No. 610,036. Patented Aug. 30, 1898.

G. A. ENSIGN.

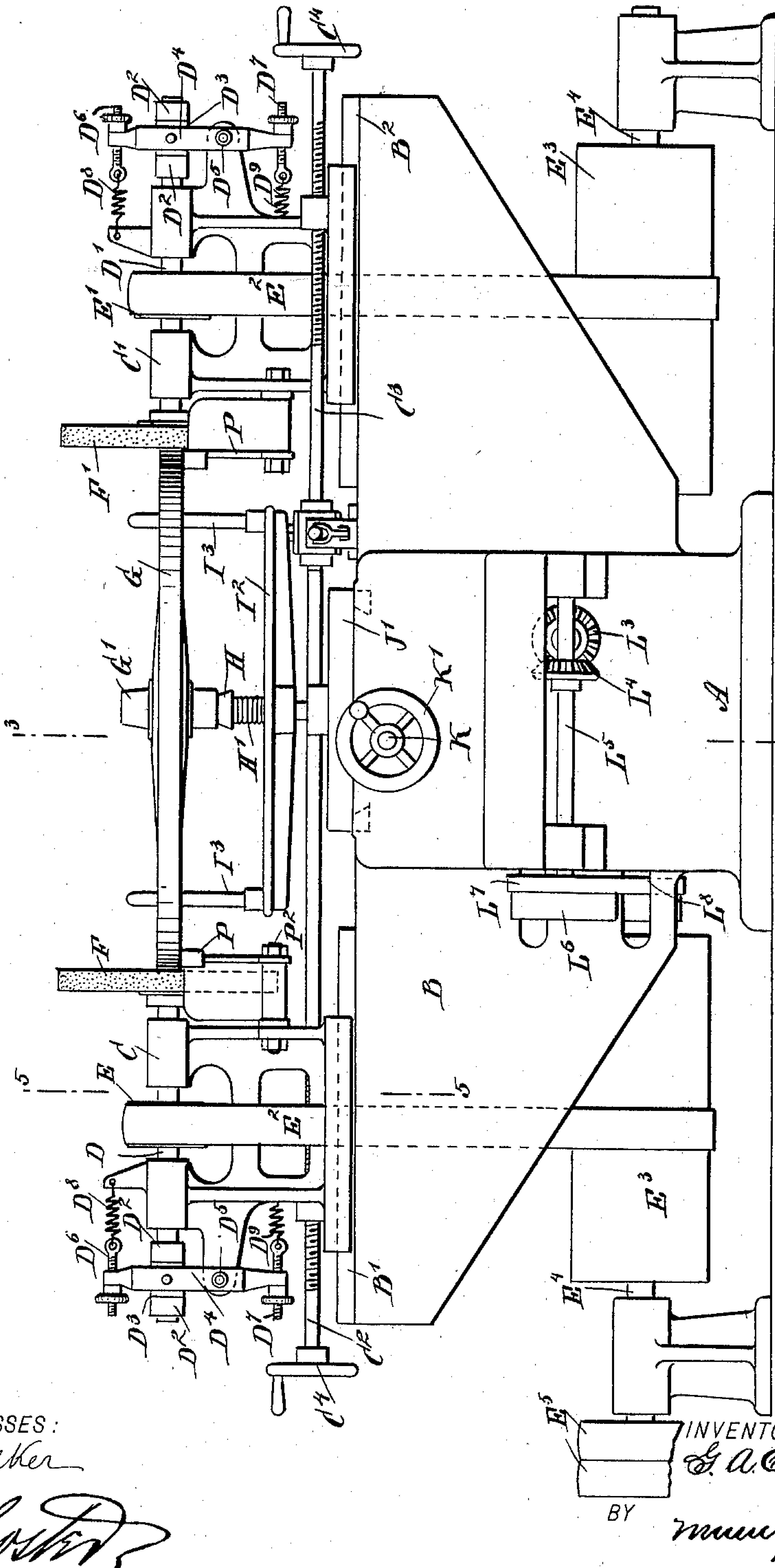
TREAD SANDING MACHINE.

(Application filed Aug. 31, 1897.)

(No Model.)

3 Sheets—Sheet I.

Fig. 1



WITNESSES:
H Walker
Geo. G. Hoster

INVENTOR
G. A. Ensign.
BY
Munn & Co
ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 610,036.

Patented Aug. 30, 1898.

G. A. ENSIGN.

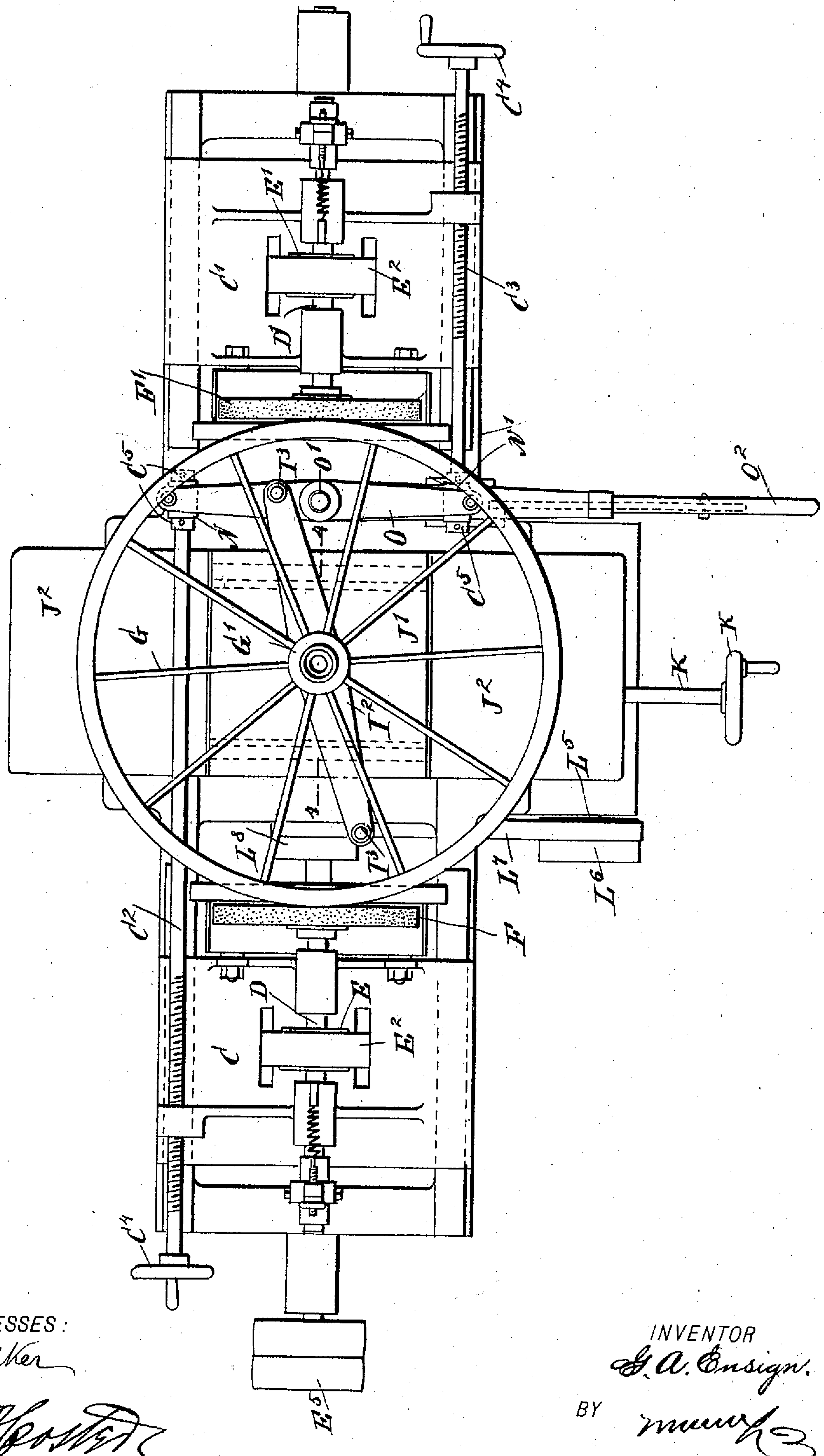
TREAD SANDING MACHINE.

(Application filed Aug. 31, 1897.)

(No Model.)

3 Sheets—Sheet 2.

Fig 2



WITNESSES:
H Walker
Geo. G. Hoster

INVENTOR
G. A. Ensign.
BY Munn & Co
ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 610,036. Patented Aug. 30, 1898.

G. A. ENSIGN.

TREAD SANDING MACHINE.

(Application filed Aug. 31, 1897.)

(No Model.)

3 Sheets—Sheet 3.

Fig 3

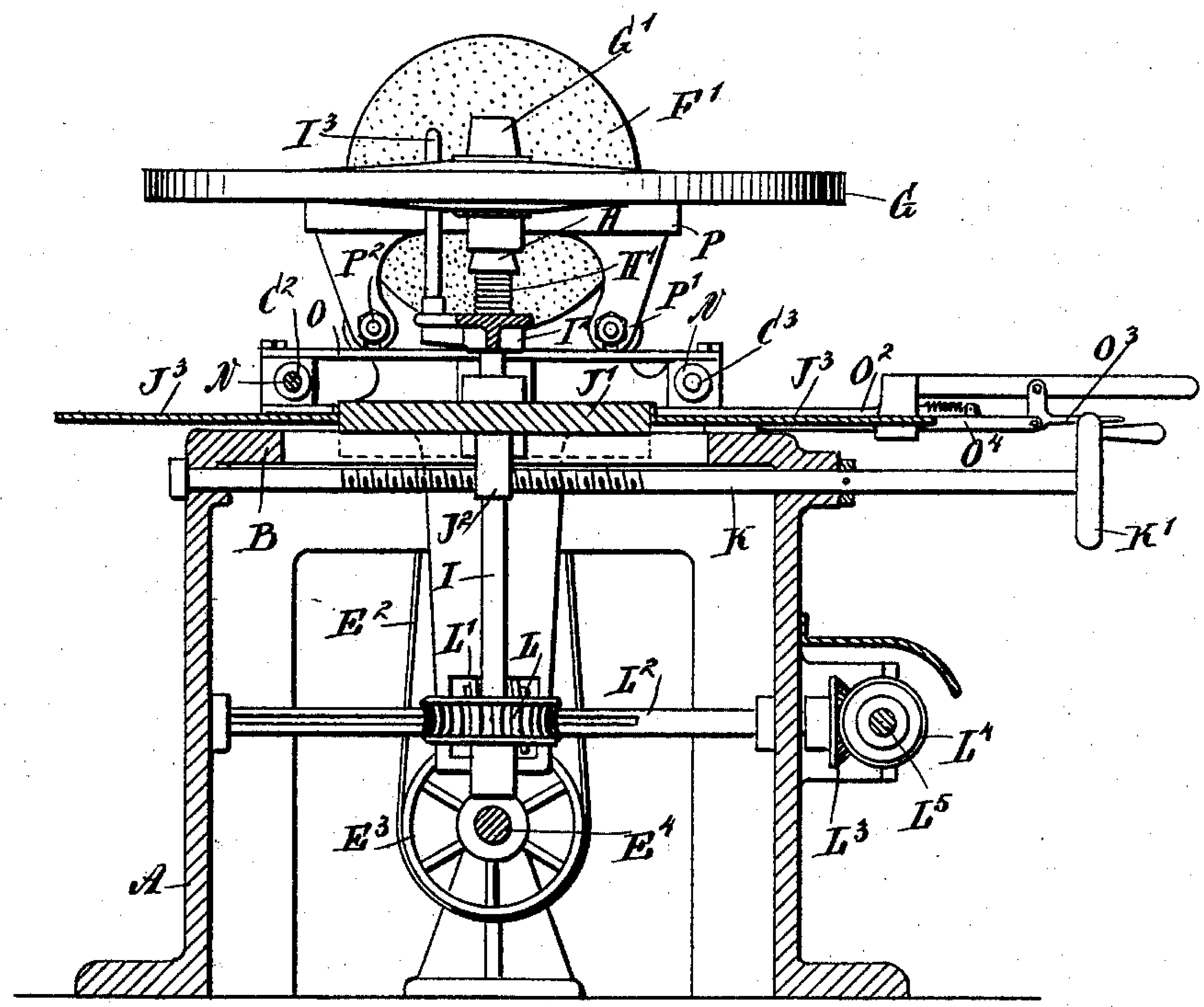


Fig 4

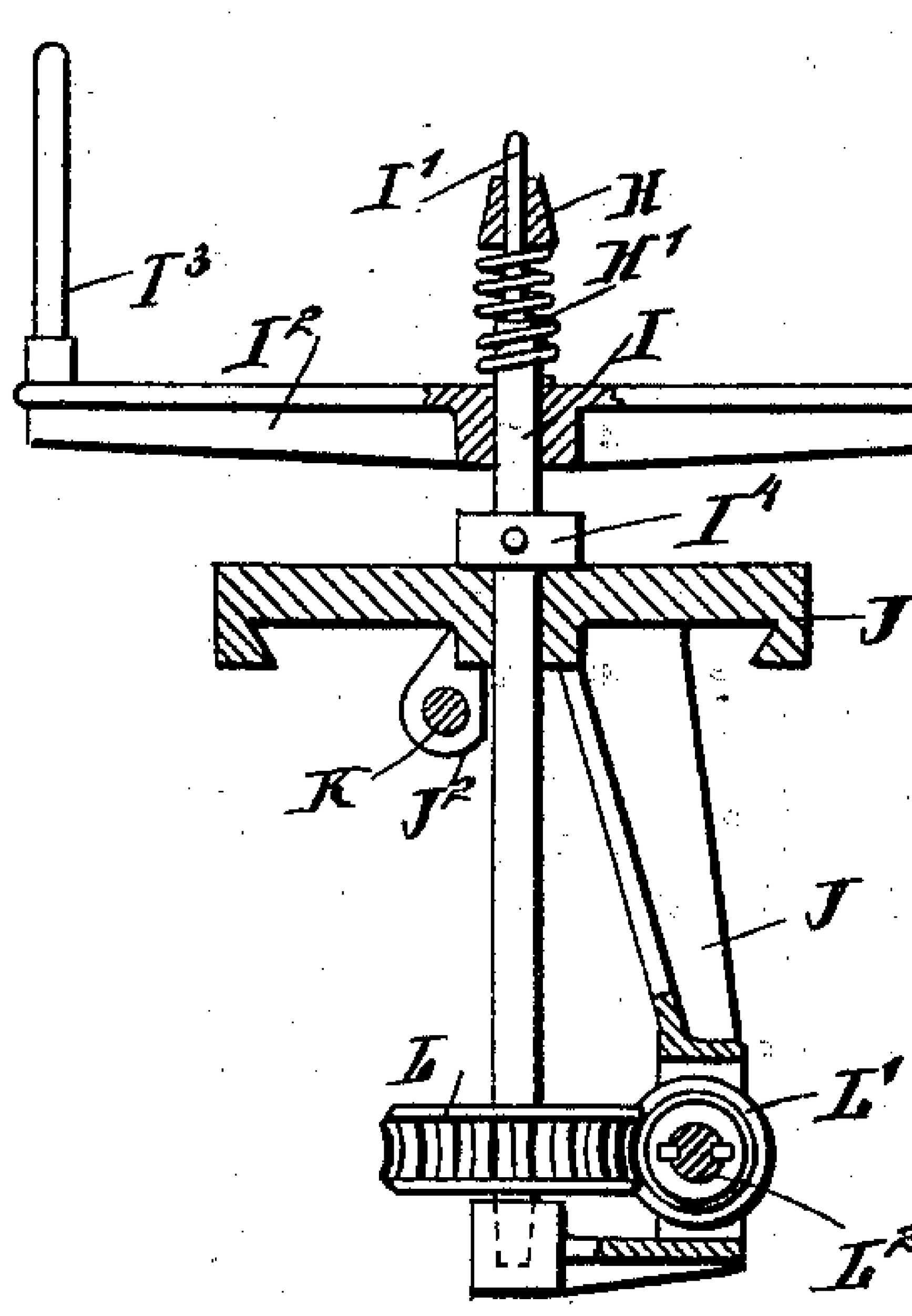
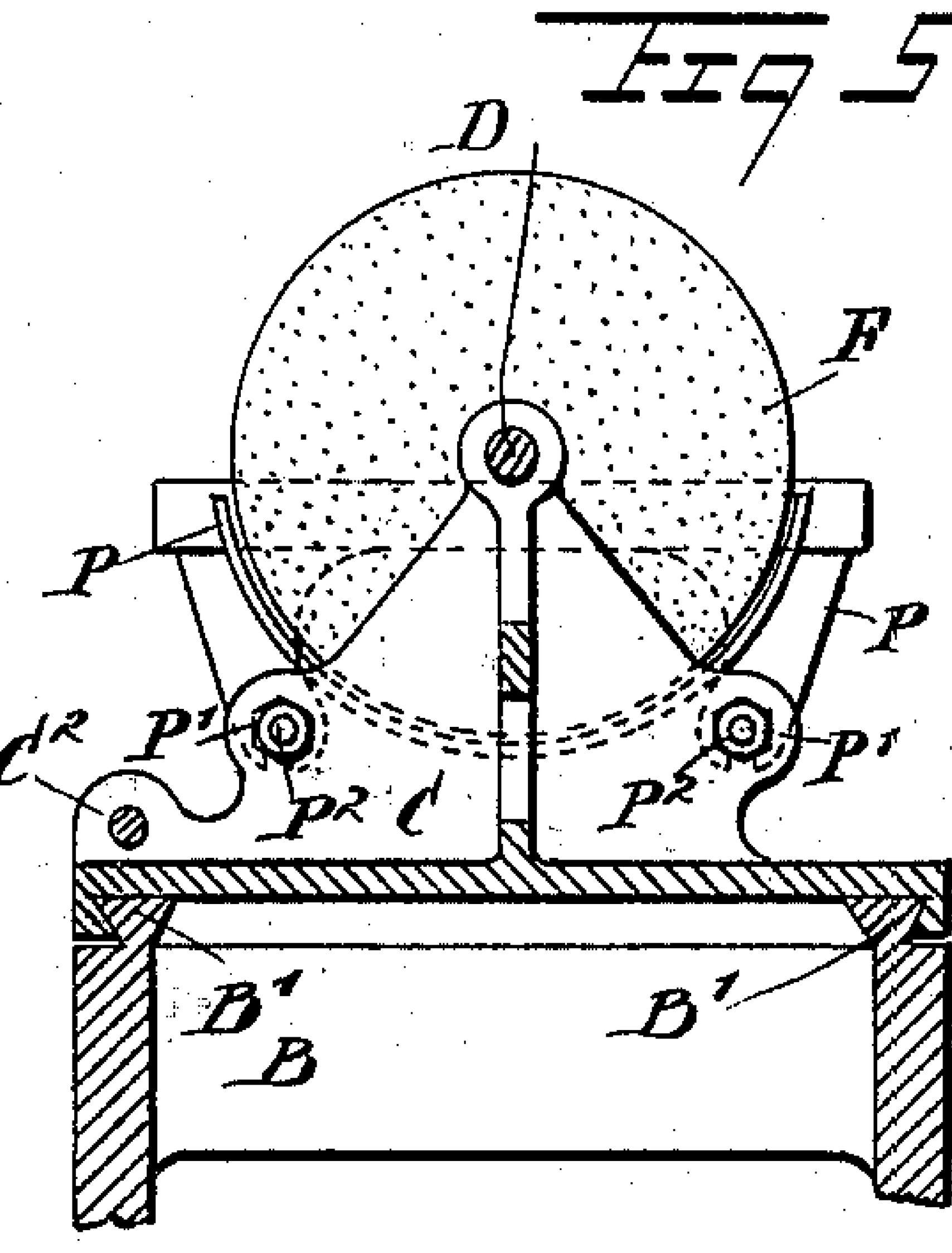


Fig 5



WITNESSES:

H. Walker

Fred G. Foster

INVENTOR

G. A. Ensign.

BY Munn & Co

ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE A. ENSIGN, OF DEFIANCE, OHIO, ASSIGNOR TO THE DEFIANCE MACHINE WORKS, OF SAME PLACE.

TREAD-SANDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 610,036, dated August 30, 1898.

Application filed August 31, 1897. Serial No. 650,175. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. ENSIGN, of Defiance, in the county of Defiance and State of Ohio, have invented a new and Improved Tread-Sanding Machine, of which the following is a full, clear, and exact description.

The invention relates to machines for truing and smoothing the treads of wooden vehicle-wheels; and its object is to provide a new and improved tread-sanding machine which is simple and durable in construction, very effective in operation, and arranged to enable the operator to perfectly smooth the tread of a wheel and render its peripheral surface square to the plane of the wheel.

The invention consists principally of oppositely-arranged abrading-faces, between which the tread to be acted upon is adapted to pass, and a revoluble spindle for supporting and carrying the vehicle-wheel and holding it between the said faces.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a plan view of the same. Fig. 3 is a transverse section of the same on the line 3 3 in Fig. 1. Fig. 4 is a transverse section on the line 4 4 of Fig. 2 of the wheel supporting and revolving device; and Fig. 5 is a transverse section of part of the improvement on the line 5 5 in Fig. 1.

On a suitably-constructed stand A is arranged a bed-plate B, formed near its ends with longitudinally-extending guideways B′ B^2, on which are fitted to slide head-stocks C C′, respectively, in which are journaled spindles D D′, respectively, carrying abrading wheels or disks F F′, respectively, having their faces located opposite each other, as plainly indicated in the drawings. On the said spindles D D′ are secured pulleys E E′, respectively, each engaged by a belt E^2, passing over a pulley E^3, secured on a longitudinally-extending driving-shaft E^4, journaled in the lower portion of the stand A and in suitable extra bearings, as is plainly indicated in Fig. 1.

On one outer end of the shaft E^4 are secured fast and loose pulleys E^5, connected by a belt with other machinery for imparting a rotary motion to the shaft E^4, and by the pulleys E^3, belts E^2, and pulleys E E′ to the spindles D D′, so as to rotate the same and the abrading-disks F F′. Between the oppositely-arranged faces of the said disks F F′ is adapted to pass in a transverse direction the horizontally-disposed vertical wheel G under treatment, the said wheel having its hub G′ fitted at its lower end upon a cone H, held loosely on the upper reduced end I′ of a spindle I, the said cone being supported by a spring H′, having its lower end resting on an arm I^2, secured to the spindle I, and provided with pins I^3, extending upwardly and passing between the spokes of the wheel G to rotate the latter when the spindle I is revolved. The spindle I is journaled in suitable bearings in a saddle J, having its top plate J′ fitted to slide in suitable bearings arranged transversely on the top of the stand A between the bearings B′ B^2 of the bed-plate B. A collar I^4 is secured on the spindle I and rests on the upper surface of the top J′, so as to hold the spindle in proper position. Lateral adjustment is given to the saddle J by means of a screw-rod K, screwing in a nut J^2, attached to the saddle J, as plainly indicated in Fig. 4, the said screw-rod extending through the front of the stand A to carry at its outer end a hand-wheel K′, under the control of the operator, for turning the screw-rod K and moving the saddle J transversely according to the direction in which the hand-wheel K′ is turned, it being understood that the screw-rod is journaled in suitable bearings in the stand A, as is plainly indicated in Fig. 1.

The top J′ of the saddle J is provided with protecting-flanges J^3, for preventing the abraded material from passing into the stand A and to the working parts contained therein.

On the lower end of the spindle I is secured a worm-wheel L, in mesh with a worm L′, mounted to slide on and turn with a transversely-extending shaft L^2, journaled in suitable bearings in the stand A. (See Figs. 3 and 4.)

On the outer end of the shaft L^2 is secured a beveled gear-wheel L^3, in mesh with a beveled gear-wheel L^4, attached to a longitudinally-extending shaft L^5, journaled on the front of the stand A. On one end of this shaft L^5 is secured a pulley L^6, over which passes a belt L^7, also passing over a pulley L^8, secured on the shaft E^4, previously mentioned, so that when the latter is rotated a rotary motion is transmitted by the pulleys L^8 L^6 and the belt L^7 to the shaft L^5, which by the beveled gear-wheels L^4 L^3 imparts a rotary motion to the shaft L^2, so that the worm L' rotates the worm-wheel L, and consequently the spindle I, which by the pins I^3 imparts a rotary motion to the wheel G under treatment.

The head-stocks C C′ are engaged by screw-rods C^2 C^3, respectively provided at their outer ends with hand-wheels C^4, under the control of the operator, for turning the said screw-rods in the nuts of the said head-stocks to adjust the latter relatively to the abrading-disks F F′ for the purpose of bringing the inner ends of the disks F F′ a suitable distance from the inner ends of the adjacent bearings of the head-stocks, so as to allow the spindles D D′ to slide longitudinally in their bearings.

The inner ends of the screw-rods C^2 C^3 are each provided with collars C^5, between which are held loosely blocks N N′, respectively pivotally connected with the ends of a lever O, fulcrumed at O′ on the top of the stand A, as is plainly indicated in the drawings. One end of the lever O is provided with a handle O^2, carrying a hand-lever O^3 for manipulating a spring-pressed catch O^4 and locking the said handle in position when standing in a transverse position, as illustrated in Figs. 1, 2, and 3, the said catch engaging a corresponding recess on the stand A.

Now it will be seen that when the operator presses the hand-lever O^3 the handle O^2 and the lever O are unlocked, and the operator can now swing the handle O^2 to the right to impart a swinging motion to the lever O and shift the screw-rods C^2 and C^3 outwardly in opposite directions to move the head-stocks C C′ in a like direction and the abrading-disks F F′ apart, so as to allow of conveniently passing the wheel G between the opposite faces of the said disks.

In order to give the desired tension to the spindles D D′, I provide each of the latter with the following device: On the outer end of each spindle D or D′ are secured collars D^2, between which are held loosely a block D^3, engaged by a vertically-disposed lever D^4, fulcrumed at D^5 to a bracket projecting from the corresponding head-stock C or C′. The upper and lower ends of the lever D^4 carry screw-rods D^6 D^7, engaged by springs D^8 D^9, attached to the head-stock C or C′, the said screw-rod serving to adjust the tension of the springs, and consequently the pressure on the lever D^4 and the spindles D D′.

The wheel G is supported at its felly by supporting-arms P, fastened with their lower forked ends P′ on bolts P^2, carried by the head-stocks C C′, this arrangement allowing of adjusting the arms vertically, according to the thickness of the felly, to support the latter approximately centrally between the disks F F′—that is, in alinement with the spindles D D′.

The operation is as follows: In using the machine for a certain sized wheel G the operator first turns the screw-rods C^2 C^3 to make the distance between the faces of the abrading-disks F F′ about one-fourth of an inch less than the diameter of the wheel G to be operated upon, the lever O being then in the locked position shown in Figs. 1 and 2. When this has been done, the operator unlocks the lever O and swings the same to the right, so as to shift the head-stocks C C′ outwardly in opposite directions. A wheel G is now placed on the spring-pressed cone H, so that the arms or pins I^3 extend between the spokes of the wheel. The operator now moves the lever O back into its former position (shown in Figs. 1 and 2) and locks it therein by the catch O^4, as previously explained. The rotary motion now given to the spindles I D D′ causes a revolving of the wheel G and the abrading-disks F F′, so that the tread of the wheel is acted upon uniformly by the vertically-disposed faces of the abrading-disks, and consequently the tread is smoothed and is made perfectly square to the plane of the wheel. When this has been done, the operator moves the lever O again to the right to bring the head-stocks C C′ into an outermost position and the abrading-disks out of contact with the wheel, after which the wheel is removed and another wheel placed in position. The above-described operation is then repeated—that is, the lever is again moved into a closed position to bring the abrading-disks in contact with the tread of the wheel.

By having the tension device on each end of a spindle D or D′, I am enabled to give any desired amount of tension within the power of the springs D^8 D^9 to the said spindle to allow the same to yield longitudinally in the head-stock.

The coil compression-spring H′ of the centering-cone H is of such strength as to exert a pressure against the wheel equaling approximately one-half the weight of the wheel. Now should there be a hump on the wheel, or the wheel be out of round, it causes the abrading-disks to exert a little more influence on the tread of the wheel than was originally intended, owing to the fact that the wheel does not fit the spindle, but is centered on the cone.

It will be seen that by having the worm L′ turning with and sliding on the shaft L^2 any desired transverse motion can be given to the saddle J without moving the worm L′ and worm-wheel L out of mesh.

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

1. A tread-sanding machine, comprising two head-stocks having their shafts in the same straight line and adjustable toward and from each other, abrading-disks upon the adjacent ends of the shafts and a wheel-support provided with feeding mechanism for moving the same between the disks in a plane parallel with the plane of the wheel and the shafts of the abrading-disks, substantially as described.

2. A tread-sanding machine, comprising two head-stocks having their shafts in line and adjustable toward and from each other, abrading-disks upon the adjacent ends of the shafts and a wheel-support provided with feeding mechanism for moving the same between the disks and parallel with the plane of the wheel and the shafts of the abrading-disks, and means for revolving the wheel upon its axis during said transfer, substantially as described.

3. A tread-sanding machine, comprising two head-stocks having their shafts in line and adjustable toward and from each other, abrading-disks upon the adjacent ends of the shafts and a wheel-support provided with feeding mechanism for moving the same between the disks and in the direction of the plane of the wheel, and rim-supports attached to the head-stocks and engaging the under surface of the wheel-rim, substantially as described.

4. A tread-sanding machine provided with slidable head-stocks, spindles journaled in the said head-stocks, abrading-disks on the said spindles, and means for moving the said head-stocks simultaneously toward and from each other, substantially as shown and described.

5. A tread-sanding machine provided with slidable head-stocks, spindles journaled in the said head-stocks, abrading-disks on the said spindles, means for moving the said head-stocks simultaneously toward and from each other, and a tension device for each of the said spindles, to allow a longitudinal yielding of the spindles in their bearings in the head-stocks, substantially as shown and described.

6. A tread-sanding machine provided with a spindle, an abrading-disk on the spindle, and a tension device for the said spindle, to allow a longitudinal yielding of the spindle in its bearings, substantially as shown and described.

7. A tread-sanding machine provided with a spindle, an abrading-disk on the spindle, a tension device for the said spindle, to allow a longitudinal yielding of the spindle in its bearings, and an adjusting device for regulating the degree of tension on the said spindle, substantially as shown and described.

8. A tread-sanding machine provided with slidable head-stocks, spindles journaled in the said head-stocks, abrading-disks secured on the said spindles, screw-rods screwing in the said head-stocks, and a lever loosely connected with the said screw-rods, to permit of adjusting the head-stocks independently of each other upon turning the screw-rods, and of moving the head-stocks simultaneously upon imparting a swinging motion to the lever, substantially as shown and described.

9. A tread-sanding machine provided with slidable head-stocks, spindles journaled in the said head-stocks, abrading-disks secured on the said spindles, screw-rods screwing in the said head-stocks, a lever loosely connected with the said screw-rods, to permit of adjusting the head-stocks independently of each other upon turning the screw-rods, and of moving the head-stocks simultaneously upon imparting a swinging motion to the lever, and means for locking the said lever in place, substantially as shown and described.

10. A tread-sanding machine provided with a slidable yoke, a spindle journaled in the said yoke, an arm carried by the spindle and engaging the wheel so as to rotate the latter upon revolving the spindle, a worm-wheel carried by the said spindle, a worm in mesh with the worm-wheel, and a revoluble shaft with which turns the said worm, the latter being also free to slide on said shaft, substantially as described.

11. A tread-sanding machine, comprising two head-stocks mounted to slide toward and from each other, shafts therein extending in the direction of said motion and having abrading-disks upon their adjacent or inner ends, a wheel-support provided with feeding means for moving the same between the disks in the direction of the plane of the wheel, means for revolving the wheel upon its axis during said transfer and rim-supports attached to the head-stocks and adjustable in height, substantially as described.

12. A tread-sanding machine, comprising two head-stocks mounted to slide toward and from each other, shafts therein extending in the direction of said motion and having abrading-disks upon their adjacent or inner ends, a horizontal supporting-table mounted to slide across the axes of said disks and between them, a shaft mounted in said table and adapted to engage the wheel to support and rotate it, a worm-wheel upon said shaft, a fixedly-journaled shaft having a worm slidingly mounted thereon and engaging said gear and thrust or end supports for said worm mounted upon the work-supporting table, substantially as described.

GEORGE A. ENSIGN.

Witnesses:
GEORGE W. DEATRICK,
JOSEPH BAUER.