No. 607,990. Patented July 26, 1898.

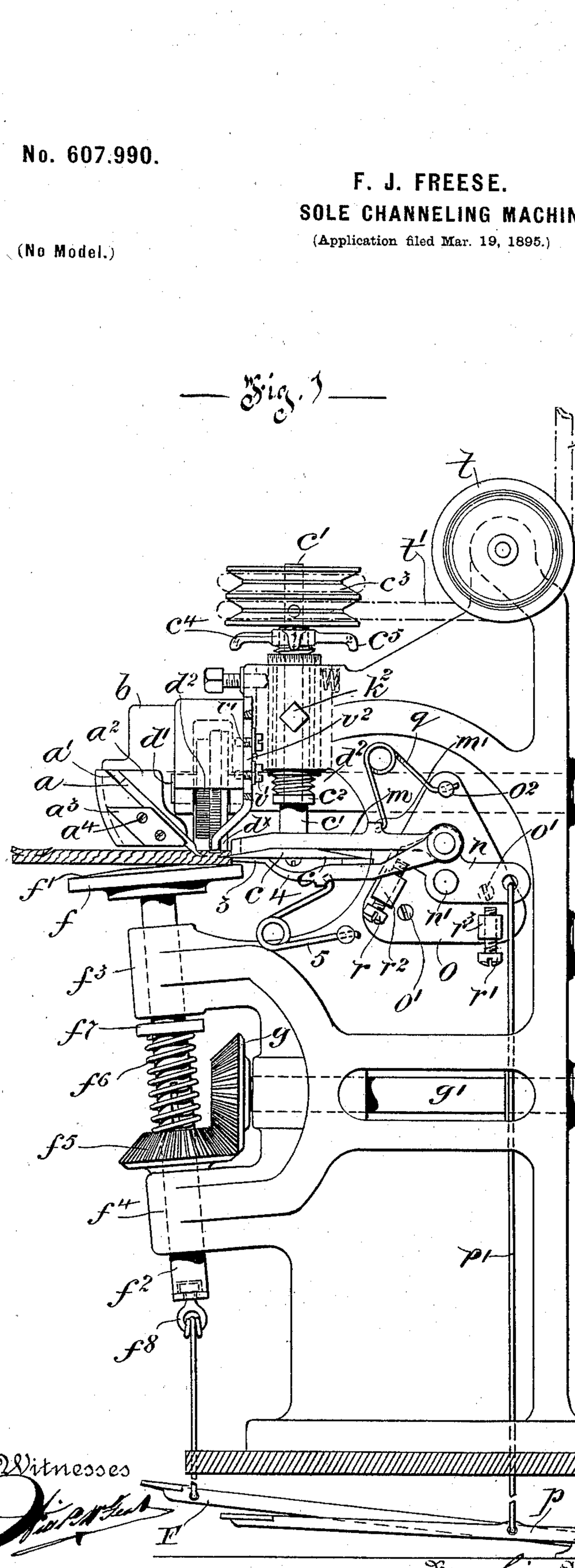
F. J. FREESE.

SOLE CHANNELING MACHINE.

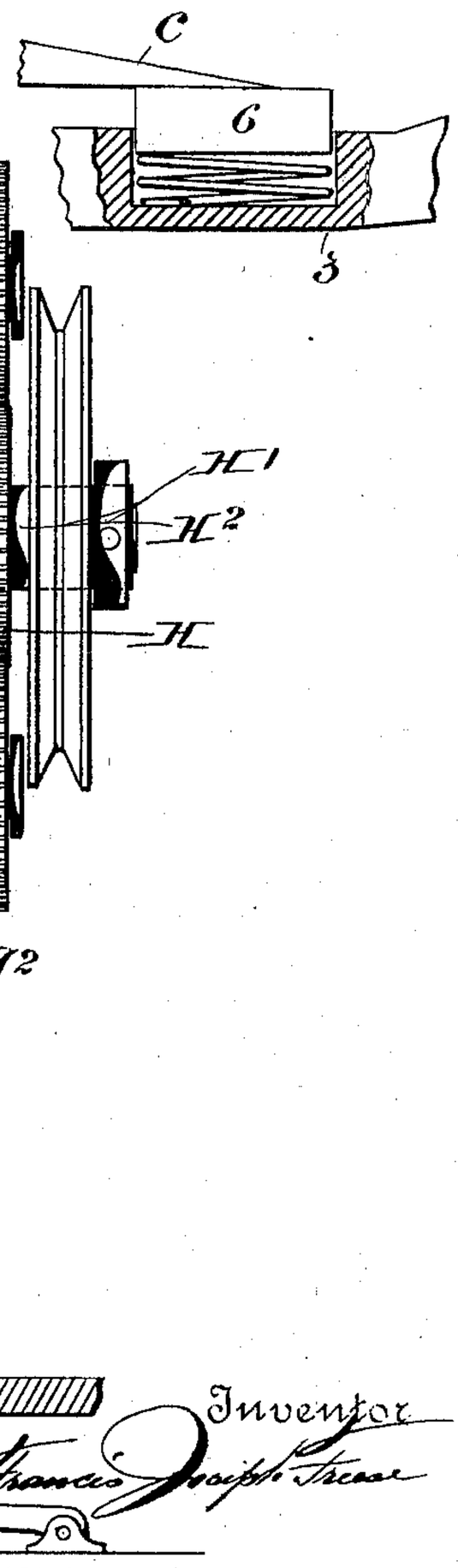
(Application filed Mar. 19, 1895.)

(No Model.) 3 Sheets—Sheet 1.

— Fig. 1 —



— Fig. 4 —



Witnesses

Inventor

By his Attorney

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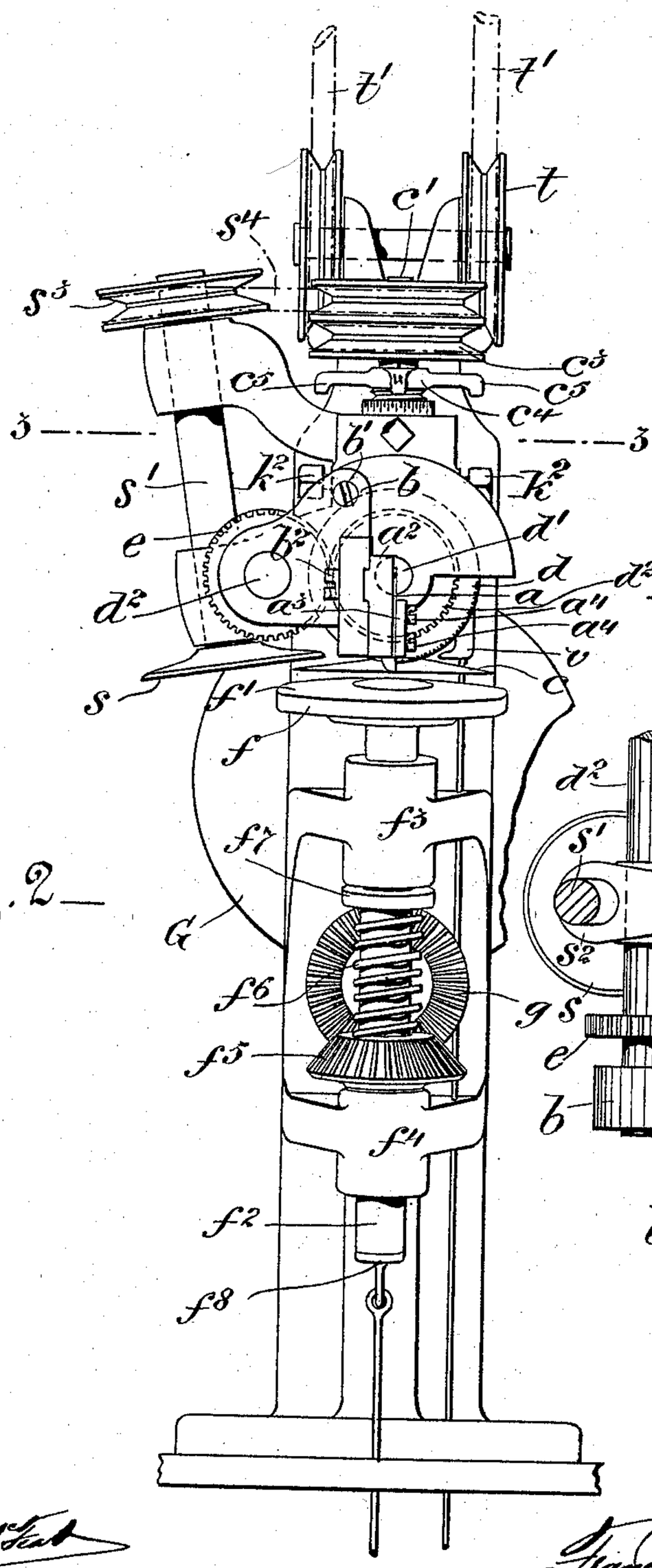
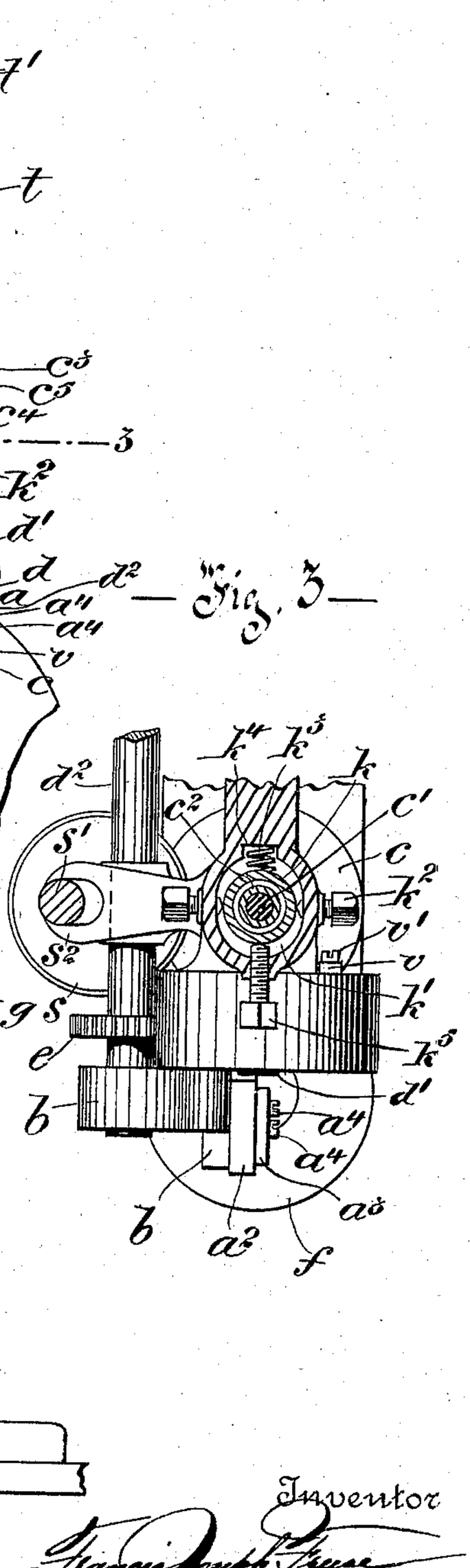
3 Sheets—Sheet 2.



— Fig. 2 —



— Fig. 3 —

Witnesses

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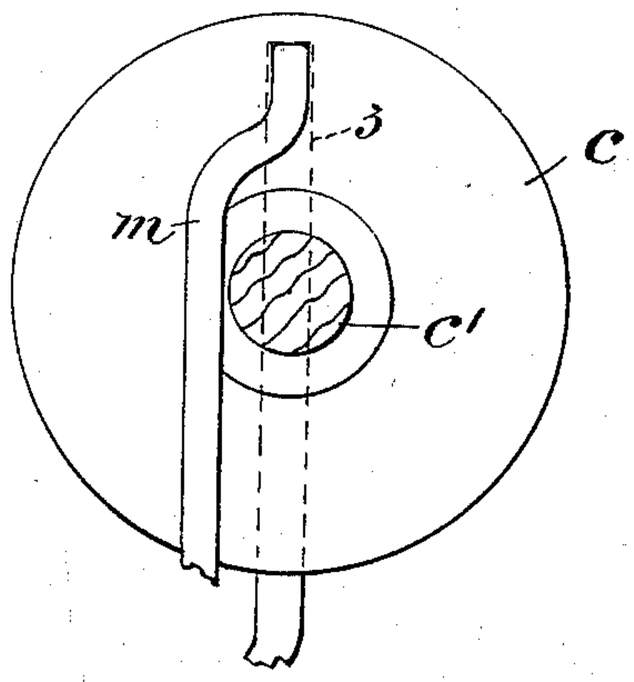
3 Sheets—Sheet 3.

— Fig. 5 —



Witnesses

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UNITED STATES PATENT OFFICE.

FRANCIS JOSEPH FREESE, OF LOWELL, MASSACHUSETTS.

SOLE-CHANNELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 607,990, dated July 26, 1898.

Application filed March 19, 1895. Serial No. 542,421. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS JOSEPH FREESE, of Lowell, county of Middlesex, State of Massachusetts, temporarily residing in the city of Montreal, in the district of Montreal and Province of Quebec, Canada, have invented certain new and useful Improvements in Sole-Channeling Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

This invention relates to sole-channeling machines, and more particularly to machines for cutting the surface and edge channels of insoles, the object being to provide a power-driven machine for this purpose embodying as novel features various combinations of parts and the particular construction of several of the devices used therein, as hereinafter described, and particularly pointed out in the claims.

For full comprehension, however, of the invention reference must be had to the annexed drawings, forming a part of this specification, in which like symbols indicate corresponding parts, and wherein—

Figures 1 and 2 are respectively side and front elevations of the machine, part of the supporting-pedestal being broken away; Fig. 3, a detail transverse horizontal section of the fore part of the machine, taken on line 3 3, Fig. 2; Fig. 4, a detail side elevation, partly in section, of a portion of one of the work-guides with a whetstone mounted thereon; Fig. 5 being a detail horizontal sectional view showing the position of the edge work-guide relatively to the rotary cutter.

The machine now to be described has in common with other sole-channelers a stationary "surface-channeling" knife or cutter a, adjustable, as usual, in a groove a' in a carrier-block a^2 and clamped in position by a plate a^3, secured by set-screws a^4 to such blocks, the latter being carried, preferably, by a removable bracket-piece b, (with which it has a tongue-and-groove connection,) bolted at b' to the frame of the machine, and through which bracket a screw-stud b^2 passes to retain such carrier-block in place. The "edge-channeling" knife or cutter in this case is in the form of a horizontally-rotating disk c, mounted rigidly on the lower end of a vertical spindle c', which for purposes of adjustment is preferably carried within a sleeve c^2, screw-threaded on its exterior to take either into a screw-threaded vertical aperture through the frame of the machine or into a second encircling sleeve to be presently mentioned, the upper end of the spindle c' carrying driving-pulleys c^3, rigidly mounted thereon, and the sleeve c^2 having a finger-nut c^4 fixed upon its upper end.

In order that an equal feeding of the stock against the resistance of both knives or cutters may be secured and also that the feed may act as a stay to the stock in the event of one cutter being dispensed with at any time, the feed-disk d is located to rotate in a vertical plane in advance of each cutter and centrally between the respective edges of both and a short distance above same when they are in their normal working position, as shown in Fig. 1, the feed-disk being rigidly mounted on a horizontal stub-axle d', bearing in the frame of the machine.

The feed-disk has two laterally-projecting concentric side faces, one of which, d^2, is toothed to intermesh with and allow the disk to be driven by a pinion e, carried by a shaft d^2, having its forward end bearing in the bracket-piece b and its rear end, which carries a gear-wheel e', bearing in the frame of the machine. The other laterally-projecting side face $d^\times$ of the feed-disk is plain and serves as a gage to restrict the depth to which the friction-teeth of the feed-disk d will sink into the work.

To insure the feeding of the work in a true horizontal line, I attach a vertically-adjustable gage or guide in the form of a bent finger v to the side of the frame by screws v' v', taking through slot v^2 in the upper end of such bent finger or guide into the frame of the machine, and such adjustable gage is located so that its lower bent portion will bear upon the work in close proximity to the feed-disk.

Beneath the cutters and feed-disk is arranged a table or work-support, preferably in the form of a disk f, with the periphery of its upper surface beveled, as at f', and rigidly mounted on the upper end of a rotating shaft f^2, carried slightly out of the vertical in bearings f^3 f^4, projecting from the frame, the body of the table being consequently slightly

out of the horizontal, but with its beveled portion f' presenting a horizontal surface to receive the work, which construction and arrangement while securing the large rotating surface yet leave a convenient space between the table and the outer edge of the stock for handling the stock.

To secure the rotation of the table or work-support, a bevel-gear f^5 is mounted upon the shaft f^2, has a feather-and-spline connection therewith, and intermeshes with a bevel-gear g, carried rigidly on the front end of a horizontal shaft g', which bears in the frame of the machine and carries on its rear end a gear-wheel g^2 similar to the one e'. These gear-wheels e' and g^2 are of the same size, so as to rotate the shafts d' and g', upon which they are mounted, at the same rate of speed, and they are operated (through the driving-pulley G) by an intermediate gear-wheel H, in mesh with both, carried upon and rigidly connected to a sleeve H', mounted loosely on a stud-axle H^2, carried rigidly on the rear of the frame of the machine.

The connection of bevel-gear f^5 to shaft f^2 by feather and spline allows of a vertical adjustment of the table to and from the cutters a and c, so that various thicknesses of stock can be operated upon and the stock set in place.

The table is kept normally elevated to a position in close proximity to the cutters by means of a coiled spring f^6, encircling the shaft f^2 and bearing between the upper side of bevel-gear f^5 and the under side of a collar f^7, mounted rigidly on such shaft f^2, and as a means for lowering the table from the cutters I connect the lower end of the vertical shaft f^2 to a treadle F by a swiveling connection f^8.

It is not essential that special means be provided to rotate the work-support, as it may be mounted to rotate in its bearings and follow and support the stock by friction alone when it is fed by feed-disk d.

To enable the edge-channeler c to be adjusted to cut at various angles, I mount its carrying-sleeve c^2 in a second sleeve k, screw-threaded on its inside to receive it, and this sleeve k is pivotally supported in an opening k' in the frame of the machine by set-screws k^2 k^2, taking in the frame and located so as to bear on opposite sides of such sleeve k. A coiled spring k^3 is carried in a recess k^4 in the rear side of opening k' and adjusted to bear upon the upper end of sleeve k, so as to keep it normally in contact with a set-screw k^5, carried in the front portion of the frame and projecting into the opening k', by means of which set-screw k' bearing upon sleeve k the the cutter c is horizontally adjusted. The vertical adjustment of this cutter c can be secured either by rotating sleeve c^2 in sleeve k by means of finger-nut c^4 or by loosening the set-screws k^2 k^2 and raising or lowering the sleeve k until the cutter c is brought to the desired position.

The adjustable guide that I prefer to use in connection with cutter c to regulate the depth it is to cut into the work is in the form of an arm m, pivotally connected to the vertical arm of a bell-crank lever n, fulcrumed at n' to a carrying-plate o, secured to the side of the frame of the machine by screws o' o' and screw-bolt o^2, having a perforated head. The horizontal arm of this bell-crank lever n is connected by a rod p' with a treadle p, and such horizontal arm is kept normally elevated by the action of a V-shaped spring q, having one end bearing in the perforation in the head of screw-bolt o^2 and its other end bearing behind a shoulder m' on arm m, so as to exert a forward and downward pressure upon such arm m.

The movement of the bell-crank lever is regulated by means of adjustable stops, preferably in the form of screws r r', taking, respectively, into interiorly-screw-threaded sleeves r^2 r^3, carried by the plate o.

If desired, a second guide similar to the one m and in the form of a bar 3, also pivotally connected at the rear end to the vertical arm of the bell-crank lever n and extending forward to bear against the edge of the stock beneath the cutter, can be used to guard against any possibility of a thin upper half of the stock being so crumpled as to allow of misplacement of the sole, the guide 3 preferably having a depression 4 to clear the retaining-screw of the cutter and being thrown forward by a similar V-spring 5.

Either of the guides m or 3 may, if desired, carry a whetstone 6, shown in this instance as carried by guide 3 for permanently acting upon the cutter.

s is the grinder-disk, mounted rigidly on the lower end of a vertical spindle s', bearing in a lateral bracket extension s^2 from the opposite side of the frame of the machine to that on which the stationary cutter is carried and located so that a portion of the periphery of the grinder-disk s will project a short distance over the periphery of the edge-channeler c when in its working position. A rotary motion is imparted to this grinder through a pulley s^3, mounted rigidly upon the upper end of its vertical spindle s' from pulley-block c^3, with which it is connected by a belt s^4. The pulley-block c^3 is operated by pulley-and-belt connections t t' with any available initial power.

The upper edge of sleeve c^2, that carries the edge-channeler, is preferably graduated, and the finger projections c^5 of finger-nut c^4 register with such graduations, thus providing a means whereby the vertical adjustment of cutter c can be regulated with exactness.

To sharpen the edge channeler or cutter c, it is raised until it comes into contact with the grinder-disk s, this, of course, being done while both cutter and grinder-disk are rotating.

To cut a surface and an edge channel in an insole on a machine constructed according to

my invention, the table or work-support must first be lowered and the work set in place, with its edge to be operated upon bearing against the work-guide *m* and ready to be gripped by the feed-disk *d* and the table, which happens immediately the table is raised.

The depth of the edge channel can be varied by moving backward or forward the work-guides *m* 3 by depressing or releasing the treadle *p*, thereby allowing the cutter to enter the work a greater or less degree, as is required, for instance, in channeling an insole where the "shank" requires a greater depth of channel than the "fore part," the stops *r r'* being made adjustable, so that the extremes of depth of the edge channel can be regulated.

What I claim is as follows:

1. A channeler having a stationary cutter and a rotary cutter, the stationary cutter set at an angle to the plane of rotation of the rotary cutter and with the cutting edge thereof curved toward said rotary cutter.

2. A channeler having a yieldingly-adjustable work-support mounted on an axis inclined to the vertical, and feed mechanism, a work-guide, and a grinder, a stationary cutter and rotary cutter, the stationary cutter set at an angle to the plane of rotation of the rotary cutter and having the cutting end thereof curved toward the edge of said rotary cutter, and means for operating said rotary cutter, for the purpose set forth.

3. A channeler having a stationary cutter and rotary cutter, a vertically-rotatable feed device located above such rotary cutter, a rotary work-support mounted on an axis inclined to the vertical and adjustable in line therewith, an adjustable work-guide, a grinder, the stationary cutter set at an angle to the plane of rotation of the rotary cutter and having the cutting end thereof curved toward the edge of said rotary cutter, and means for operating such rotary cutter, work-support and feed device, and for adjusting such work-support, and work-guide for the purpose set forth.

4. A channeler having a rotary cutter and a work-guide, the latter located in rear of the edge of the cutter and in radial line with and in the same vertical plane as its axis to bear upon the edge of stock being cut.

5. A channeler having a rotary cutter and an adjustable work-guide, the latter located in rear of the edge of the cutter and in radial line with and in the same vertical plane as its axis to bear upon the edge of the stock being cut.

6. A channeler having a work-support mounted on an axis inclined to the vertical and a rotary cutter and a work-guide, the latter located between the work-support and cutter in line with the axis of the latter for the purpose set forth.

7. A channeler having a rotary cutter, mounted rigidly on a rotatable spindle carried loosely in an adjustable sleeve pivotally carried in the frame of the machine, and means for operating such spindle, for the purpose set forth.

8. A channeler having a rotary cutter, mounted rigidly on a rotatable spindle carried loosely in a sleeve externally screw-threaded to take into the screw-threaded interior of a second sleeve, an opening in the frame of the machine in which said second sleeve is pivotally mounted and means for adjusting and operating such spindle, for the purpose set forth.

9. A channeler having a rotary cutter mounted rigidly on a rotatable spindle carried loosely so as to rotate freely in an adjustable sleeve pivotally carried in the frame of the machine, a finger-nut rigidly mounted on said sleeve and graduations on the carrying part for such sleeve with which a portion of such finger-nut registers, and means for operating such spindle, for the purpose set forth.

10. A channeler having a rotary cutter mounted rigidly on a rotatable spindle carried loosely in a sleeve externally screw-threaded to take into the screw-threaded interior of a second sleeve, a finger-nut rigidly mounted on said externally-screw-threaded sleeve and graduations on the carrying part for such sleeve with which a portion of such finger-nut registers, an opening in the frame of the machine in which said second sleeve is pivotally mounted, and means for adjusting and operating such spindle, for the purpose set forth.

11. A channeler having a rotary cutter mounted rigidly on a rotatable spindle carried loosely in an adjustable sleeve pivotally carried in the frame of the machine, a stationary grinder and means for operating such spindle, for the purpose set forth.

12. A channeler having a rotary cutter mounted rigidly on a rotatable spindle carried loosely in a sleeve externally screw-threaded to take into the screw-threaded interior of a second sleeve, an opening in the frame of the machine, in which said second sleeve is pivotally mounted, a stationary grinder and means for adjusting and operating such spindle, for the purpose set forth.

13. A channeler having a rotary cutter mounted rigidly on a rotatable spindle carried loosely in an adjustable sleeve in the frame of the machine, a finger-nut rigidly mounted on said externally-screw-threaded sleeve and graduations on the carrying part for such sleeve with which a portion of such finger-nut registers, a stationary grinder, and means for operating such spindle, for the purpose set forth.

14. A channeler having a rotary cutter, with means for operating same, a work-guide the guiding end of which is located in rear of the edge of the cutter and in radial line with and in the same vertical plane as the axis of same, a bell-crank lever fulcrumed to the frame of the machine and having the other end of the guide pivotally connected to one arm thereof

and a treadle connection with the other arm of such bell-crank lever, for the purpose set forth.

15. A channeler having a rotary cutter, with means for operating same, a work-guide, the guiding end of which is located in rear of the edge of the cutter and in radial line with and in the same vertical plane as the axis of same, a bell-crank lever fulcrumed to the frame of the machine and having the other end of the guide pivotally connected to one arm thereof, a treadle connection with the other arm of such bell-crank lever and adjustable limiting-stops, for the purpose set forth.

16. A channeler having a rotary cutter, with means for operating same, a work-guide the guiding end of which is located in rear of the edge of the cutter, and in radial line with and in the same vertical plane as the axis of same, a bell-crank lever fulcrumed to the frame of the machine and having the other end of the guide pivotally connected to one arm thereof, means for exerting upon such work-guide a yielding pressure forward and toward such rotary cutter, and a treadle connection with the other arm of such bell-crank lever, for the purpose set forth.

17. In combination with the cutter of a channeler, work-guiding mechanism having a part above the cutter and a part below the cutter to present a guiding-face above and below said cutter, for the purpose set forth.

18. In combination with the cutter of a channeler, a work-guide in the form of an arm with one end located in rear of the edge of the cutter and in radial line with and in the same vertical plane as the axis of same, and the other end pivotally connected to one arm of a bell-crank lever, the other arm of which lever has a treadle connection, and means for limiting the movement of and for exerting a forward and lateral pressure upon such work-guide, for the purpose set forth.

19. In combination with the cutter of a channeler, work-guiding mechanism adapted to present a guiding-face above and below said cutter, said work-guiding mechanism consisting of a guide-arm located above such cutter with one end in rear of the edge of the cutter and in radial line with and in the same vertical plane as the axis of same, and the other end pivotally connected to one arm of a bell-crank lever, the other arm of which lever has a treadle connection and a second guide-arm located below the cutter and having one end in vertical line with the end of the first-mentioned guide-arm and its other end pivotally connected to said first-mentioned arm, and means for exerting a forward and lateral pressure upon such work-guide, for the purpose set forth.

20. In combination with the cutter of a channeler, work-guiding mechanism adapted to present a guiding-face above and below said cutter, said work-guiding mechanism consisting of a guide-arm located above such cutter with one end in rear of the edge of the cutter and in radial line with and in the same vertical plane as the axis of same, and the other end pivotally connected to one arm of a bell-crank lever, the other arm of which lever has a treadle connection, and a second guide-arm located below the cutter and having one end in vertical line with the end of the first-mentioned guide-arm and its other end pivotally connected to said first-mentioned arm, and means for limiting the movement of and exerting a forward and lateral pressure upon such work-guide, for the purpose set forth.

Montreal, February 16, 1895.

FRANCIS JOSEPH FREESE.

In presence of—
FRED. J. SEARS,
RUP. H. KRINLER.