D. H. MURPHY.

MEANS FOR SCOURING PIPE.

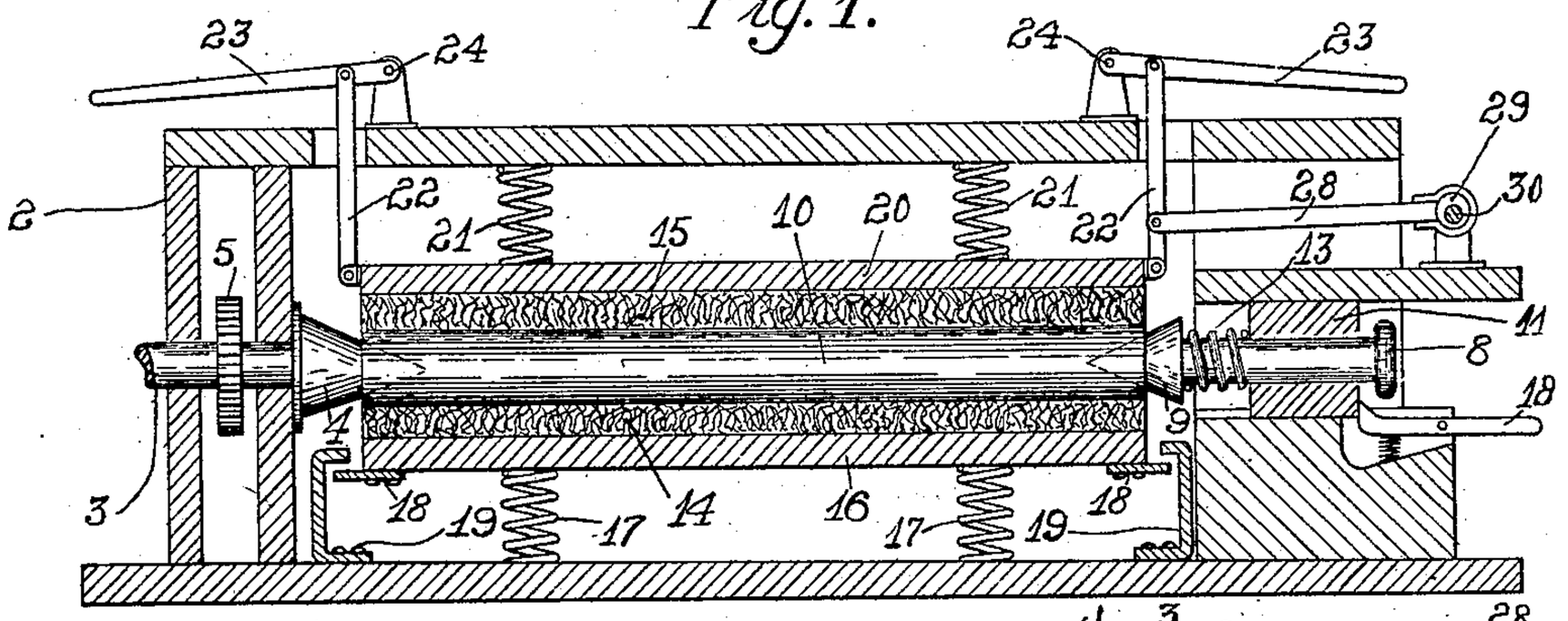
APPLICATION FILED MAR. 24, 1909.

969.179.

Patented Sept. 6, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



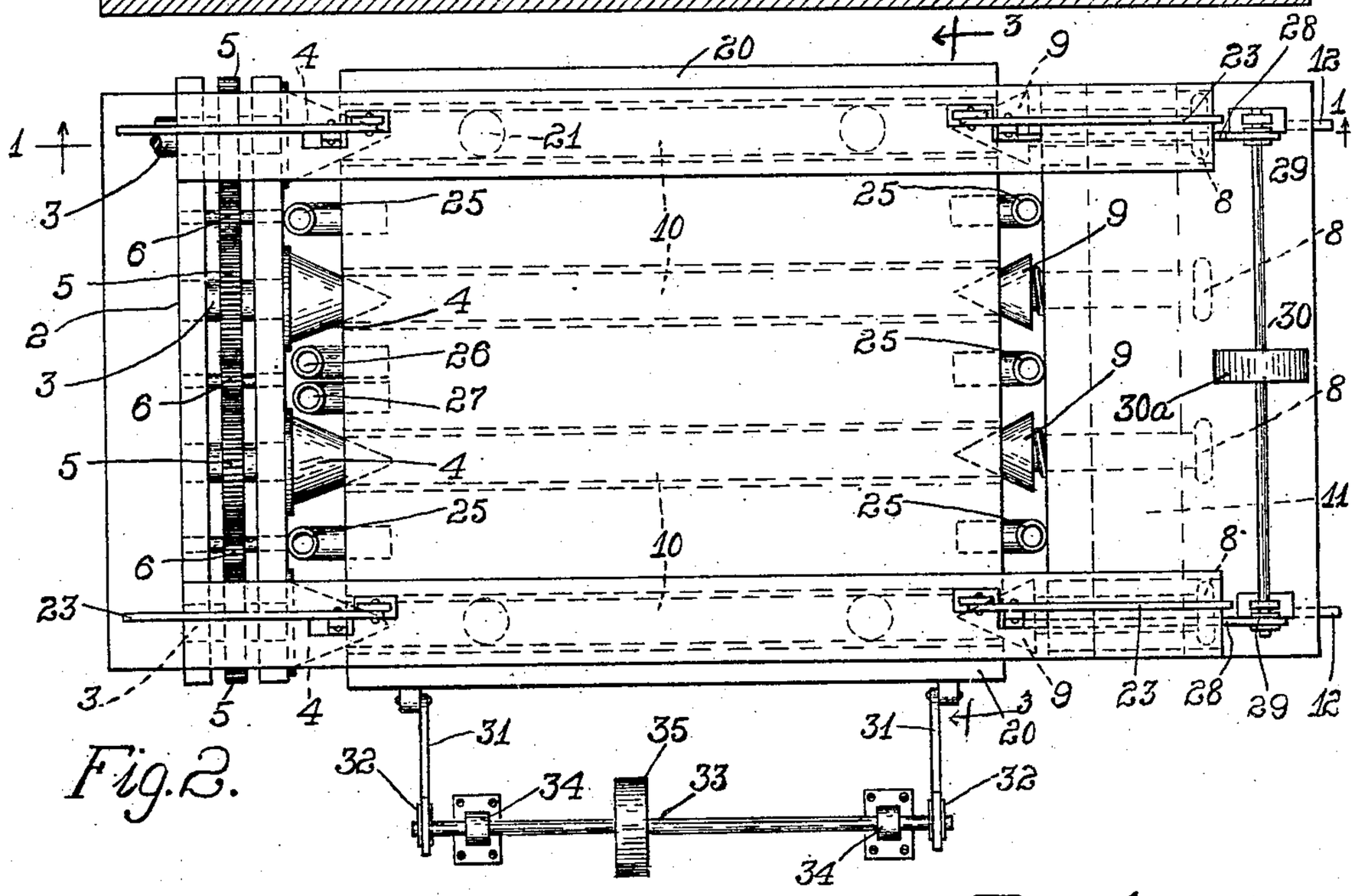


Fig. 2.

Fig. 3.

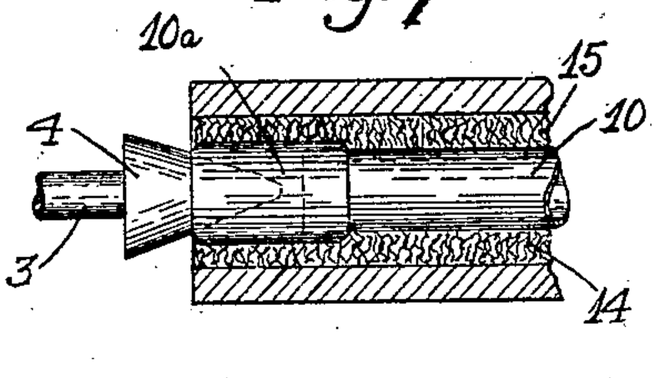
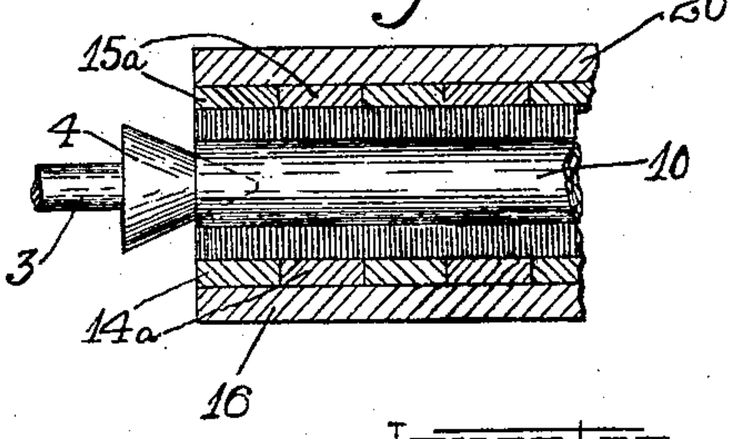


Fig. 4.



Witnesses

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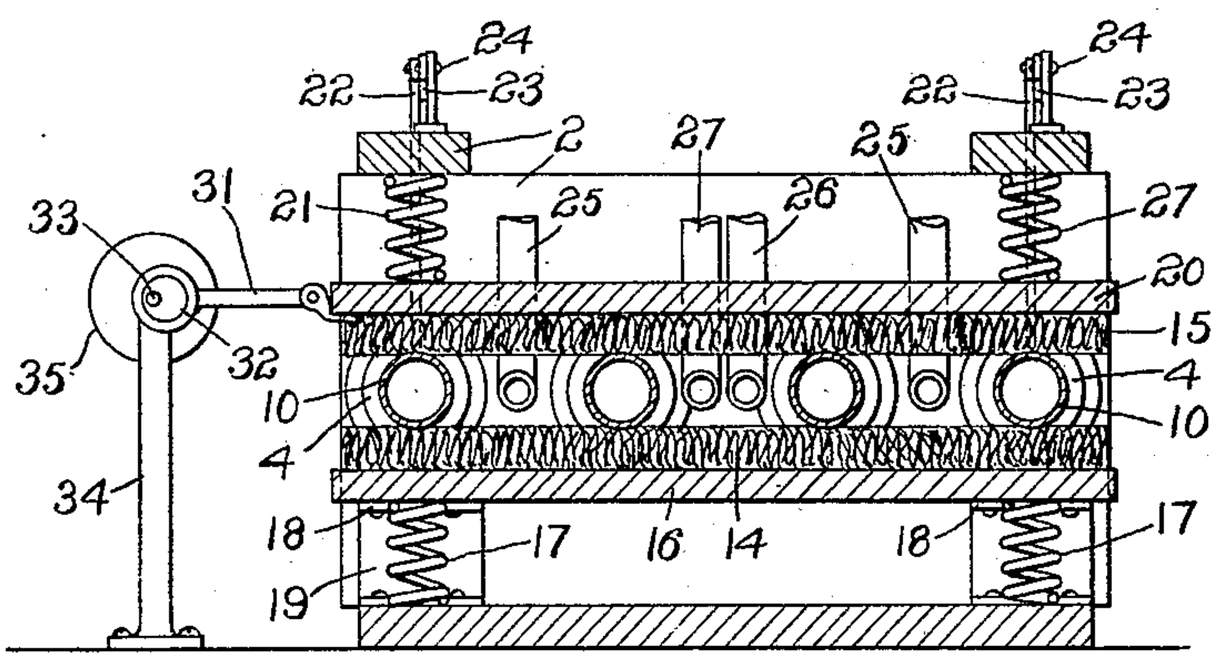
3 SHEETS—SHEET 2.

Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 5.

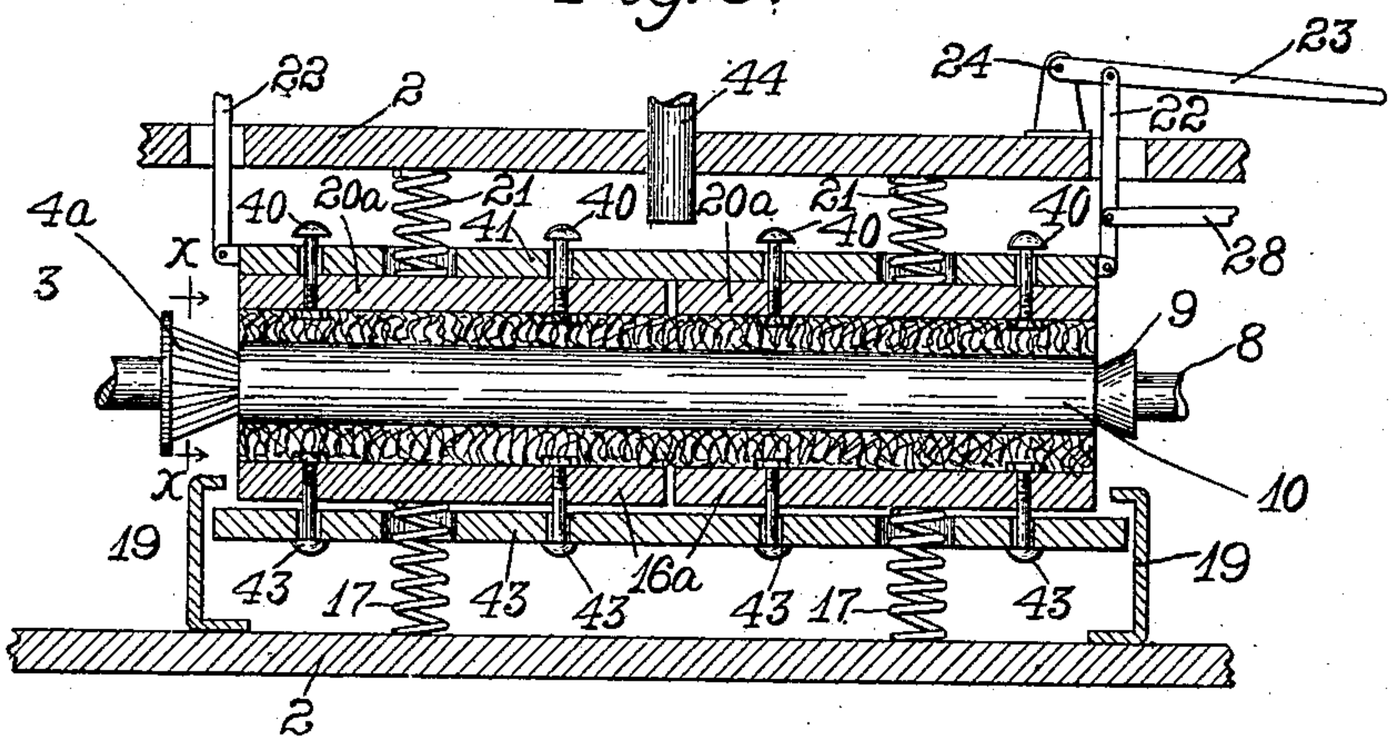

Fig. 6.

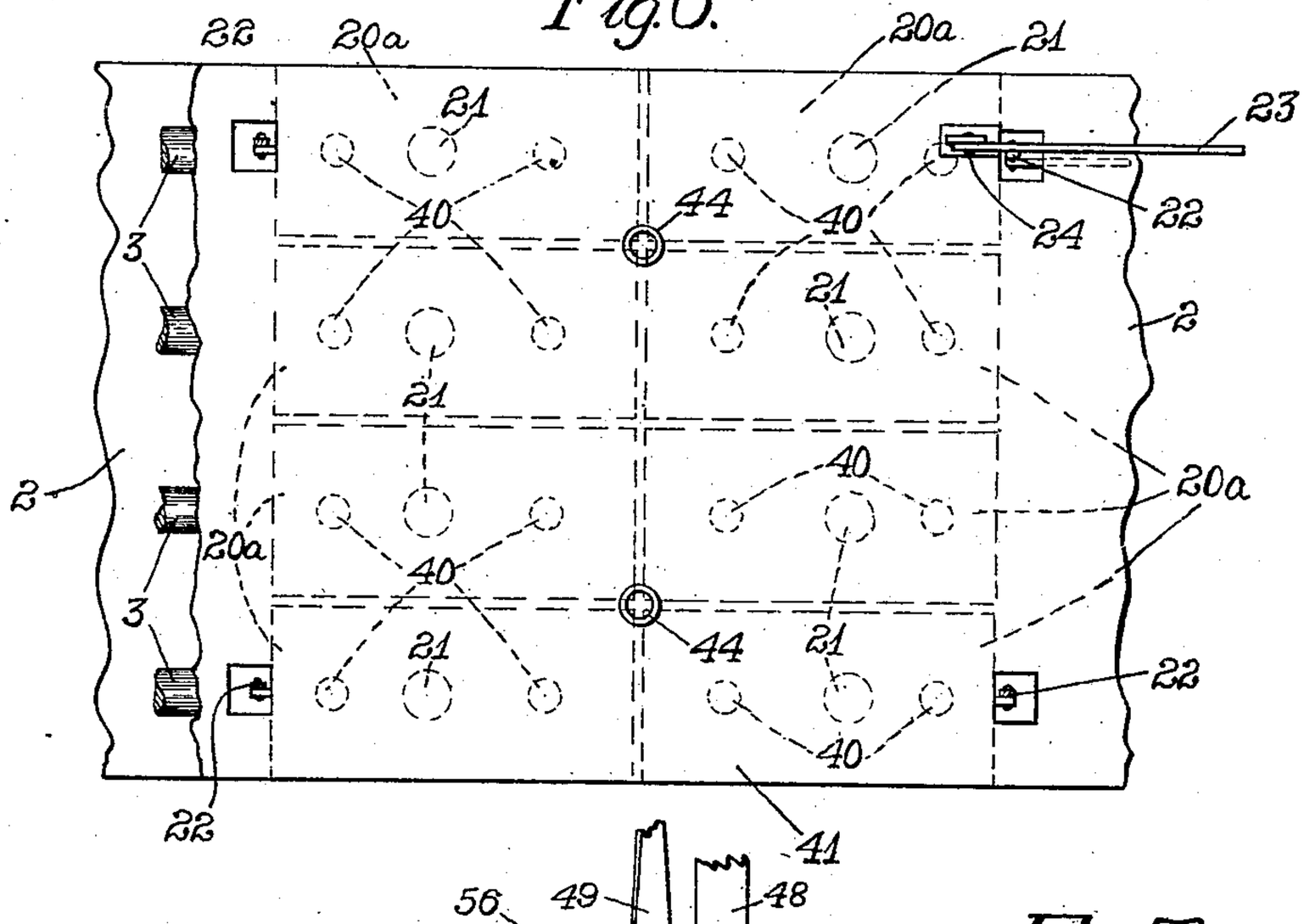

Fig. 8.

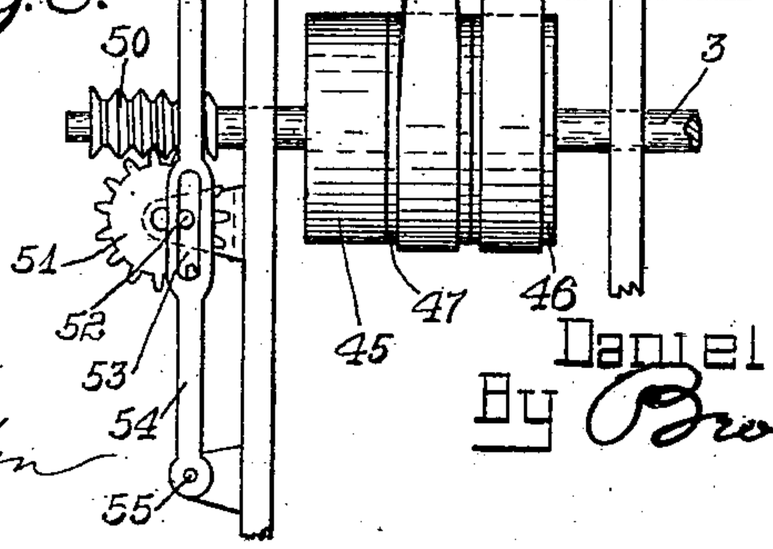

Fig. 7.

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UNITED STATES PATENT OFFICE.

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MEANS FOR SCOURING PIPE.

969,179. Specification of Letters Patent. Patented Sept. 6, 1910.

Application filed March 24, 1909. Serial No. 485,360.

To all whom it may concern:

Be it known that I, DANIEL HAYES MURPHY, a citizen of the United States, residing at New Castle, in the county of Lawrence and State of Pennsylvania, have invented a certain new and useful Improvement in Means for Scouring Pipe, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a means for scrubbing or scouring the outer surface of pipes, as a preparatory step to electroplating the same.

By my invention, the pipes are supported on suitable spindles by which rotation is imparted to them, and while rotating, scrubbers consisting of felt, brushes or the like, are brought into engagement with the outer surface of the pipes and held in such position by pressure sufficient to cause the removal of dirt and other impurity that would interfere with the electrolytic action during the plating operation.

To facilitate the scrubbing and scouring process, abrading material and water are introduced between the scrubbers and brought thereby into contact with the outer surface of the pipes, as a result of which a grinding operation takes place at the outer surface of the pipes, which results in removing the impurity and outer scale that would otherwise prevent properly depositing a metallic coating electrolytically upon such surface. While any suitable abrading material may be used, I find it convenient to use ordinary sharp sand, and this may be fed between the scrubbers, mixed with the water, or it may be fed separately, as desired.

The several drawings describing my invention are as follows: Figure 1 is a vertical sectional view through the machine, taken along the line 1, 1 of Fig. 2; Fig. 2 is a plan view of the machine; Fig. 3 is a sectional view taken on line 3—3 of Fig. 2; Fig. 4 shows, in sectional view, one of the pipes and an arrangement of scrubbers consisting of bristle brushes; Figs. 5 and 6 show in views similar to Figs. 1 and 2 a modified form of my scrubbing machine; Fig. 7 shows in transverse section a modified form of driving center; Fig. 8 shows the means employed for automatically reversing the direction of rotation of the pipes; and Fig. 9 is a sectional view through the scrubbers of one of the pipes, showing the relation of the pipes to the scrubbers when a coupling is located on the end of the pipe and treated at the same time as the pipe.

Similar reference characters refer to similar parts throughout the several views.

As shown in Figs. 1, 2 and 3 my machine consists in a framework 2, in which a plurality of spindles 3 are rotatably mounted. Each spindle carries at its right hand end a cone-shaped member or center 4, adapted to receive one end of a pipe to be treated. Each spindle has rigidly secured thereto a gear 5, which gears are connected together, so as to revolve in the same direction, by intermediate gears 6. One of the spindles 3 has secured thereto tight pulleys 45 and 46 and a loose pulley 47 between them. A straight belt 48 and a crossed belt 49 are arranged to drive the pulleys from any suitable source of power not shown. This spindle 3 also carries a worm 50 engaging a worm wheel 51, which carries a pin 52 engaging a slot 53 in a lever 54 pivoted to the framework at 55. The lever 54 has pivoted to its upper end a shifter bar 56 adapted to move the belts 48 and 49 from the pulleys 46 and 47 to the pulleys 47 and 45, or vice versa, as the worm wheel 51 is rotated. By this means I provide that the pipes are automatically rotated first in one direction and then in the opposite direction for desired intervals. The framework 2 also supports at the right hand side of the machine a plurality of spindles 8, corresponding in number and location, transversely of the machine, with the spindles 3. Each spindle 8 has secured to its left hand end a supporting center 9, adapted to engage the right hand end of the pipe 10 to be treated. All of the spindles 8 are mounted in a bar 11, which is slidably supported in the framework 2 in such a manner that by removing the latches 12 from the rear edge of the bar 11, the bar may be moved to the right, thus releasing all of the pipes 10. Each spindle 8 may be moved to the right in the bar 11, against the action of a spring 13, in order to permit the individual adjustment of any one of the pipes 10 while the bar 11 is in position to

hold the remaining spindles 8 in engagement with the corresponding pipe. The springs 13 are of sufficient strength to properly retain the pipe 10 in position against the scrubbing action.

In order to scrub or scour the pipes located and rotated as described above, use is made of two scrubbers 14 and 15, which are located below and above the pipes, respectively. The scrubbers may consist of felt, as indicated in Figs. 1, 2, 3 and 9 of brushes, as indicated in Fig. 4, or of any similar material that will cause a grinding action between the abrading material employed and the surface of the pipes as they are rotated.

The scrubber 14 is supported under the pipes 10 by a plate 16, which is held in position by springs 17 supported from the framework of the machine. The plate 16 has secured thereto stops 18, adapted to cooperate with members 19 supported from the framework of the machine in such a manner that the plate 16 cannot be moved beyond certain limits in either direction vertically.

The upper scrubber 15 is secured to the under side of a plate 20 and adapted normally, by means of springs 21, to be forced downward into engagement with the pipes 10. The plate 20 has pivotally connected thereto links 22, to the other ends of which levers 23 pivoted to the framework at 24, 24 are connected. The levers 23 constitute a means by which the plate 20 may be raised against the action of the springs 21 to permit the removal of the pipes 10 from the machine. When the plate 20 is raised for this purpose, the bar 11 is moved to the right, after depressing the catches 12, and the pipes 10 are then free to be removed from the supports 4, and from the machine. This position of the plate 20 also permits the introduction of a new set of pipes 10, which are held in position by the replacing of the bar 11 and adjustment of the spindles 8, as required to properly engage such pipes, after which the levers 23 are moved to a position to permit the springs 21 to force the scrubber 15 into engagement with the pipes 10.

In order to introduce water and abrading material between the scrubbers 14 and 15, supply pipes 25 are provided, which serve to direct the water and abrading material between such scrubbers in such a manner that the rotation of the pipes 10 will cause such abrading material to be engaged between the pipes 10 and the scrubbers, and therefore scour or scrub the outer surface of the pipes. If desired, the water may be introduced by one pipe, as shown at 26, while the abrading material may be introduced in dry condition by a second pipe, as shown at 27. If sand is used as the abrading material, air may be used to advantage to cause the introduction of such sand between the scrubbers by means of the pipe 27. My scrubbing machine may be used with any desired combination of scouring or abrading material. For example, sand or finer grinding material may be used alone, or water may be used alone, or the machine may be used without either water or abrading material.

The right hand links 22 have pivotally connected to them links 28, the other ends of which engage eccentrics 29, secured to and driven by shaft 30 supported in suitable bearing from the framework of the machine. The shaft 30 is provided with a pulley 30[a] and it is clear that rotation of this pulley will result in the operation of the eccentrics 29 to cause reciprocation of the links 28 and the consequent longitudinal shifting of the plate 20 which, in reality, hangs from the pivot points between the links 22 and the levers 23. The plate 20 at its forward edge also has pivotally connected thereto the links 31 which are connected with eccentrics 32 secured upon a shaft 33 mounted in bearings 34, as best shown in Fig. 3. The shaft 33 is provided with a pulley 35 and it is clear that rotation of this pulley will result in reciprocation of the links 31. The various link connections which affect the plate 20 have sufficient clearance to permit of the simultaneous operation of the two sets of eccentrics. It will be noted that the plate 20 does not shift to a very considerable extent, but this arrangement is desirable so that the wear upon the scrubber carried by the plate may be equalized and distributed.

The detail shown in Fig. 9 illustrates one of the pipes 10, to which a coupling 10[a] is secured in position to be scoured or scrubbed. It is frequently desirable to treat the pipes with the couplings in place, and since the stock threads on the pipe are almost invariably right handed, it is desirable to secure rotation of all of the spindles 3 in the same direction as described above.

As shown in Fig. 4, brushes 15[a] may be secured to the plate 20 to constitute the upper scrubber, and similar brushes 14[a] may be secured to the plate 16 to constitute the lower scrubber, if desired.

In the modification of my machine shown in Figs. 5 and 6, which views are taken similarly to Figs. 1 and 2, the scrubbers are divided into sections, in order that each pipe may receive special treatment if necessary. It sometimes occurs that some of the pipes are not straight, and if such a pipe is placed in the machine with other pipes that are straight, it is desirable that the bent pipe may receive a proper scrubbing or scouring without interfering with similarly treating the other pipes. As shown in this modifi-

cation, the several scrubbers 20ª are secured to a common plate 41 by means of bolts 40. The bolts 40 are so secured in the scrubbers 20ª that the scrubbers may have some movement relatively to the plate. A spring 21 is provided for each scrubber 20ª in such a manner that by its thrust against the framework 2, it tends to move the corresponding scrubber 20ª down against the surface of the corresponding pipe. It is to be noted that the scrubbers associated with one pipe are entirely separate and distinct from the scrubbers associated with each of the other pipes; also, that two scrubbers are shown as operating upon the top of one pipe. It is apparent that instead of two scrubbers, a greater number may be arranged in connection with each pipe, if desired. The plate 41 has secured to its ends links 22, which operate in a manner similar to perform the same function already described in connection with the form of my machine shown in Figs. 1 and 2. The amount of motion of the scrubbers 20ª relatively to the plate 41 permitted by the bolts 40 is such as to permit the scrubbers 20ª to conform to any irregularities that may exist in the conformation of the pipe without, however, interfering with common control of the scrubbers 20ª by the plate 41 when it is desired to raise the scrubbers out of engagement with the pipes 10 to remove the treated pipes and insert a second set for treatment. In a similar manner, separate scrubbers 16ª are provided beneath the pipes 10, each being provided with its individual spring 17 by which it is forced upward against the surface of the pipe. The scrubbers 16ª are secured to the plate 42 by bolts 43, in a manner similar to the securing of the scrubbers 20ª to the plate 41. The plate 41 therefore prevents displacement of the scrubbers 16ª relatively to each other, and also prevents the springs 17 moving the scrubbers too far in a vertical direction when the pipes 10 are removed from the machine by the cooperation of the stops 19 with the ends of such plate. In this modification of my invention, water and abrading material, either singly or together, may be supplied to the top of the plate 41 by means of pipes 44, the openings in the plate serving to equalize the distribution to the various scrubbers.

The center 4ª shown in Fig. 5 is of a form adapted for use under certain conditions, requiring considerable driving force to rotate the pipes. The conformation as indicated in Fig. 7, which is a sectional view taken along the line *x*—*x* in Fig. 5, shows the manner in which the surface of the center is toothed, or corrugated, to insure the positive engagement of same with the pipes.

While my scrubbing machine is shown in the drawings as occupying a horizontal position, it is to be understood that it may be used in other positions if desired, as, for instance, in a vertical position, or in any other position in which it may be found convenient to dispose the machine.

While I have shown my invention in the particular embodiment herein disclosed, I do not, however, limit myself to this construction, and desire to claim broadly any equivalent modification that will suggest itself to those skilled in the art.

What I claim is:

1. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, a scrubbing member extending over each side of said pipes, and means for supplying abrading material between such scrubbing members.

2. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, a scrubbing unit on each side of said pipes, means for bringing said scrubbing units into engagement with the pipes, and means for shifting such units in their own planes relatively to the supports.

3. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, a scrubber on each side of said pipes, means for bringing scrubbers into engagement with the pipes, means for shifting such scrubbers in their own planes relatively to the supports, and means for supplying abrading material and water to such scrubbers.

4. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, means for bringing scrubbers into engagement with the pipes, and means for moving such scrubbers transversely of the pipes.

5. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, means for bringing scrubbers into engagement with the pipes, and means for moving such scrubbers longitudinally and transversely of the pipes.

6. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, a scrubber on each side of said pipes, resilient means for bringing scrubbers into engagement with the pipes, means for shifting such scrubbers in their own planes relatively to the supports, and means for supplying abrading material and water to such scrubbers.

7. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, and scrubbing material supported by springs under the pipes and in engagement therewith for scouring the pipes as they are rotated.

8. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, and a scrubbing unit extending transversely of the pipes

and having its surface in engagement therewith for scouring the pipes as they are rotated, the centers at the other end of the pipes being removable to permit the removal of the pipes from or their introduction into the machine.

9. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes as they are rotated, and common means for withdrawing the centers from the other end of the pipes to permit the removal of the pipes from or their introduction into the machine.

10. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes as they are rotated, and common means for withdrawing the centers from the other end of the pipes to permit the removal of the pipes from or their introduction into the machine, such centers being capable of independent and separate withdrawal in such common means.

11. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, a scrubbing unit extending transversely under the pipes and in engagement therewith for scouring the pipes as they are rotated, and a scrubbing unit extending transversely over the pipes and held in engagement therewith, the centers at the other end of the pipes being removable to permit the removal of the pipes from or their introduction into the machine.

12. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes as they are rotated, scrubbing material supported over the pipes and held in engagement therewith, and common means for withdrawing the centers from the other end of the pipes to permit the removal of the pipes from or their introduction into the machine.

13. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes as they are rotated, and scrubbing material supported over the pipes and held in engagement therewith, such centers being capable of independent and separate withdrawal in their support.

14. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, a scrubbing unit extending transversely of the pipes and in engagement therewith for scouring the pipes as they are rotated, and means for feeding sand and water to such scrubbing unit.

15. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, a scrubbing unit extending transversely of the pipes and in engagement therewith for scouring the pipes as they are rotated, the centers at the other end of the pipes being removable to permit the removal of the pipes from or their introduction into the machine, and means for feeding sand and water to such scrubbing unit.

16. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, a scrubbing unit extending transversely under the pipes and in engagement therewith for scouring the pipes as they are rotated, a scrubbing unit extending transversely over the pipes and held in engagement therewith, and means for feeding sand and water between the upper and lower scrubbing units.

17. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, a scrubbing unit extending transversely under the pipes and in engagement therewith for scouring the pipes as they are rotated, a scrubbing unit extending transversely over the pipes and held in engagement therewith, the centers at the other end of the pipes being removable to permit the removal of the pipes from or their introduction into the machine, and means for feeding sand and water between the upper and lower scrubbing units.

18. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes as they are rotated, scrubbing material supported over the pipes and held in engagement therewith, and eccentrics for moving the scrubbing material longitudinally of the pipes.

19. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes

as they are rotated, scrubbing material supported over the pipes and held in engagement therewith, the centers at the other end of the pipes being removable to permit the removal of the pipes from or their introduction into the machine, and eccentrics for moving the scrubbing material longitudinally of the pipes.

20. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes as they are rotated, scrubbing material supported over the pipes and held in engagement therewith, and eccentrics for moving the scrubbing material transversely of the pipes.

21. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes as they are rotated, scrubbing material supported over the pipes and held in engagement therewith, the centers at the other end of the pipes being removable to permit the removal of the pipes from or their introduction into the machine, and eccentrics for moving the scrubbing material transversely of the pipes.

22. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith, for scouring the pipes as they are rotated, scrubbing material supported over the pipes and held in engagement therewith, and eccentrics for moving the scrubbing material longitudinally and transversely of the pipes.

23. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes as they are rotated, scrubbing material supported over the pipes and held in engagement therewith, the centers at the other end of the pipes being removable to permit the removal of the pipes from or their introduction into the machine, and eccentrics for moving the scrubbing material longitudinally and transversely of the pipes.

24. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, and a plurality of independently movable scrubbers above the pipes for scouring the same.

25. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, a plurality of independently movable scrubbers above the pipes, and a plurality of independently movable scrubbers beneath the pipes, such scrubbers adapted to scour the pipes.

26. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, a plurality of scrubbers in engagement with the pipes for scouring the same, and individual means for bringing each scrubber into engagement with the pipes.

27. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, a plurality of scrubbers in engagement with the pipes for scouring the same, individual means for bringing each scrubber into engagement with the pipes, and a common means for removing the scrubbers from the pipes.

28. In a machine for scouring pipes, supports for the pipes, scrubbers in engagement with the pipes, means for rotating the pipes, and means for periodically reversing the direction of such rotation.

29. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, scrubbers for the pipes, means for supplying abrading material to such scrubbers, and means for periodically reversing the direction of such rotation.

30. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, scrubbers for the pipes, means for moving such scrubbers relatively to the supports, and means for periodically reversing the direction of such rotation.

31. In a machine for scouring pipes, supports for the pipes, means for rotating the pipes, scrubbers for the pipes, means for moving such scrubbers longitudinally and transversely of the pipes, and means for periodically reversing the direction of such rotation.

32. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes as they are rotated, scrubbing material supported over the pipes and held in engagement therewith, the centers at the other end of the pipes being removable to permit the removal of the pipes from or their introduction into the machine, and means for periodically reversing the direction of such rotation.

33. In a machine for scouring pipes, centers for supporting the pipes, gearing connected with the centers at one end of the pipes for rotating such pipes, scrubbing material supported under the pipes and in engagement therewith for scouring the pipes as they are rotated, scrubbing material supported over the pipes and held in engage-

ment therewith, the centers at the other end of the pipes being removable to permit the removal of the pipes from or their introduction into the machine, cranks for moving the scrubbing material transversely of the pipes, and means for periodically reversing the direction of such rotation.

In witness whereof, I hereunto subscribe my name this 20th day of Mch., A. D. 1909.

DANIEL HAYES MURPHY.

Witnesses:
H. L. SHERMAN,
H. G. MILLER.