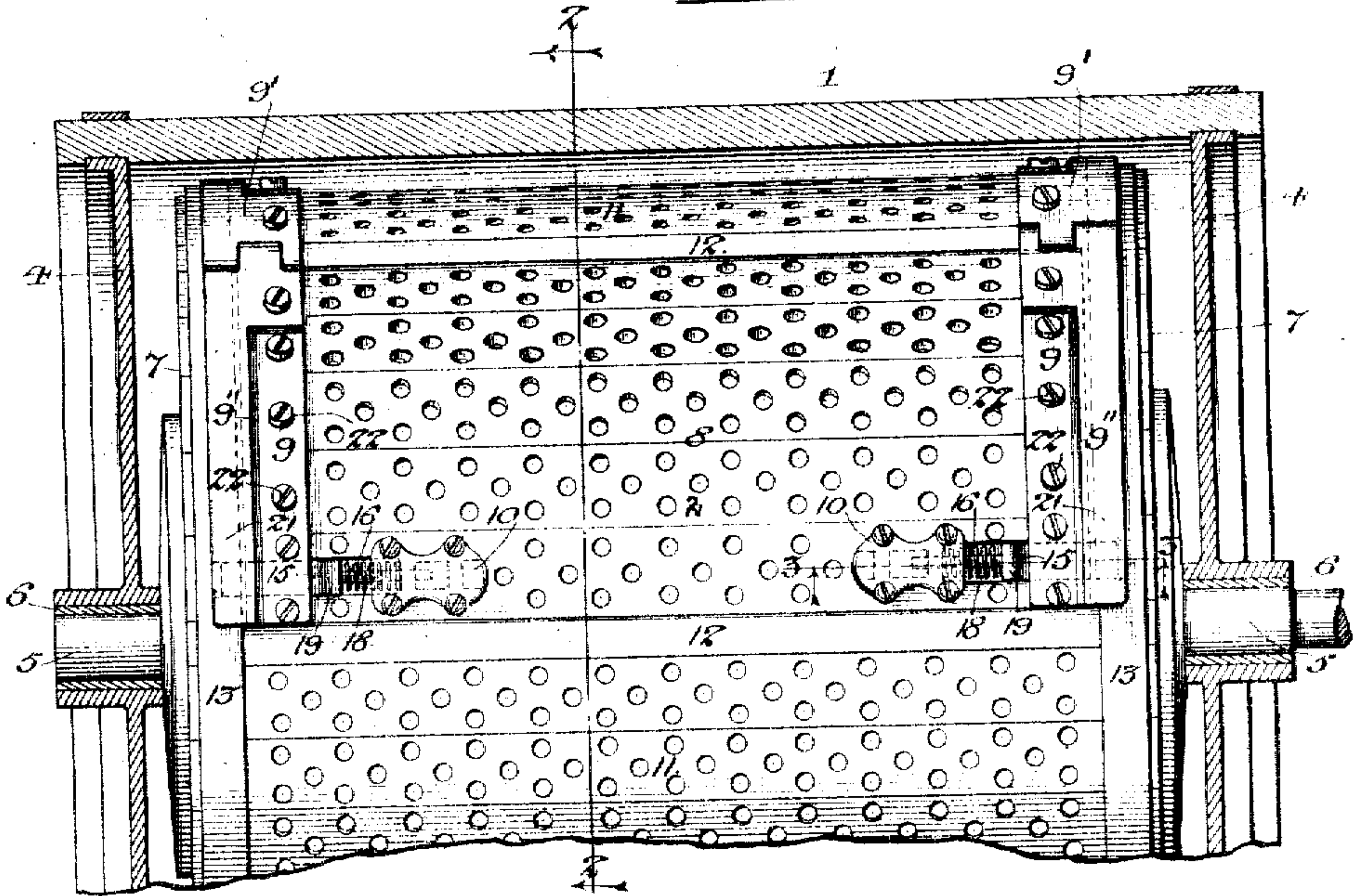


F. SNOW.  
WASHER CYLINDER DOOR.  
APPLICATION FILED FEB. 19, 1904.

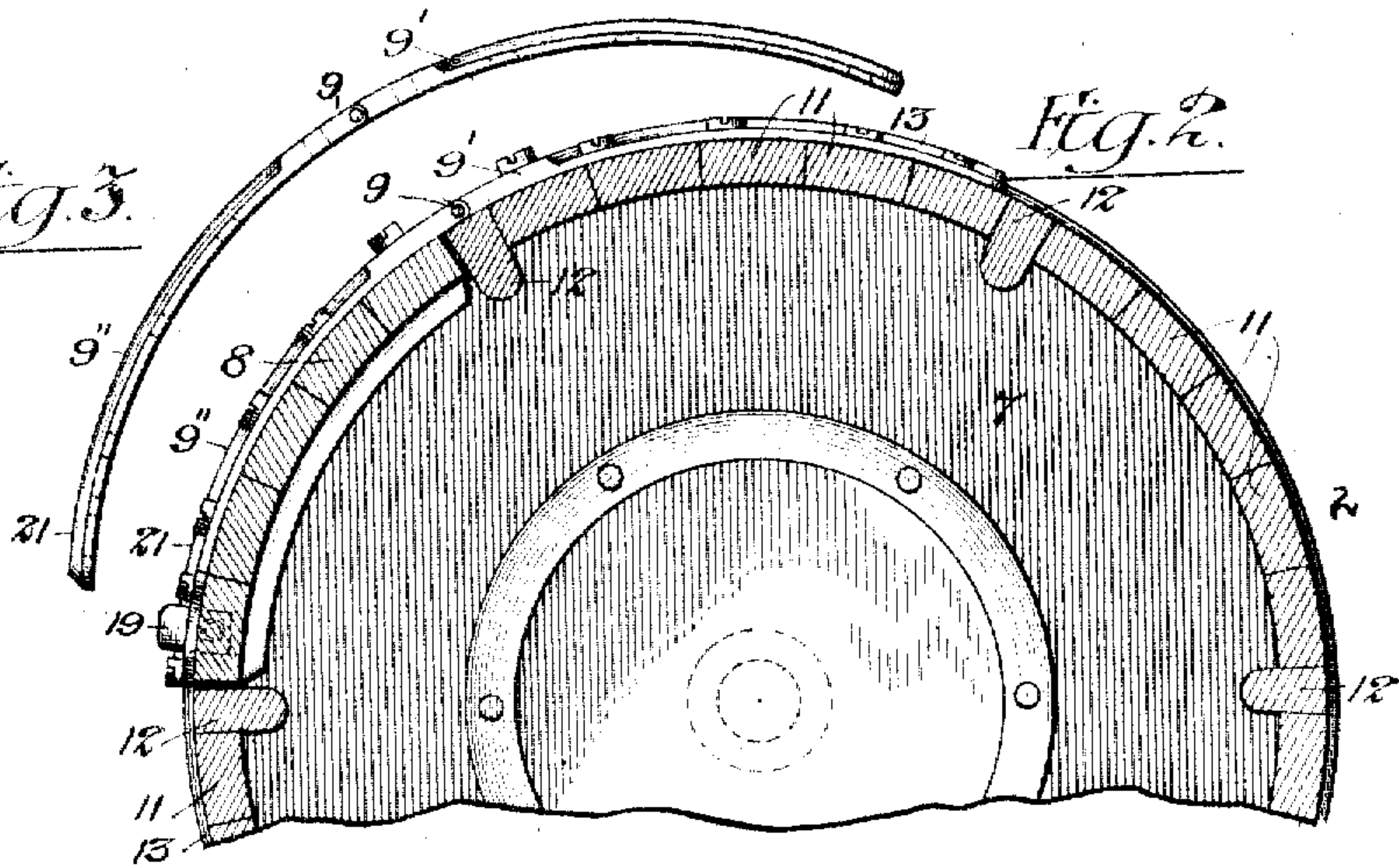
Patented Feb. 9, 1909.

912,041.

*Fig. 1.*

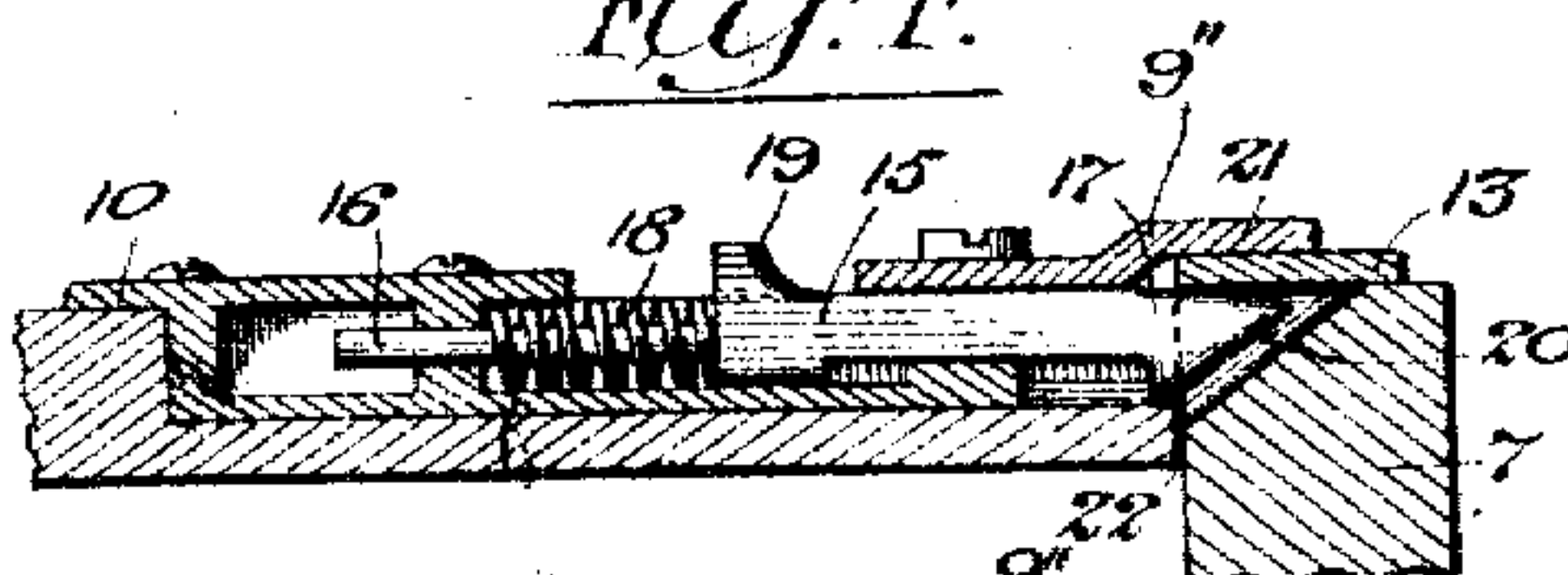


*Fig. 3.*

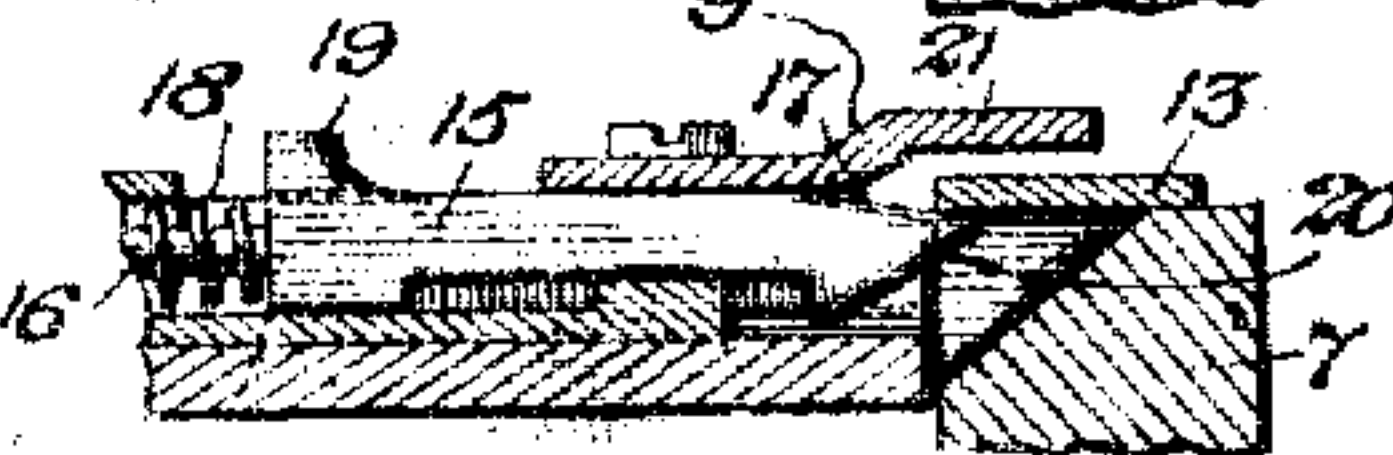


*Fig. 2.*

*Fig. 4.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

FREDERICK SNOW, OF CHICAGO, ILLINOIS, ASSIGNOR. BY MESNE ASSIGNMENTS, TO  
CONKLING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## WASHER CYLINDER-DOOR.

No. 912,041.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed February 19, 1904. Serial No. 194,376.

*To all whom it may concern:*

Be it known that I, FREDERICK SNOW, a citizen of the United States, residing in the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Washer Cylinder-Doors, of which the following is a specification.

My invention relates to rotary washing machines, such as are used in large laundries and has special reference to the cylinder doors of such machines and to improvements upon the devices that are used in securing them in position. The chief members of a washer are, the cylindrical shell and the perforated, rotary cylinder, which is mounted within the shell. The cylinder is usually alternately rotated to thoroughly agitate the garments within it and subject them to the action of the washing fluid in the shell. The cylinder of the washing machine must be strong, to withstand the shocks and strains to which it is subjected, and this is particularly true with respect to that part of it which constitutes the door. This door for the cylinder is usually of greater width than length. It is hinged upon the cylinder and is provided with latches at its free edge to hold it shut and allow the cylinder to be rotated within the shell. The shell containing it is little larger than the cylinder, and this makes it necessary to secure the door by hinges and latches or locks that are light and compact. The hinges and latches of washer cylinder doors, as they have been used for years past, have been such that the bursting open of the doors has been of quite frequent occurrence, and the driving mechanism used is of such power that the breaking of the door locks always results in serious damage to the machine. It is necessary that the latches, hinges and stops upon cylinder doors shall be particularly strong and effective, otherwise they will not sustain the blows upon the door, the effect of centrifugal force thereon, and other strains. The walls of the cylinder and the door as well are usually composed of wooden staves, and the only suitable places for locks or latches are at the ends of the door where the bolts may engage the metal hoops that are used for binding the staves upon the heads of the cylinder.

The ordinary spring latch used on cylinder

doors is provided with a bolt having a straight outer face or top and a beveled underside. When the door is closed, the beveled end of the bolt works against the hoop and is forced back thereby. The bolt then springs beneath the hoop on the cylinder, and cooperating with a suitable stop, serves to secure the door. The ordinary latch would meet the requirements if it were not for wear between the parts; but in point of fact it fails because of such wear. The stops referred to are usually placed on the door itself and are metal parts that project from the free edge thereof to strike or bear against the wooden rib that frames the lower side of the door opening. Thus metal is made to bear upon wood, and the frequent opening and closing of the door (the door is usually slammed shut) causes the stops to sink or wear into the wood to such an extent that the outer faces of the door bolts will no longer stand close against the inner sides of the cylinder hoops. Thus it happens that a cylinder door which fits and locks snugly when first put into use, quickly becomes loose and will soon vibrate at every turn or movement of the cylinder. In other words lost motion quickly develops at the free edge or end of the door, with the result that the force of every blow to which the door is subjected from the interior of the cylinder has added to it the momentum of the door itself, until the capacity of the lock to withstand the blow is exceeded, and the door is thrown or burst open, thereby allowing the garments to escape from the cylinder and become entangled upon the exterior thereof, or torn between the cylinder and the shell. Also, when the door is burst open in this manner, it is generally broken by contact with the interior of the shell, frequently injuring or breaking the shell itself. No adequate idea of the strain or wear upon the parts of a washing machine cylinder can be derived from mere observation of a machine in operation, inasmuch as the cylinder is then in rapid rotation and is completely hidden within the shell. This doubtless accounts for the crudity of the fastenings hitherto employed, for fastenings that appear to be sufficiently strong and tight when the cylinder is stationary, develop weaknesses when the cylinder is rotated, or after considerable use.



The object of my invention is to improve the construction of rotary washing machines, and particularly to provide improved fastenings for the doors of the cylinders of such machines.

A special object of my invention is to provide a cylinder-door latch that shall positively prevent vibration of the door, while the locks are engaged and which will automatically take up its own wear.

My invention consists in the combination of a washer cylinder and its door with beveled top bolts upon the door, stops upon said door, and stationary parts upon the cylinder proper that are engaged by the stops and bolts, said bolts serving to draw said stops firmly together, and further, my invention consists of an improved hinge and lock for washer cylinder doors, and it also consists in details of construction and in combination of parts all as hereinafter described and pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, and in which:—

Figure 1 is an elevation of a washing machine embodying my invention, the shell being broken away to disclose the cylinder with its hinges and latches. Fig. 2, is a transverse section on line 2--2 of Fig. 1; Fig. 3, is a side view of one of the hinges. Fig. 4, is an enlarged sectional view of my improved locking device, on line 3--3 of Fig. 1, showing the bolt and other parts in locked position; and Fig. 5, is a similar view showing the bolt partially withdrawn.

As shown in the drawings, 1 represents the shell of the washing machine. This is a cylindrical tub or vessel, having a suitable opening in its top to permit access to the cylinder, 2, which is arranged within it. The ends, or heads, 4 of the shell are provided with bearings, 6, for the gudgeons, 5, on the ends of the cylinder. The cylinder, like the shell, is provided with a door opening, in order that the cylinder may be readily filled with and emptied of garments. The door opening extends from one head, 7, of the cylinder to the other. The staves, 11, are bound upon the heads, 7, by the hoops, 13, 13, and therefore portions of these hoops serve to frame the ends of the door opening. The heavy ribs, 12, 12, are preferably used to frame the upper and lower sides of the door opening.

The door is composed of the staves, 8, like the staves, 11 (but shorter) and the hinge leaves 9, the staves and leaves being bound together by a plurality of screws or bolts, 22. The staves and hinge-leaves therefore make up a rigid door, and as the leaves are curved on the door it conforms to the curve of the rest of the cylinder and to the hoops, 13, thereon. The fixed leaves, 9, of the

hinges are identical with those forming parts of the door and are bound upon the staves, 11, of the cylinder by screws or bolts similar to those used in the door. The hinges at the opposite ends are identical. Therefore one hinge pattern serves both, the two leaves of a hinge being of the same length, so that the hinge may be turned and have either of its leaves fastened to the door. The hinges are preferably brass castings, and as this metal is comparatively soft, it is necessary to form the hinges in such a way as to give them maximum strength. To this end the leaves of the hinges, except at the hinge points, have depressions whereby each leaf is provided with a substantially vertical flange or web portion, 9'', that serves to stiffen the leaf. Hinge leaves simply turned up at their outer edges possess sufficient strength for the purpose, but I go beyond such construction and provide each leaf of the hinge with a horizontal extension or flange, 21, that overlaps the adjacent hoop. This flange performs two very important offices, first, it effectually closes the crack between the end of the door and the cylinder, preventing the escape of small articles, such as collars or cuffs from the cylinder; and second, it provides a wide strong stop and bearing for the door, adapted to rest upon the hoop. The flange parts, 21, upon the door leaves of the hinges are made to thus rest upon the curved hoops, when the door is closed, and in this manner I provide strong and durable stops for the door, which stops will wear indefinitely and cannot be easily broken, even though a great force is used in closing the door. A particular advantage accruing from this construction of the door and its hinges is that there are no metal parts that strike or bear against wooden parts of the cylinder, metal, at every point, being opposed to metal. There is, therefore little likelihood of the development of lost motion or looseness in the door. This being the case, I am able to secure the door by very simple bolts, locks or latches. The locks or latches are placed in the lower piece or stave of the door, which is recessed to receive them.

10 represents one of the latch cases which is preferably integral with the hinge part. This is set into the recess of a stave, 8, and holds the bolt, 15, which has a shank, 16, encircled by a spring, 18, in said case. The spring tends to force the bolt outward. The outer end of the bolt is held in the case by the hinge-leaf, 9, which bridges the recess containing the bolt.

19 is a finger-piece for withdrawing the bolt. The bolt is like unto most latches of the kind in all respects save that in addition to the usual beveled underside, 20, of steep pitch, it is provided with a low-pitched bevel or incline, 17, upon its upper or outer face. Referring to Figs. 4 and 5, it will be seen



that this permits the point of the bolt to enter beneath the hoop, 13, before the top-flange, 21, on the door, comes to rest upon the top or outer face of the hoop. As soon as the point of the bolt has struck beneath the hoop, the bolt will be forced out by the spring, until it wedges the flange, 21, down upon the hoop. After the door is closed, the force of the spring is continuously exerted to wedge both parts upon the hoop and thus tightly and snugly secures the door and prevents even slight vibration thereof with respect to the hoops and staves of the cylinder. It is obvious that the beveled outer face of the bolt insures the taking up of all wear between the metal parts. The outer bevels of the bolts cannot be great and should never exceed ten to fifteen degrees. Greater inclination would render it necessary to use stronger springs, making it difficult to withdraw the bolts to open the door.

The essence of my invention consists in the employment of the metal stops upon the door to engage with the metal hoops, or like metal parts or stops upon the cylinder, taken together with the wedge-like bolts adapted to draw such stops firmly together. This being the case, I do not confine my invention to the specific constructions herein shown and described.

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

1. In a rotary washing machine, the cylinder, its hoops and its door in combination with door hinges having leaves lapping upon said hoops and drawing bolts on the door to engage said hoops and bind said leaves upon

them, substantially as and for the purpose specified.

2. A rotary washer cylinder provided with a door opening, framed at its sides by metal parts, in combination with a door, hinges having vertical and horizontal flanges upon their leaves, said horizontal flanges being adapted to rest upon said metal parts and suitable door latches, substantially as and for the purpose specified.

3. The combination of a wooden cylinder, having metal hoops at its ends, with a wooden door having metal flanges at its ends to engage said metal hoops, and close the cracks between the door and the cylinder heads, and spring pressed bolts upon said door, said bolts having inclined surfaces upon their outer ends to firmly wedge said metal flanges upon said hoops, substantially as described.

4. The combination of a wooden cylinder having metal hoops at its ends, with a wooden door having hinges provided with flanges lapping upon said hoops to close the cracks between the door and the cylinder heads, and spring pressed bolts upon the door, said bolts having inclined surfaces upon their outer ends to firmly wedge said metal flanges upon said hoops, substantially as described.

In testimony whereof, I have hereunto set my hand this 11th day of February, A. D. 1904, at Chicago, Illinois, in the presence of two witnesses.

FREDERICK SNOW.

Witnesses:

C. G. HAWLEY,  
JOHN R. LEFEVRE