

No. 758,520.

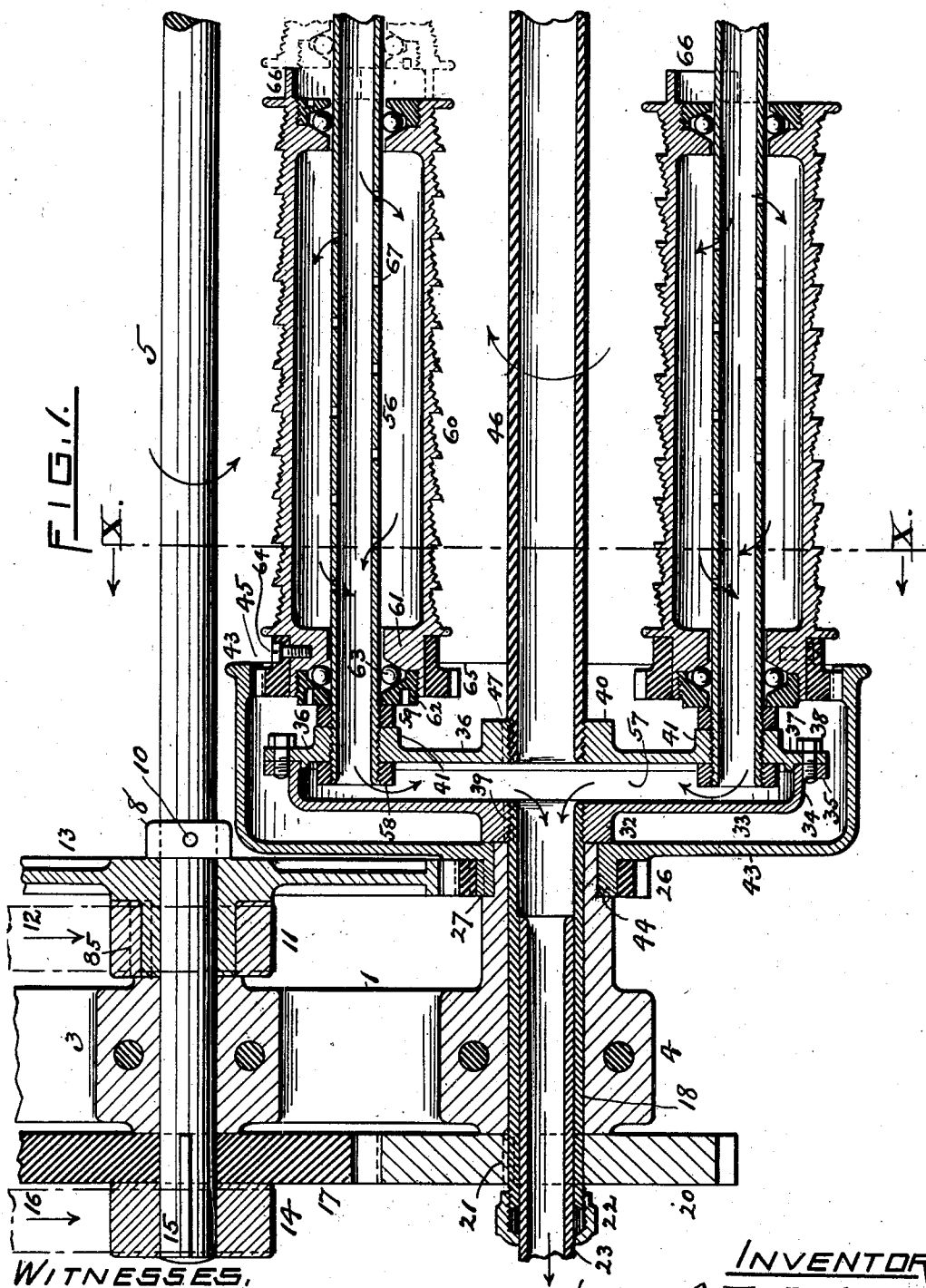
PATENTED APR. 26, 1904.

G. A. FREDENBURGH.
THREAD DRESSING MACHINE.

APPLICATION FILED DEC. 1, 1902.

NO MODEL.

5 SHEETS—SHEET 1.



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George A. Fredenburgh.

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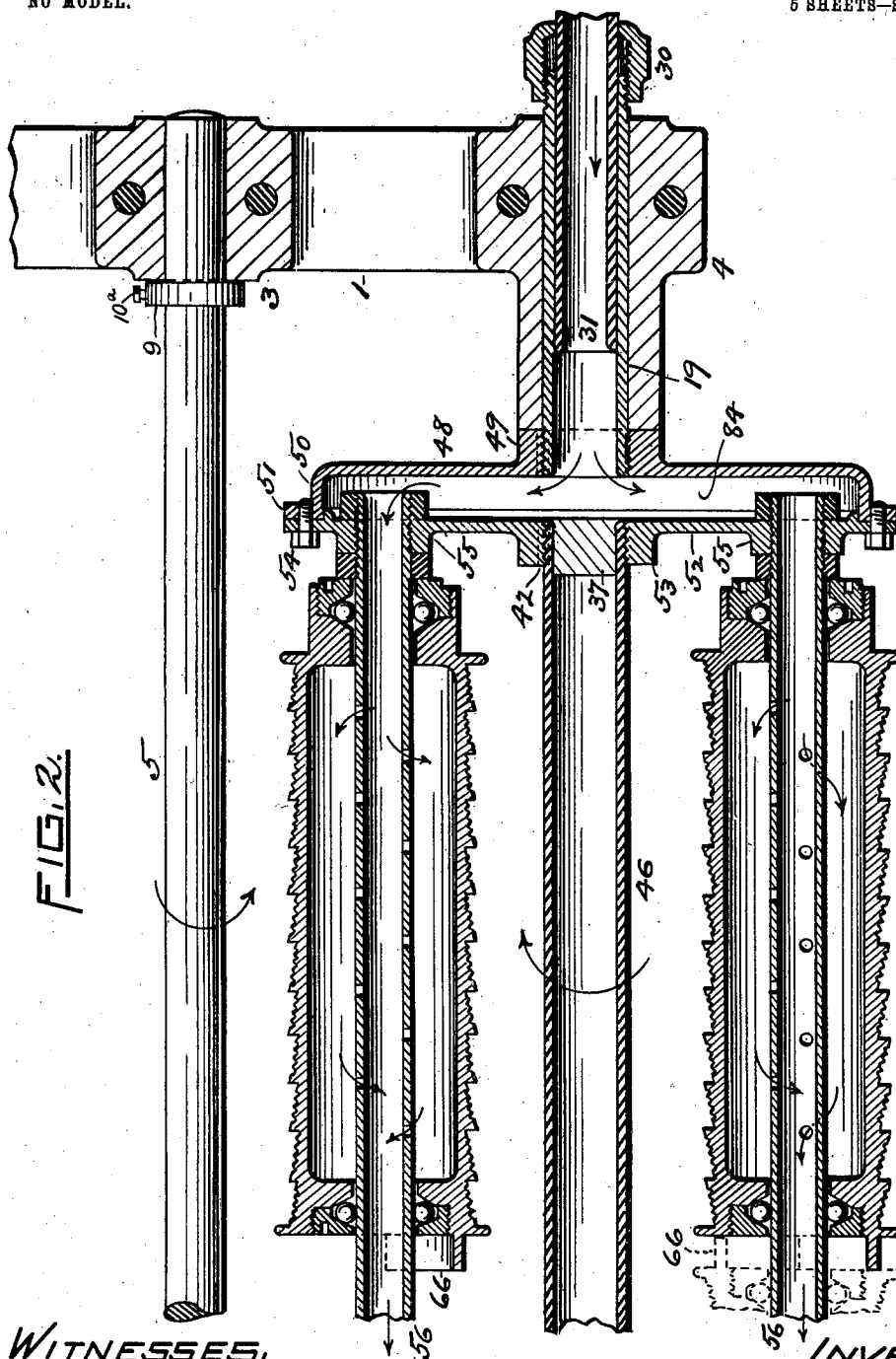
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5 SHEETS—SHEET 2.



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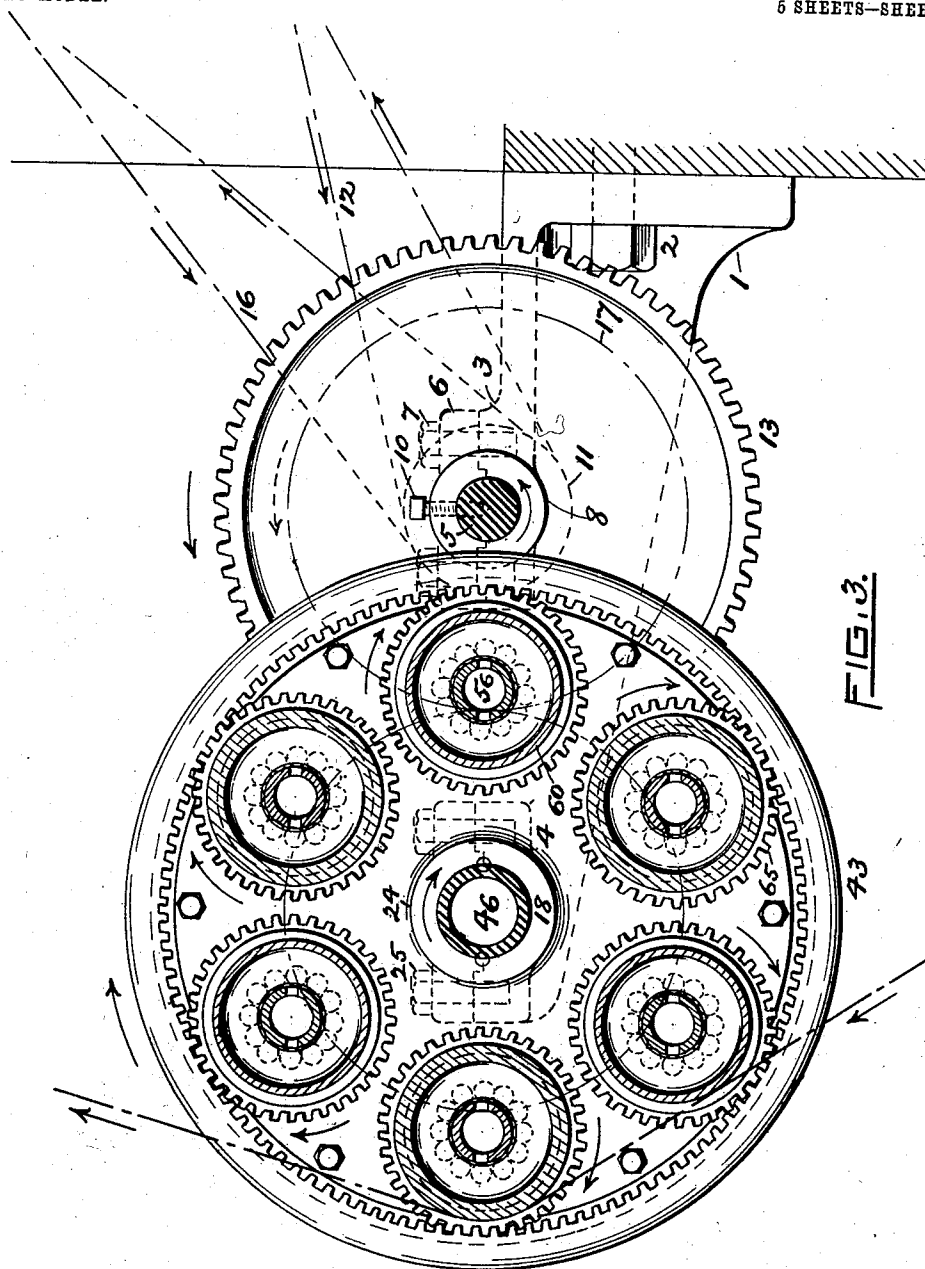
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5 SHEETS—SHEET 3.



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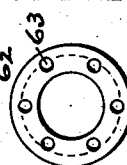
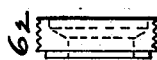
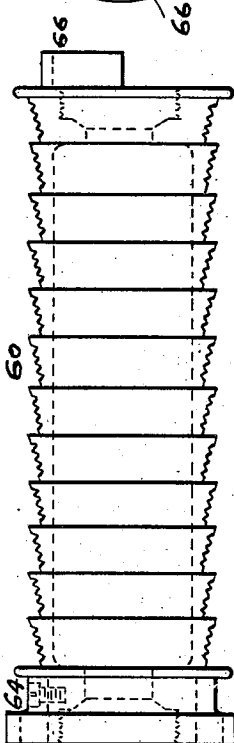
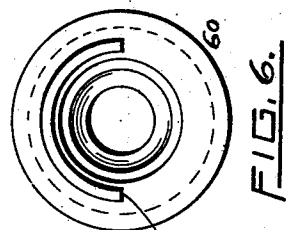
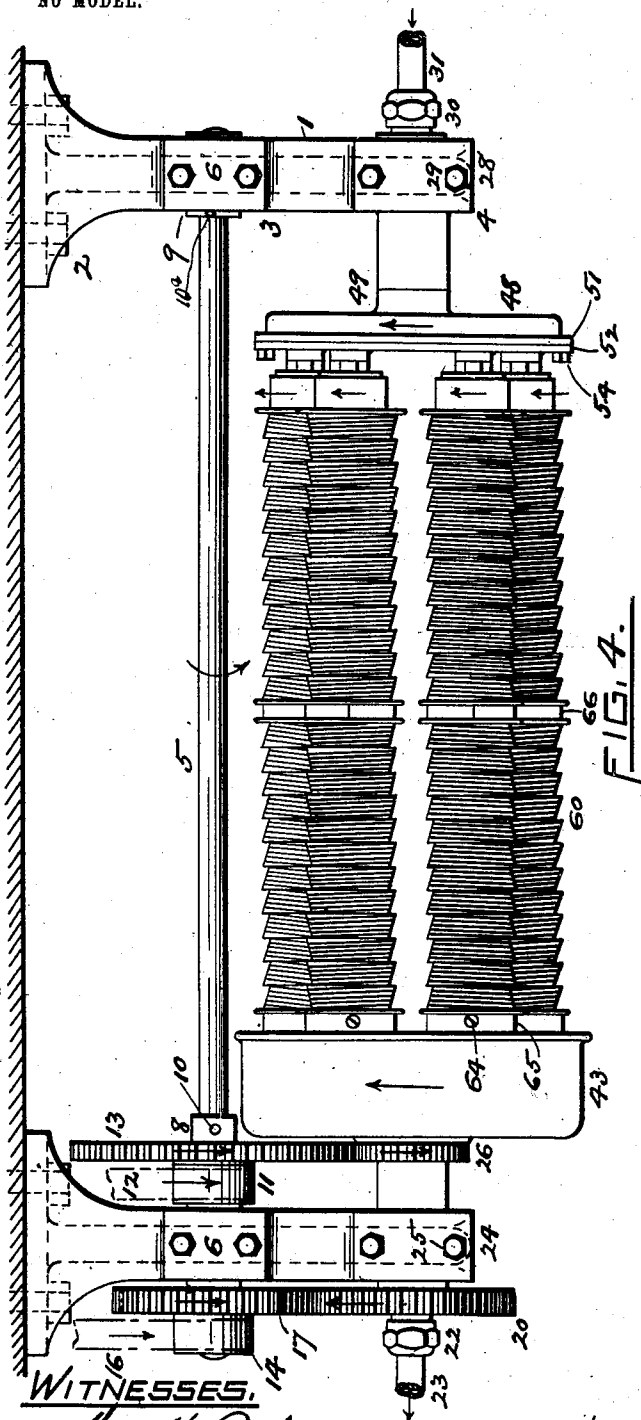
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5 SHEETS—SHEET 4.



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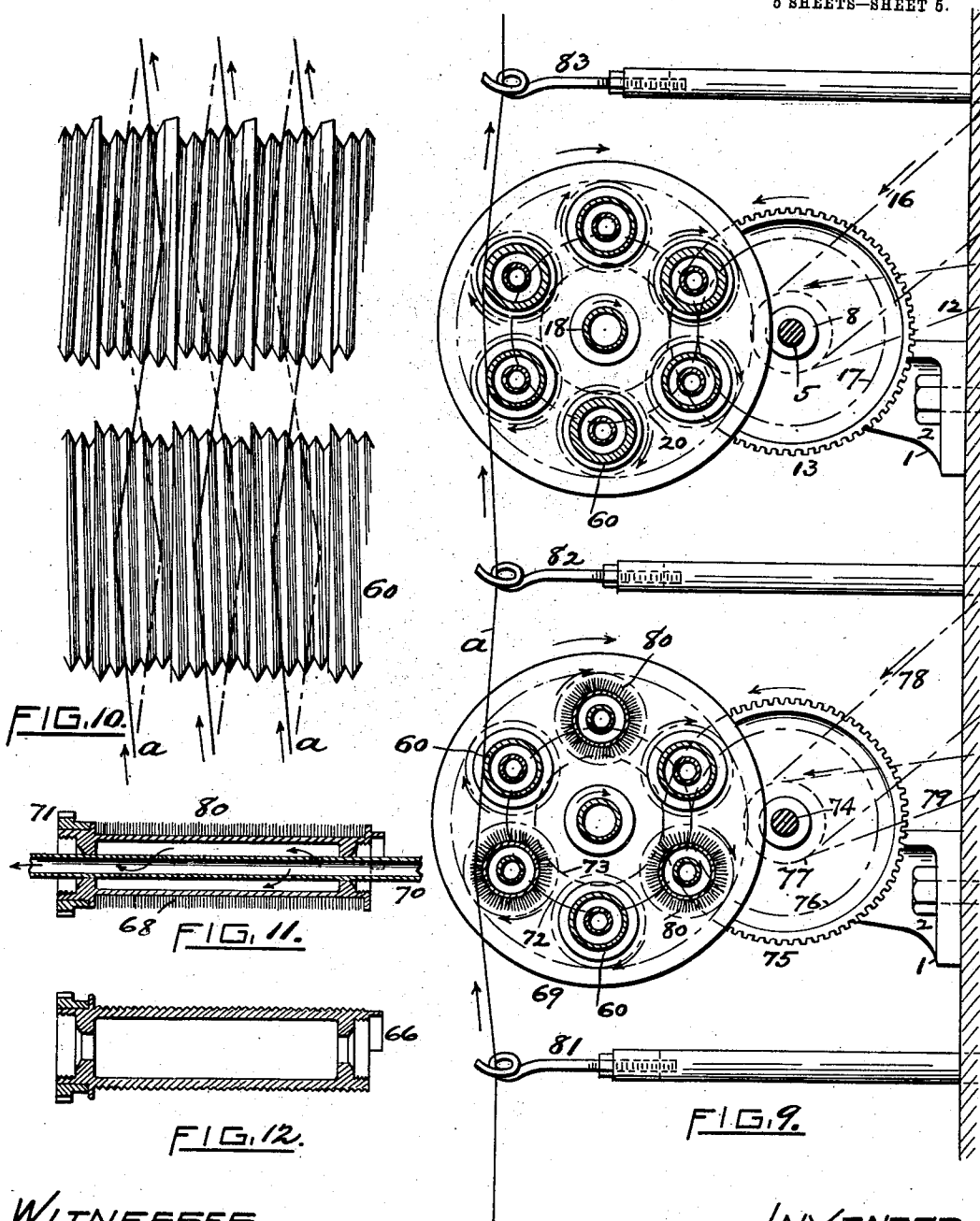
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G. A. FREDENBURGH.
THREAD DRESSING MACHINE.

APPLICATION FILED DEC. 1, 1902.

NO MODEL.

5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

GEORGE A. FREDENBURGH, OF PAWTUCKET, RHODE ISLAND.

THREAD-DRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 758,520, dated April 26, 1904.

Application filed December 1, 1902. Serial No. 133,515. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. FREDENBURGH, a citizen of the United States, residing at the city of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Thread-Dressing Machines, of which the following is a specification.

My invention relates to a thread-dressing machine provided with brush-cylinders and ironers; and it consists of the novel construction and combination of the several parts, as hereinafter described, and specifically set forth in the claims.

Figure 1 is a view, partly in top plan and partly in central longitudinal section, of the left-hand portion of my improved thread-dressing machine. Fig. 2 is a like view of the right-hand portion of said machine. Fig. 3 is a view of said machine as seen, partly in elevation and partly in section, on line X X of Fig. 1. Fig. 4 is a top plan view of the said machine on a smaller scale. Fig. 5 is a front elevation of one of the ironers. Fig. 6 is an end elevation of the same. Fig. 7 is a side elevation of the ball-bearing screw-plug. Fig. 8 is an end elevation of the same. Fig. 9 is a side elevation of the brush-cylinders and ironers and the mechanism for driving the same, respectively, together with the thread-guides directing the thread to said brush-cylinders and said ironers. Fig. 10 is a view in front elevation of two contiguous ironers and shows the direction of the movements of the threads in passing over the same. Fig. 11 is a central longitudinal section of one of the brush-cylinders. Fig. 12 is a central longitudinal section of a modified form of an ironer.

Like characters indicate like parts.

In the drawings, 1 represents the brackets or supports of the machine secured by bolts 2 upon the frame of a machine and furnished with bearings or journals 3 4. In the journal-bearings 3 3 the shaft 5 is rotatably mounted, and semitubular caps 6 cover the said shaft and are secured to the bearings 3 3 by bolts 7. On the shaft 5 is loosely mounted a gear 13, having a centrally-projecting hub whose outer face is close to the left-hand jour-

nal-bearing 3, and on the hub of said gear 13 is keyed a driving-pulley 11. A collar 8 surrounds the shaft 5 and lies close to the inner face of the hub of the gear 13, and said collar is held in place upon the shaft 5 by a set-screw 10. Another collar, 9, also surrounds the shaft 5 and lies close to the inner face of the right-hand journal-bearing 3, and said collar is held in place upon the shaft 5 by a set-screw 10. Said collars 8 and 9 serve to prevent longitudinal movement of the shaft 5. At the end of the shaft 5 is also a driving-pulley 14, fastened thereon by a key 15 and is driven by a belt 16. A gear 17 is also fastened on the shaft 5 by said key 15. In the journal-bearings 4 4 are mounted rotatably the tubular shafts 18 and 19, as seen in Figs. 1 and 2. A gear 20 is mounted on the tubular shaft 18 and is fastened thereon by a key 21. The gear 20 meshes with the gear 17. A tubular cap 22, having a central aperture and screw-threaded on its inner surface, is secured upon the outer threaded end of the tubular shaft 18, as shown in Fig. 1. A stationary steam-pipe 23 passes through the central aperture of the cap 22 and extends into the tubular shaft 18. A semitubular cap 24 covers the tubular shaft 18 and is fastened by bolts 25 to the journal-bearing 4. A gear 26 is fastened by a key 27 upon the hub of an internal gear 43, and said internal gear is loosely mounted upon a reduced portion of the hub of the journal-bearing 4. (See Fig. 1.) The gear 26 meshes with the gear 13. In the opposite journal-bearing 4, Fig. 2, is rotatably mounted the tubular shaft 19. A semitubular cap 28 covers the end of the shaft 19 and is fastened to the journal-bearing 4 by screws 29. A tubular cap 30, whose head has a central aperture, is screwed upon the outer threaded end of the tubular shaft 19. A stationary steam-pipe 31 passes through the central aperture of the cap 31 and extends into the tubular shaft 19.

On the tubular shaft 18, at the inner screw-threaded end thereof, is fastened, by means of a screw-threaded hub 32, the disk 33, having the flanges 34 and 35. A disk 36 is secured to the flange 35 of the disk 33 by the screws 38. The disk 33 has its hub 32 keyed at 39 to the tubular shaft 18. The disk 36 has the

tubular hub 40 and a circularly-arranged series of tubular screw-threaded bosses 41.

A tubular shaft 46 has screw-threaded ends one of which engages with the screw-threaded hub 40 of the disk 36, to which hub it is keyed, as shown at 47.

As seen in Fig. 2, the disk 48 has a screw-threaded hub 49, by which it is engaged with the screw-threaded end of the tubular shaft 19. The disk 48 has the flanges 50 51. A disk 52 has a screw-threaded hub 53, which receives one of the screw-threaded ends of the tubular shaft 46 and is there fastened to said shaft by the key 42. A plug 37 fills the tubular shaft 46 at the end thereof. (Shown in Fig. 2). The disk 52 is secured by screws 54 to the flange 51 of the disk 48. The disk 52 has also a series of screw-threaded bosses 55, arranged in a circle. Tubular shafts 56 56 have their end portions screw-threaded to engage in the threaded bosses 41 55 of the disks 36 52, respectively. Nuts 58 59 are mounted on the threaded portions of said tubular shafts to impinge against said disks 36 52 in holding said tubular shafts fixedly secured to the same in the manner shown in Fig. 1. The ironer 60 has its ends concentrically reduced to form hubs, as shown at 61, and these hubs 61 are screw-threaded on their interior surfaces and beveled inwardly to form a ball-bearing channel, as seen in Figs. 1 and 2. A screw-plug 62 engages the screw-threads of the hub 61 and is beveled inwardly, so that between the hub 61 and screw-plug 62 is formed a V-shaped channel in which balls 63 are mounted. On the hub 61 is mounted and fastened by a screw 64 a gear 65, which engages with the teeth 45 of the wheel 43. On the inner end of each ironer 60 is a similar ball-bearing device, and on each tubular shaft 56 there are two ironers 60 of similar construction. Each of these ironers 60 at their inner ends has the semi-annular flanges 66, which together in abutment form an annular flange, as indicated in dotted lines in Figs. 1 and 2.

The tubular shafts 56 have a series of steam passages or openings 67 through them. The peripheral portion of the ironers 60 is formed into a series of integral cone-shaped sections the outer surfaces of which incline in the reverse direction from those of the next adjacent cylinder, and each of these sections has a V-shaped groove spirally arranged, the spiral grooves of one ironer being directed in a right-handed course, while the spiral grooves of the next ironer are directed in a left-handed course, as seen in Figs. 4 and 10. If desired, these grooves may be U-shaped.

In Fig. 9 I show a set of six contiguous ironers 60 at the upper part of my machine and having the construction and arrangement of parts and driving mechanism therefor as above described, while below said six ironers I show a set of three ironers 60 and three brush-cylinders 68 alternately arranged in a

circle. The shells of these brush-cylinders 68 are constructed similar to the shells of the ironers above described, (see Fig. 11,) and the shells of said brush-cylinders 68 rotate around perforated tubular shafts 70, whose ends are fixedly secured to disks similar to the disks 36 52. Each of said brush-cylinders 68 is arranged to receive balls and screw-plugs similar to those used with the ironers, and on each brush-cylinder 68 and on each lower ironer 60 is keyed a gear 71, which engages the teeth of a large internal gear 69, that is rotatably mounted on the projecting hub of a bracket or support of the machine. On the hub of said internal gear is keyed a gear, as indicated by dotted pitch circle 73 in Fig. 9. Said gear 73 meshes with the gear 75, that is loosely mounted on a rotatable shaft 74 of the bracket or support of the machine. On a tubular shaft mounted in the above-mentioned bracket is keyed a gear 72, and said gear 72 meshes with a gear indicated by dotted pitch circle 76, that is keyed upon the driving-shaft 74. The gear 75 has a projecting hub, and on the hub of said gear is keyed a pulley 77, which has a belt connection 79. At the end of the shaft 74 is also keyed a pulley which is driven by a belt connection 78, so that the driving mechanism for said brush-cylinders and their respective ironers is in all respects like that used with the upper set of ironers above described. The brush-cylinders 68 have brushes 80 on their peripheries. In Fig. 9 are also shown thread-guides 81 82 83, suitably mounted. In Figs. 9 and 10 the thread is designated as *a*.

In Fig. 12 I show a modified form of the ironer, in which the periphery is cylindrical instead of being formed with a succession of cone-shaped sections, as seen in Figs. 4 and 10.

Steam passes from a boiler through the pipe 31 into the tubular shaft 19, thence into the chamber 84, (which is formed between the disks 48 and 52,) and from the chamber 84 it passes through all the tubular shafts 56, thence into the chamber 57, thence into the tubular shaft 18, and thence through the steam-pipe 23 into the exhaust. While passing through the tubular shafts 56 it escapes through some of the openings or holes 67 into the ironers 60, respectively, and passes thence through others of the openings or holes 67 into the tubular shafts 56 again, thus heating the ironers 60. In like manner the brush-cylinders 68 and their respective ironers 60 are heated by steam.

The action of the gearing is as follows: The pulley 14 being driven by the belt 16 turns the shaft 5 and with it the gear 17, said pulley and gear being keyed to the shaft, as shown in Fig. 1. The gear 17 turns the gear 20, which is keyed to the tubular shaft 18, and the tubular shaft 18 in turning rotates the disks 33 and 36 with it. As the tubular shaft 46 is secured and keyed at one end to the hub 47 of the disk 36 and at the opposite end to

the hub 53 of the disk 52 and as the tubular shaft 19 is secured and keyed to the hub 49 of the disk 48 and the disk 48 is bolted to the disk 52 it is evident that the rotation of the shaft 5 causes, by means of the gears 17 20, the rotation of the disks 36 and 52, between which the ironers extend. Said gears 43 and 45 cause all the ironers to revolve at a uniform speed. The rotation of the pulley 11 by the band or belt 12 causes the rotation of the gear 13, (to whose hub said pulley 11 is keyed, as shown at 85 in Fig. 1.) The gear 13 is mounted loosely on the shaft 5. The gear 13 meshes with the gear 26, which is keyed at 27 to the hub 44 of the wheel 43. The wheel 43 has the circular series of internal gear-teeth 45, and these engage the gears 65, which are secured by the screws 64 to the hubs 61 of the ironers 60. The gear 13 being of larger diameter than the gear 26 causes the internal gear 43, which meshes with the gears 65, to revolve the ironers at a much higher speed than that of the disks 36 and 52. The thread *a* comes up from the usual sizing-box (not shown) and is guided by the thread-guide 81 to the lower set of alternately-arranged brushes 80 and ironers 60 and thence passing through the thread-guide 82 goes to the set of ironers 60 next above, where the thread is finally polished.

In the lower series of alternately-arranged brush-cylinders and ironers (see Fig. 9) the thread when wet with the sizing is first brushed so as to lay all its projecting fibers straight and then ironed and again brushed and then ironed, and so on, as the parts rapidly revolve and being delivered from the ironers so as to pass straight over the brush-cylinders and from the brush-cylinders so as to pass diagonally over the ironers in the spiral grooves thereof is thoroughly dressed and passes to the upper series of ironers, where it is polished. The thread then passes thorough the thread-guides 83 and is wound on the spools. By having the spiral grooves of one cylinder arranged in a direction opposite to that of the spiral grooves in the next cylinder, as shown in Fig. 10, the threads are drawn to a proper tension and caused to move in alternately-opposite diagonal directions. In this manner the thread is evenly polished all around.

Instead of using steam, as above described, it is obvious that gas may be used or a mixture of gas and air for heating the brush-cylinders and ironers.

This invention is an improvement upon the thread-dressing machine shown and described in Letters Patent of the United States No. 702,786 issued to me June 17, 1902.

I claim as a new and useful invention and desire to secure by Letters Patent—

1. In a thread-dressing machine, the combination of a rotatable shaft properly mounted and driven by power, a gear on said shaft, two hollow shafts arranged in line and mounted

in proper supports, two disks fixed at one end of each of said hollow shafts and provided with a steam-chamber between them, a gear on one of said hollow shafts engageable with the first-named gear, a series of fixed tubular perforated shafts extending between the steam-chambers, a series of ironers rotatably mounted on said perforated shafts and means adapted to rotate all the ironers of the series, substantially as set forth.

2. In a thread-dressing machine, the combination of a rotatable shaft properly mounted and driven by power, a gear on said shaft, two hollow shafts arranged in line and mounted in proper supports, two disks fixed at one end of each of said hollow shafts and provided with a steam-chamber between them, a gear on one of said hollow shafts engageable with the first-named gear, a series of fixed tubular perforated shafts extending between the steam-chambers, rotatable ironers mounted on said perforated shafts, ball-bearing devices between said ironers and their accompanying perforated shafts, and means adapted to rotate all the ironers of said series, substantially as set forth.

3. In a thread-dressing machine, the combination of a rotatable shaft mounted in journal-bearings of the machine-frame, a pulley made fast on said shaft, a belt receiving power to rotate said pulley, a gear fixed upon said shaft, a second gear loosely mounted on said shaft, a second pulley made fast upon the hub of second-mentioned gear, a belt receiving power to rotate the last-mentioned pulley, two hollow shafts coaxially mounted in journal-bearings of the machine-frame, a gear fixed on one of said hollow shafts and engageable with the first-mentioned fixed gear, two disks fixed upon one end of each of said hollow shafts and provided with a steam-chamber between them, a series of fixed tubular perforated shafts extending between the steam-chambers, a series of ironers rotatably mounted upon said perforated shafts, respectively, each of said ironers having its peripheral portion formed into a series of cone-shaped integral sections, and each section provided with a V-shaped groove spirally arranged, a gear fixed at one end of each of said ironers, a disk loosely mounted on the hub of a journal-bearing of the machine-frame and having internal gear-teeth to engage each gear of said ironers, a gear fixed upon the hub of said disk and engageable with the second-mentioned loose gear, substantially as shown and described.

4. In a thread-dressing machine, the combination of two journal-bearings of the machine-frame one of said bearings having an integral projecting hub, with two hollow shafts coaxially mounted in said journal-bearings, two disks fixed upon one end of each of said hollow shafts and provided with a steam-chamber between them, a series of fixed tubular perforated shafts extending between the steam-

chambers, a series of ironers loosely mounted on said perforated shafts and having their ends internally screw-threaded and concentrically beveled, screw-plugs engageable with the screw-threaded ends of said ironers and concentrically beveled, a series of balls located in the channel formed by said bevels of the ironer ends and screw-plugs and bearing on said perforated shafts, a gear fixed upon one end of each of said ironers, an internal gear loosely mounted on the hub of one of said journal-bearings of the machine-frame and arranged to engage the gears on said ironers, a gear fixed upon the hub of said internal gear and adapted to receive power to rotate the same, a second gear fixed upon one of said hollow shafts and adapted to receive power to rotate said disks, substantially as described.

5. In a thread-dressing machine, the combination of a shaft, two brush-cylinders mounted loosely on said shaft, each of which brush-cylinders has at its inner end a half-annular flange, so arranged that one of said flanges abuts the other and they together form a complete circle, a gear fixed at the outer end of said brush-cylinders, and a second gear receiving power to rotate last said gear, substantially as specified.

6. In a thread-dressing machine, the combination of a fixed tubular perforated shaft, two ironers loosely mounted on said shaft, each of which ironers has at its inner end a half-annular flange, so arranged that one of said flanges abuts the other and they together form a complete circle, a gear fixed at the outer end of said ironers, and a second gear receiving power to rotate last said gear, substantially as specified.

7. In a thread-dressing machine, the combination of two hollow shafts arranged in line with each other and mounted in proper sup-

ports, two disks rigidly secured upon one end of each of said hollow shafts and provided with a steam-chamber between them, a series of fixed tubular perforated shafts extending between the steam-chambers, means to rotate said disks, an ironer rotatably mounted on each of said perforated tubular shafts and having its outer surface formed with a series of conically-shaped integral sections whose surfaces incline in one direction and each section of the series provided with a spiral groove, and means to rotate all the ironers in the same direction, substantially, as shown and for the purpose specified.

8. In a thread-dressing machine, the combination of two hollow shafts arranged coaxial with each other and mounted in proper supports, two disks made fast upon the end of each of said hollow shafts and provided with a steam-chamber between them, a series of fixed tubular perforated shafts extending between the steam-chambers, means to rotate said disks, a hollow ironer mounted loosely on each of said tubular shafts, said ironer having a series of conically-shaped integral sections whose surfaces are provided with a groove spirally arranged, the groove of one ironer being arranged in the reverse order to that of the next adjacent ironer, a series of balls properly mounted in each end of the ironers and arranged to contact with the exterior surface of the said tubular shafts, and means to rotate each and all of the said ironers at the same speed and in the same direction, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE A. FREDENBURGH.

Witnesses:

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