

No. 704,785.

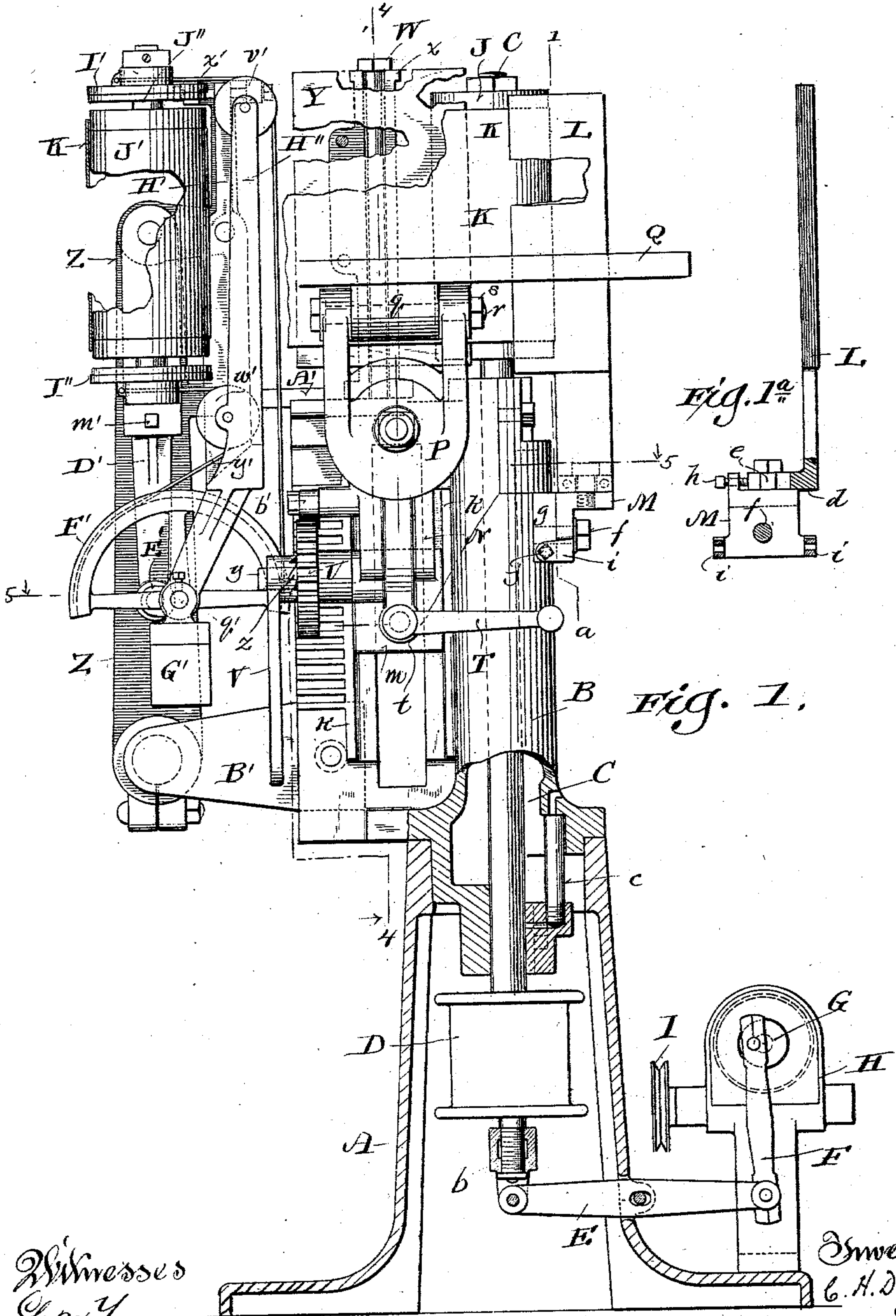
Patented July 15, 1902.

C. H. DRIVER.
SANDPAPERING MACHINE.

(Application filed Apr. 10, 1901.)

3 Sheets—Sheet 1.

(No Model.)



Witnesses
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3 Sheets—Sheet 3.

(No Model.)

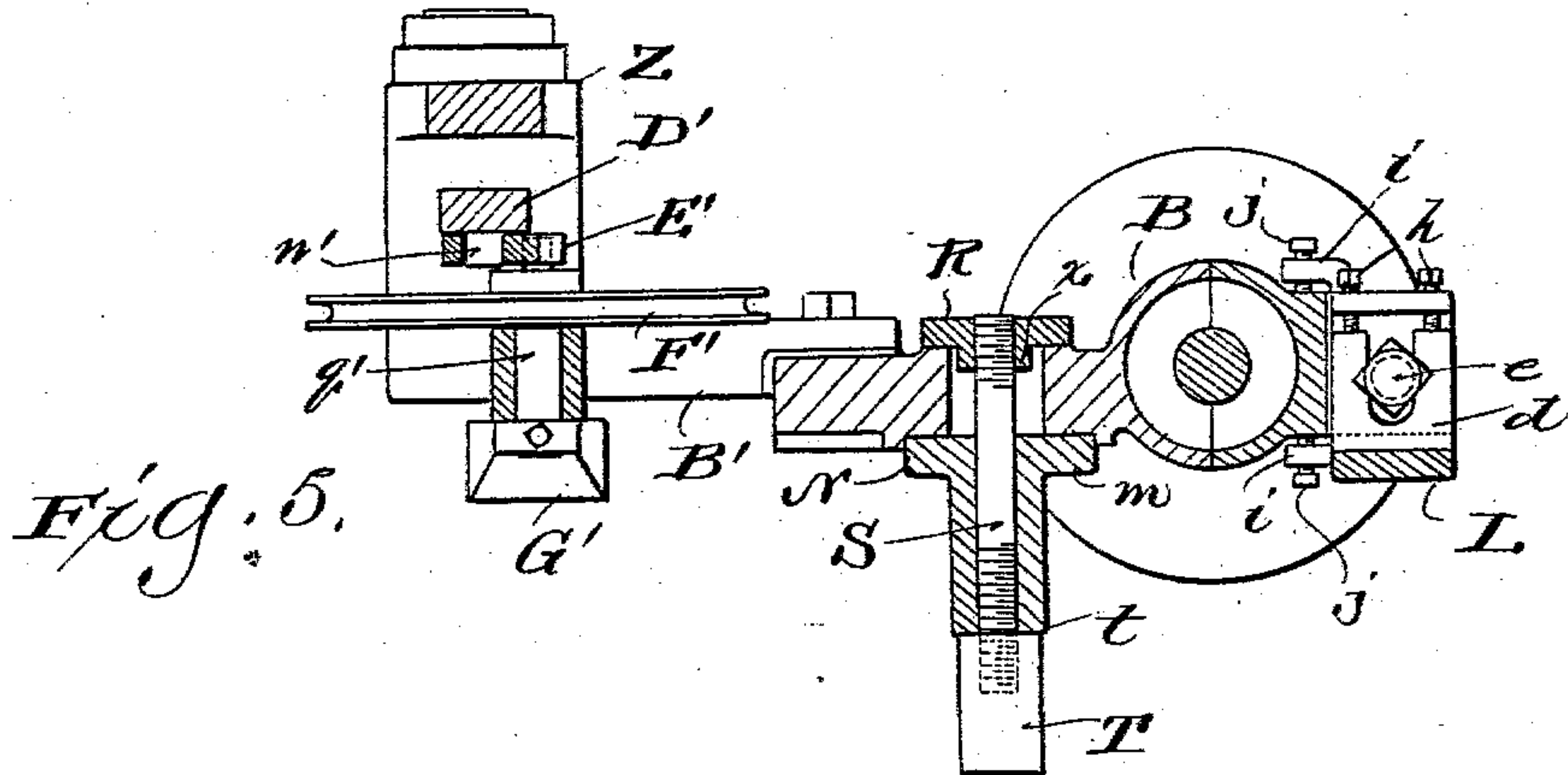
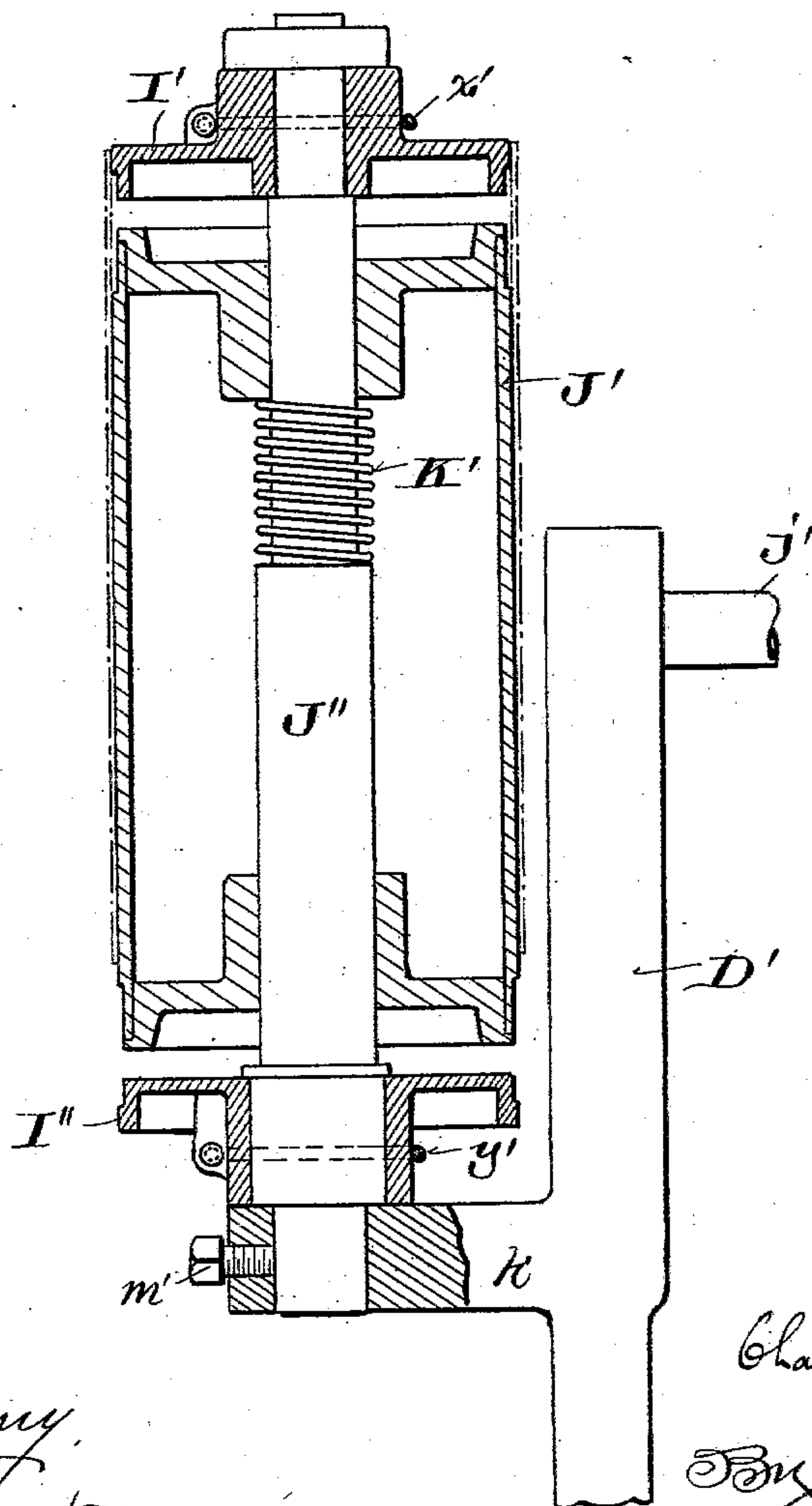


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES H. DRIVER, OF RACINE, WISCONSIN.

SANDPAPERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 704,785, dated July 15, 1902.

Application filed April 10, 1901. Serial No. 55,122. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. DRIVER, a citizen of the United States, and a resident of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Sandpapering-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to improve that class of sandpapering-machines set forth in my Patent No. 598,671, of February 8, 1898; and it consists in certain peculiarities of construction and combination of parts hereinafter particularly set forth with reference to the accompanying drawings and subsequently claimed.

Figure 1 of the drawings represents a side elevation of an improved sandpapering-machine in accordance with my invention, partly broken away and in section; Fig. 1^a, a detail sectional view indicated by line 1^a in the first figure; Fig. 2, a plan view of the machine with parts thereof in horizontal section; Fig. 3, an elevation of a portion of said machine, partly broken and in section; Fig. 4, an elevation of another portion of the aforesaid machine, partly in section, this view being indicated by lines 4 4 in the first figure; Fig. 5, a detail horizontal sectional view indicated by lines 5 5 in said first figure; and Fig. 6 a detail vertical sectional view illustrating the loose-pulley mechanism of the machine, this view being indicated by line 6 6 in Fig. 2.

Referring by letter to the drawings, A indicates a bell-shape casting constituting the base of my improved sandpapering-machine, and a partly-tubular standard B of the machine is in swivel connection with the upper end of said base. The tubular portion of standard B is provided with bearings for a vertical spindle C, and fast on the lower portion of this spindle is a pulley D for a drive-belt. Shown in screw-thread connection with the lower end of spindle C is a shackle b, in union with one end of a lever E, having loose-play fulcrum connection intermediate of its extremities with a slotted portion of base A, the other end of this lever being connected to a pitman F, that has union with a wrist of a disk G on an arbor that is supported by a housing-bracket H on the machine-base and worm-

geared to another arbor that is also supported by said bracket, this latter arbor being provided with pulley I for a power-belt. Because of its connection with the rocking lever E the spindle C has reciprocative motion imparted thereto, and, as shown in Fig. 1, provision is had for lubricating the lower bearing of said spindle, lubricant being introduced through a port in standard B to find its way down a pin c, arranged in a seat intercepted by a port leading to the bore of said bearing. Fast on the upper end of spindle C is the drive-pulley J for the abrading-belt K of the machine, the loose pulley J' for this belt being hereinafter particularly set forth. An abrading-cylinder may be substituted for the pulley J on spindle C, in which case the organization of the machine will not include loose pulley J', belt K, and mechanism hereinafter described in conjunction therewith, said spindle in either organization of said machine being rotary reciprocative or simply rotary, accordingly as lever E is rocking on its fulcrum or idle.

The organization herein shown embodies a gage-plate L for the material to be operated upon, a right-angle foot d of a shank of said plate being provided with a slot or recess longitudinally thereof engaged by a clamp-screw e, that turns in a bracket M, for which another clamp-screw f constitutes a pivot, the latter clamp-screw being run in a block g, constituting part of the tubular portion of standard B, facing said bracket. Set-screws h extend through an upper flange of bracket M to impinge the foot d of plate L and aid clamp-screw e in maintaining adjustment of said plate on said bracket. Ears i of the bracket M are engaged by set-screws j, that impinge edges of standard-block g to aid the clamp-screw f in maintaining adjustment of said bracket thereon. From the foregoing it will be appreciated that gage-plate L is not only pivotally adjustable with bracket M, but is also adjustable on said bracket in a direction to and from said belt.

The other than tubular portion of standard B is provided with a longitudinal slot open at its upper end, and facing this slot between guide-ribs k of the standard is the offset shank m of a bracket N, to which the disk end of a yoke P is connected by a bolt n to


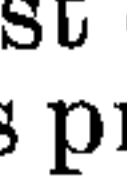

be pivotally adjustable, this yoke being clamped in adjusted position by a nut *p*, run on the bolt. The branches of yoke P and an intermediate block *q*, depending from the under side of work-table Q of the machine, are engaged by a pivot-bolt *r*, having a clamp-nut *s* run thereon. Owing to pivotal connection of yoke P with bracket N and like connection of table Q with said yoke it is obvious that said table may be set at various angles, this being an important feature of the machine.

Shank *m* of bracket N is provided with front lower studs *t u* at a right angle to each other, and a front strengthening-web *v* constitutes part of said bracket. A rear upper stud *w* of the bracket-shank *m* extends through the longitudinal slot of standard B, and bolted to this stud is a face-plate R, provided with an inner lower boss *x*, that also engages said recess. A pin S, extending through bracket-stud *t* and adjacent standard-slot, has one screw-threaded end thereof engaged with the boss portion of face-plate R, and run on the other screw-threaded end of the pin is the nut extremity of a crank T, this extremity of the crank being in opposition to said bracket-stud. The plate R, pin S, and crank T constitute a clamp by which the bracket N and work-table Q in connection with said bracket are held in vertically-adjustable connection with the machine-standard. The standard being in swivel connection with base A, the former and mechanism therewith may be turned at any time without stopping the machine to accommodate feed of material to the abrading device from any direction, this being also an important feature of my invention.

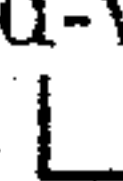
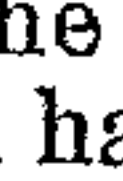
Arranged on an arbor *y*, extending from stud *u* of bracket N, is the hub of a pinion U, having a side clutch-tooth *z*, engageable with a ratchet extremity of a crank V, and said pinion meshes with rack-teeth on the machine-standard. By operating crank V vertical adjustment of bracket N and parts in connection therewith is effected when crank T is loosened on pin S, back throw of the pinion being prevented by a detent *b'*, suspended from a stud *c'* of said bracket.

The upper edge of the non-tubular portion of standard B is provided with a guideway for a nut *d'* on the lower end of a headed rod W, that engages a yoke X, having a bottom flange supported on said standard edge, the rod-space in the yoke being at a right angle to said guideway. Hence it is obvious that said yoke is capable of adjustment on lines at right angles to each other, tightening of the rod serving to maintain the aforesaid yoke in adjusted position. Bolted or otherwise rigidly secured to yoke X, and hence adjustable therewith, is the vertical plate Y, that constitutes the backing for abrading-belt K, said plate being cushioned on the face or otherwise, as may be desirable in practice. For irregular work a form to fit the same may be

substituted for the aforesaid plate as a backing for the belt.

Standard B is provided with a lower bracket B', having a stud *e'*, that constitutes a pivot for an angle-arm Z, a branch *f'* of this arm being in connection with a rod A', that is loose in another bracket *g'* of said standard, this bracket being at a right angle to the one aforesaid. A spiral spring *h'* on rod A' abuts standard-bracket *g'*, and a hand-wheel C' has its hub in screw-thread engagement with the rod as a nut against the spring. In line with stud *e'* the angle-arm Z is provided with a bearing *i'* for a stud *j'* at the upper end of another arm D', that parallels the major portion of the aforesaid and has a horizontal branch *k'*, provided with an eye in which the reduced lower end of spindle J'' for loose pulley J' is stepped, said spindle being held against rotation by a set-screw *m'* engaging said arm branch. The arm D' constitutes what is hereinafter termed the "loose-pulley hanger," and its lower end is provided with a stud *n'*, engaging one extremity of a short link E', the other extremity of this link being engaged by another stud *p'*, in screw-thread eccentric connection with the axle *q'* of a peripherally-grooved semicircular rocker F', this axle being arranged to turn in a bearing *r'* at the lower end of an oblique shank of a -frame, and a counterweight G' is made fast on said axle. One arm H' of the -frame is provided with a stud *s'*, that turns in a bearing *t'*, with which the offset upper portion of arm Z is provided, and the upper terminal of this arm is in the form of a yoke, having set-screws *u'* engaging the branches thereof, these screws being in opposition to the interposed upper end of said frame-arm. The other arm H'' of the -frame is provided with axes for upper and lower sheaves *v' w'* for chains, cables, or other flexible runners *x' y'*, that have their lower ends joined to the extremities of counterweighted rocker F', that constitutes part of the governor mechanism herein set forth. The upper end of flexible runner *x'* is made fast to an ear of the hub of a disk I', that is loose on the corresponding end of loose-pulley spindle J'', and the upper end of the other flexible runner *y'* is likewise connected to an ear of the hub of a disk I'' on a lower enlargement of said spindle, these disks being of a diameter corresponding to that of the loose pulley J', arranged intermediate of the same, and the space between disks is sufficient for ordinary clearance of the abrading-belt, the upper bearing of said pulley being rested on a spiral spring K', seated upon a shoulder of spindle J'', this spring serving as a counterbalance for the aforesaid pulley, whereby the latter is free to reciprocate in synchrony with driving-pulley J under friction of said belt, yielding tension of this belt being regulated by the adjustment of hand-wheel C' on rod A' against spring *h'*, the latter serving as a cushion. The abrading device in any organization of the machine being reciprocative as

well as rotary, its motion on work held there-to is such as to prevent streaking.

By means of the hand-wheel C' and set-screws *u'* the arm Z' and -frame are pivotally adjusted to regulate belt tension and align loose pulley J', the swing-hanger for this pulley being in link connection with an eccentric stud of a counterweighted rocker, as above described. If for any reason the abrading-belt runs onto disk I' or disk I'', its friction will cause rotary movement of said disk to wind the flexible runner in connection therewith, the result being an automatic tilt of the -frame of the governor mechanism and hanger D' against resistance of counterweight G', to thereby vary the angle of the loose pulley in a direction that will cause said belt to move back to place on said pulley simultaneously with the return of the same with said hanger and frame to normal position incidental to automatic swing of said counterweight.

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

1. A sandpapering-machine comprising drive and loose pulleys, an abrading-belt on the pulleys, means for imparting automatic positive reciprocation to the belt, and other means for limiting movement of said belt in both directions of its reciprocation.

2. A sandpapering-machine comprising drive and loose pulleys, an abrading-belt having variable-tension arrangement on the pulleys, means for imparting automatic positive reciprocation to the belt, and other means for limiting movement of said belt in both directions of its reciprocation.

3. A sandpapering-machine comprising an abrading-belt, a positively-reciprocative drive-pulley for the belt, and a loose pulley for said belt reciprocative in synchrony with the same under friction thereof independent of the drive-pulley.

4. A sandpapering-machine comprising an abrading-belt, a positively-reciprocative drive-pulley for the belt, and an automatically-oscillative loose pulley for said belt reciprocative in synchrony with the same under friction thereof independent of the drive-pulley.

5. A sandpapering-machine comprising a base, a standard in swivel connection with the base, a pulley fast on a spindle engaging bearings with which the standard is provided, a loose pulley in oscillative connection with said standard, and an abrading-belt on the pulleys.

6. A sandpapering-machine comprising a base, a standard in swivel connection with the base, a pulley fast on a spindle engaging bearings with which the standard is provided, means for reciprocating the spindle, a loose pulley in oscillative connection with the standard, and an abrading-belt on the pulleys.

7. A sandpapering-machine comprising a standard, a bracket in connection with the

standard, a yoke in pivotally-adjustable connection with the bracket, and a work-table having under side pivotally-adjustable connection with the yoke branches.

8. A sandpapering-machine comprising a standard, a bracket in vertically-adjustable connection with the standard, a yoke in pivotally-adjustable connection with the bracket, and a work-table having an under side block in like connection with the yoke branches.

9. A sandpapering-machine comprising a standard provided with a vertical rack, a bracket having sliding engagement with the standard, a clamp mechanism for the bracket, a loose pinion carried by said bracket in mesh with the rack portion thereof, a crank having ratchet-clutch connection with a side of the pinion, and a work-table in connection with the aforesaid bracket.

10. A sandpapering-machine comprising an abrading-belt and means for actuating same, a work-table, a pivotally-adjustable bracket, and a work-gage adjustable on the bracket in a direction transverse to the travel of the belt.

11. A sandpapering-machine comprising an abrading-belt, means for actuating same, and a belt-backing adjustable on lines at right angles to each other.

12. A sandpapering-machine comprising a drive-pulley, a pivotal hanger, a loose pulley having its spindle in connection with the hanger, an abrading-belt on the pulleys, and governor mechanism operative in conjunction with the belt and loose-pulley hanger.

13. A sandpapering-machine comprising a drive-pulley, a pivotal hanger, a spindle rigid with the hanger, a loose pulley counterbalanced on said spindle, an abrading-belt on the pulleys, governor mechanism operative in conjunction with said belt and hanger, and means for reciprocating the belt.

14. A sandpapering-machine comprising a drive-pulley, a pivotal hanger, a spindle rigid with the hanger, a pulley and disks of corresponding diameter loose on said spindle, the pulley being intermediate of the disks, an abrading-belt on the pulleys, a frame in pivotally-adjustable connection with the support for said hanger, sheaves carried by the frame, a counterweighted rocker suspended from said frame, in eccentric connection with said hanger, and flexible sheave-opposing runners in connection with said disks and rockers.

15. In a sandpapering-machine the combination of a drive-pulley, a pivotally-adjustable arm, a hanger in pivotal connection with the arm, a spindle rigid with the hanger, a pulley and disks of corresponding diameter loose on said spindle, the pulley being intermediate of the disks, an abrading-belt on the pulleys, a frame in pivotally-adjustable connection with said arm, sheaves carried by the frame, a counterweighted rocker suspended from said frame in eccentric connection with said hanger, and flexible sheave-

opposing runners in connection with said disks and rockers.

16. In a sandpapering-machine, the combination of a drive-pulley, a pivotally-adjustable spring-controlled arm, a hanger in pivotal connection with the arm, a spindle rigid with the hanger, a pulley and disks loose on the spindle, the pulley being intermediate of the disks, an abrading-belt on the pulleys, a frame in pivotally-adjustable connection with said arm, sheaves carried by the frame, a counterweighted rocker suspended from said frame in eccentric connection with said hanger, and flexible sheave-opposing runners in connection with said disks and rockers.

17. A sandpapering-machine, comprising a base, a standard in swivel connection with the base, a spindle having its bearings in the base, means for reciprocating the spindle, a pulley fast on said spindle, a loose pulley

having an oscillative hanger, an abrading-belt adjustable as to tension on the pulleys, an adjustable backing for the belt, and a universally-adjustable work-table.

18. A sandpapering-machine comprising a base, a standard in swivel connection with the base, a spindle having its bearings in the base, means for reciprocating the spindle, a pulley fast on said spindle, an oscillative loose pulley, an abrading-belt adjustable as to tension on the pulleys, an adjustable backing for the belt, a universally-adjustable work-table, and an adjustable work-gage.

In testimony that I claim the foregoing I have hereunto set my hand, at Racine, in the county of Racine and State of Wisconsin, in the presence of two witnesses.

CHARLES H. DRIVER.

Witnesses:

JOHN H. HAPP,
R. JONES.