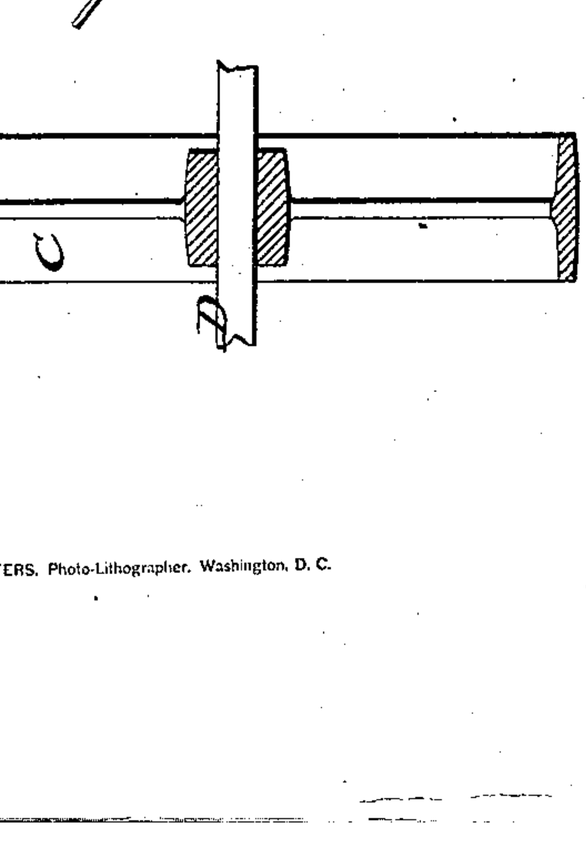


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN DU BOIS, OF DU BOIS, PENNSYLVANIA.

LATHE FOR TURNING WHEELS.

SPECIFICATION forming part of Letters Patent No. 306,723, dated October 21, 1884.

Application filed December 27, 1882. Renewed July 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN DU BOIS, of Du Bois, in the county of Clearfield and State of Pennsylvania, have invented certain Improvements in Methods of and Lathes for Turning Wheels, of which the following is a specification.

The object of my invention is to provide means for turning the faces and boring the hubs of wheels and pulleys of large diameter without the employment of the expensive and cumbrous machinery now in general use for that purpose.

With this end in view the invention consists, mainly, in an arrangement of devices for supporting the wheel and rotating the same by means of driving-pulleys, belts, or equivalent frictional devices acting upon its periphery.

It further consists in various details of construction, which will be hereinafter fully explained.

Referring to the accompanying drawings, Figure 1 represents a side elevation of a machine constructed on my plan, with the pulleys to be turned in position therein. Fig. 2 represents a top plan view of the same. Fig. 3 is a diagram illustrating a modified arrangement of the parts. Fig. 4 is a view illustrating a modified arrangement for sustaining the friction-pulleys. Fig. 5 is a view illustrating the friction-pulleys arranged to act upon the edges of the wheel to be turned. Fig. 6 is a view illustrating the driving-pulleys arranged to act upon the inside of the rim. Fig. 7 is a view illustrating the manner of driving the wheel to be turned by means of belts or chains.

In proceeding to construct the machine in its preferred form with driving-pulleys I first provide a rigid horizontal frame, A, which may be of any suitable material and in any suitable form, provided only that it contains a central opening to admit the wheel which is to be turned, and is adapted to sustain the various working parts of the machine, hereinafter described. On the two sides of this base-frame, in line with each other, I mount journal-boxes B, designed to receive and support the shaft or journal of the wheel to be turned. This wheel is shown at C in the drawings, with its shaft or journal D sustained in the boxes.

For the purpose of securing the journals of the wheel snugly in place, whatever their size, I provide two sides of each box with adjustable plates *a*, arranged to bear on top of the journals, as shown. These plates may be secured by means of bolts passing through slots, as shown, to admit of their adjustment; or they may be secured and adjusted in any other suitable manner, as by wedges, screws, or other equivalent devices familiar to those skilled in the art.

The construction of the boxes and the adjustable clamps thereon may be modified as desired, the only requirement being that the box shall be adapted to receive and sustain the shaft of the wheel, which latter is thus sustained in place within the frame and permitted to rotate freely therein.

For the purpose of driving the wheel I employ two friction-pulleys, E, arranged to act upon its rim on opposite sides of the center. These pulleys, which may be of wood, leather, or other material adapted to engage with the surface of the wheel, are mounted each upon a shaft supported in a swinging frame, F. The frames F have their rear ends connected by horizontal journals G to opposite sides of the main frame, this construction permitting their forward ends, which carry the friction-pulleys, to be moved to and from each other in order to admit wheels of different sizes between them.

For the purpose of imparting motion to the friction-pulleys E, I provide the shaft of each with a gear-wheel, H, and drive the latter by means of a pinion, I, upon a second shaft, J, also mounted upon the swinging frame. The shaft J is provided with a pulley, K, which receives motion through a belt, L, from a pulley, M, mounted upon and concentric with the journal around which the frame swings. This construction permits the frames to swing freely without interfering with the positive motion communicated to the friction-pulleys. Motion may be transmitted to the pulleys M in any suitable manner. It is preferred, however, to place an additional pulley, N, upon the shaft of the upper pulley, and to drive the same by means of the belt O, extending to the engine or other suitable motor. Motion is communicated from the upper pulley, M, to

its companion pulley below by means of a crossed belt, P, carried around pulleys upon the respective shafts, as shown.

In order to secure the required friction of the driving-pulleys E upon the rim of the wheel, it is necessary to hold them firmly against the same. This may be accomplished by various devices, but it is preferred, as shown in the drawings, to connect the free ends of the two swinging frames F by means of a rod, R, secured to one of the frames, passed loosely through the other and through an elastic washer or spring, S, thereon, with a nut, T, upon the upper end. In this manner the two frames are drawn toward each other with a yielding or elastic pressure against opposite sides of the wheel, being caused to engage the same with sufficient firmness to drive it steadily and positively against the resistance of the tool employed to act thereon. The connection of the frames with each other is peculiarly advantageous in that the pressure of one is counteracted by that of the other, thus avoiding the great side strain and friction which would otherwise be applied to the journal of the pulley.

While it is preferred to employ the two friction-pulleys upon opposite sides of the wheel, as shown, good results may be obtained in turning light pulleys by the use of a single friction-pulley acting upon one side of the wheel. The cutting or finishing of the surface of the wheel is effected by means of a tool, U, mounted in an ordinary slide-rest, V, supported upon the main frame, as shown in Fig. 1.

In operation the pulley to be finished is mounted in the main frame, as shown, with its journals resting in the boxes B, and with the two friction-pulleys E bearing upon its face on opposite sides of the center. The nut T being adjusted until the pulleys bear with the required degree of friction upon the wheel, the machine is set in motion, whereupon the friction-pulleys communicate to the rim or periphery of the wheel a steady and positive motion, causing its surface to be carried past the cutting-wheel at a uniform speed and without the chattering or tremulous motion commonly experienced in the use of machines which drive the wheel from the center.

The great advantage of my machine as regards its mode of action is due to the fact that the power to turn the wheel is applied at the periphery instead of at the center.

While it is preferred to hang the two frames at different points or upon different centers, they may, if desired, be hung upon a common center, as represented in Fig. 3. In such case the driving-belts L may be extended directly from the pulley M, mounted on said shaft, to the pulleys for driving the friction-wheels, as represented.

Fig. 4 represents still another method of sustaining the friction-pulleys. In this case the pulleys are supported in slides arranged to move in the main frame, instead of being sustained by the swinging arms, as in the previous case, this support being in most respects an equivalent of the swinging frames. This figure also illustrates a modified arrangement for applying pressure to the friction-pulleys, the boxes by which the pulley-journals are carried being subjected to the action of springs T, bearing one upon each box and adjustable independently of each other by compression-screws.

Fig. 5 represents an arrangement of the frictional driving-pulleys to act upon the edges or side faces of the periphery of the wheel to be turned. The wheel will be sustained in supports, as represented in the preceding figures, and the friction-pulleys E arranged, as shown, to act upon the opposite sides or edges of the wheel at its periphery. The shafts bearing the friction-pulleys may be mounted in any suitable manner.

Referring to Fig. 6, the arrangement therein shown represents the wheel sustained by a supporting-frame, as in the preceding figures. The friction driving-pulleys are, however, arranged to act upon the inner surface of the rim of the wheel, instead of upon the outer surface.

Referring to Fig. 7, the wheel is sustained by a frame similar to that before described; but in place of the frictional pulleys E, arranged to act upon the rim of the wheel, I employ an endless belt or chain, E, passed around the outside of the wheel to be turned, and thence around a driving-pulley located at a suitable distance therefrom. The belt thus applied imparts motion directly and positively to the wheel.

It will be observed, as a peculiarity of my system, that the driving-power is in each and every case applied at the outer edge or periphery of the wheel to be turned, instead of being applied through a central shaft, or through a face-plate, to which the wheel is bolted, as usual. This feature of applying the power directly to the wheel which is to be finished, and at the outer portion of the same, constitutes the fundamental feature of my improvement.

I am aware that in a machine for grinding the side faces of a circular-saw blade the rotation of the saw has been effected by the frictional engagement therewith of two rollers acting upon opposite faces, one of said rolls being movable to and from the other, and a grindstone being mounted in movable supports upon the frame, so that it is carried to and fro over the side face of the saw. To such arrangement I lay no claim.

Having thus described my invention, what I claim is—

1. In a lathe for turning the faces of wheels, the combination of the following elements: a frame provided with a central support for said wheel, two frictional driving-pulleys arranged to bear upon the face of said wheel on diametrically-opposite sides, means for imparting

rotation to said pulleys, and a fixed cutting-tool mounted in an adjustable support and adapted to be moved across the periphery of the wheel, substantially as described.

2. In a lathe for turning pulleys, the combination, with a cutting tool or chisel and a rest or support to adjust the same, of a frame provided with a central support for the wheel to be turned, and two frictional driving-pulleys, constructed and arranged substantially as described, to act upon the periphery of the wheel at diametrically-opposite points.

3. The combination, with the frame A and wheel-support B thereon, of the cutting-tool U, the rest V therefor, and the two swinging arms F, provided with the frictional pulleys E at their free ends, and means, substantially as described, for imparting a rotary motion to said pulleys.

4. In a lathe for turning pulleys, the combination of the following elements: the frame provided with a support for the axis of the pulley, a cutting-tool, and an adjustable rest or support therefor, and a frictional driving device, substantially as described, adapted to bear upon the outer edge or periphery of the wheel, substantially as described.

5. In a lathe for finishing the periphery of wheels, a cutting-tool to act upon the circumference of the wheel, and a frictional driving mechanism adapted and arranged to encircle or act upon the wheel on both sides of the cutting-tool.

6. In a lathe for finishing the circumference of wheels, two frictional driving-pulleys adapted and arranged to act at diametrically-opposite points on the circumference, each pulley being provided with supporting devices, substantially as described, whereby it is enabled to move to and from the wheel independently of its companion.

7. In a lathe for finishing the circumference of wheels, two frictional driving devices adapted to engage the periphery of said wheel, the two devices being movable independently of each other.

8. In a lathe for turning wheels, the combination of a frame provided with a central support for said wheel, the two friction-pulleys, the swinging arms giving support thereto, and the connecting-rod and spring uniting said arms, substantially as described.

JOHN DU BOIS.

Witnesses:

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NEWTON WYCKOFF.