

No. 715,III.

Patented Dec. 2, 1902.

T. S. MILLER.
FRICTION DRUM.

(Application filed Mar. 25, 1901.)

(No Model.)

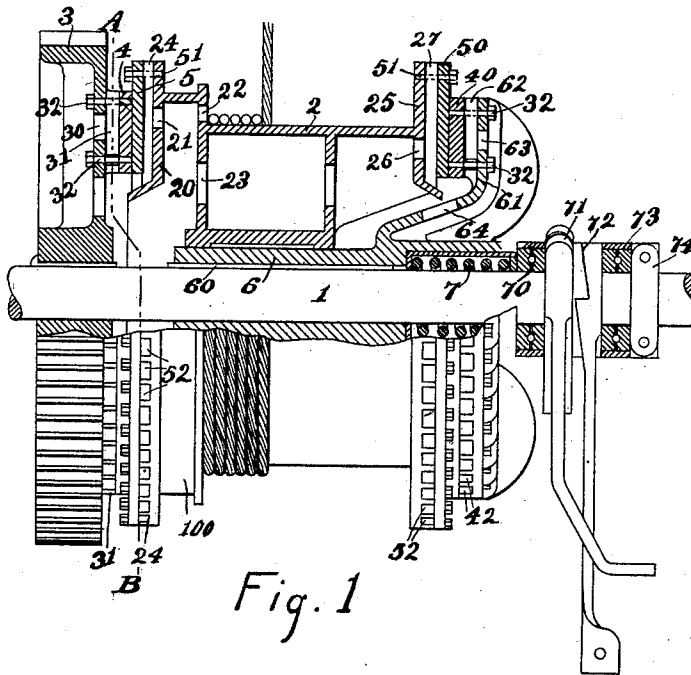


Fig. 1

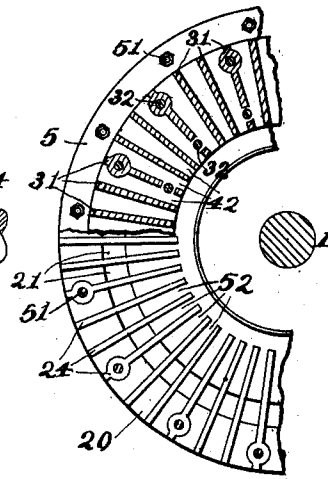


Fig. 2.

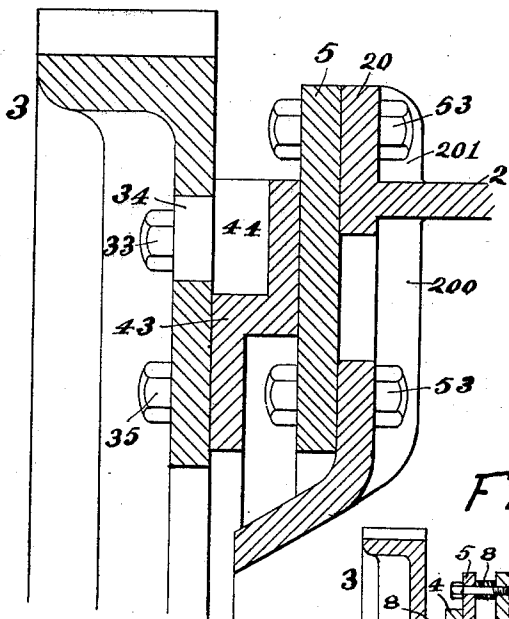


Fig. 3.

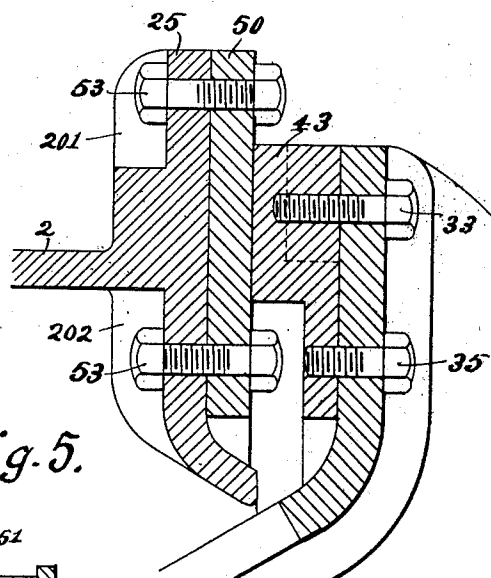


Fig. 4.

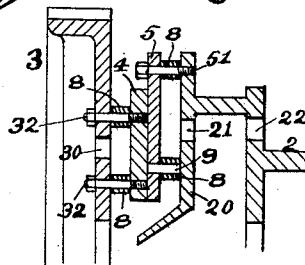


Fig. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS SPENCER MILLER, OF SOUTH ORANGE, NEW JERSEY.

FRICION-DRUM.

SPECIFICATION forming part of Letters Patent No. 715,111, dated December 2, 1902.

Application filed March 25, 1901. Serial No. 52,714. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SPENCER MILLER, of South Orange, in the county of Essex and State of New Jersey, have invented a new and Improved Friction-Drum, of which the following is a full, clear, and exact description.

My invention relates to an improvement applicable to friction-drums, and comprises the novel features hereinafter described, and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a partial sectional elevation of a friction-drum containing my invention. Fig. 2 is a cross-section of the drum, taken on the broken line A B. Figs. 3 and 4 are details showing, on a larger scale, sections through the friction members and a modified construction; and Fig. 5 is a similar section showing a further modification.

In the use of friction-driven drums where it is necessary or desirable to have a more or less constant slip between the friction-surfaces while the drum is in use the dissipation of the heat generated by the friction thus caused is often a serious matter. With such drums it is very desirable to provide means whereby the heat caused by the friction between the drum and its friction-plates may be rapidly dissipated. This result is secured in a high degree by the construction herein shown.

In the device as shown in the drawings the drum 2 is loosely mounted to turn about the shaft 1, the drum being, however, not mounted directly upon the shaft, but upon a sleeve 6, which is secured by a key 60 to turn with the shaft, but free to have a limited sliding movement along the shaft. This sleeve serves as the foundation or support for the friction or driving disk 61, which is designed to engage one end of the drum to turn it.

Fixedly secured to the shaft 1 is a gear-wheel 3, which serves as the other friction or driving disk, being adapted to be engaged by the other end of the drum 2. These friction or driving disks and the drum are preferably not brought into direct contact with each

other, but carry friction or wear plates which are directly engaged and which may be easily and cheaply replaced when worn out. One of these plates, 4, is secured to the gear 3 and another, 5, to the flange 20 of the drum at one end, while similar plates 40 and 50 are at the other end of the drum, secured, respectively, to the disk 61 and to the flange 25 of the drum. These plates are held off at such a distance from their supports as to leave an air-circulating space between each plate and its support, through which the air is forced by the centrifugal or fan action produced by the revolution of the drum and its friction driving-disks. As shown in Figs. 1 and 2, these plates are held off from their supports by means of bars or ribs 31, 24, 27, and 62, which may be formed either as a part of either the friction-disk or of the drum or may be simply inserted between the disks and drum and held in place by the strain of the securing-bolts. The bolts 32 hold friction or wear plates 4 and 40, respectively, to the gear 3 and disk 61, while bolts 51 hold the friction or wear plates 5 and 50 to the flanges of the drum.

In Fig. 5 the friction or wear plates are shown as separated from their supports by thimbles 8, which surround the securing-bolts. At 9 in this figure is shown a pin, which is secured to the plate 5 and has a thimble 8 about it to support the inner edge of the plate. These pins may be supported upon the drum instead of by the plate. In this construction the end surface of the drum is plain, which is a cheaper form to make than where radial ribs are cast thereon.

The radial channels 42 and 52, formed by the construction described between the friction or wear plates and their supports, open freely to the air at both ends, so that when the parts revolve the air is forced through these channels, as by a fan, and being in direct contact with the larger portion of one surface of the friction-plates absorbs quickly and carries away the heat caused by the friction. If desired, additional air-supply may be furnished through holes or ports 30, 21, 26, and 63, which extend through the flanges of the friction-disks and drum and communicate with the channels 42 or 52, intermediate

their ends. Holes 23 and 64, respectively, in the drum-heads and disk 61 admit air to the interior of the drum near the shaft.

The friction-drum is shown as provided with a peripheral surface 100, adapted to receive a brake. Holes 21 and 22 through the drum permit a cooling current of air to flow in contact with the inner surface of the brake-engaging section, so as to prevent undue heating thereof.

In Figs. 3 and 4 the friction-plates 5 and 50 are secured against plane surfaces of the drum-heads 20 and 25 and heat-radiating flanges 200, 201, and 202 are formed on the drum-heads. The friction-plates 43 43 are of a double angle or Z-shaped cross-section, but are provided with bosses 44, through which bolts 33 pass, thus forming pockets between the bolts and a larger radiating-surface. Holes 34 in the gear 3 also permit a cooling circulation of air.

The bore of the sleeve 6 is at one end increased in diameter to form a pocket about the shaft, in which is placed a helical spring 7, which is under more or less compression, its inner end bearing against a shoulder of the sleeve and the other against a ball-bearing or antifriction washer 70. Farther out upon the shaft is secured a thrust-collar 74, and next to this is another ball-bearing or antifriction washer 73. Between the two ball-bearing or antifriction washers are placed the cam members 71 and 72 or other equivalent devices, by which pressure is applied between the drum and its friction driving-disks. The strength of the spring 7 and the space between the washer 70 and the end of sleeve 6 should preferably for many purposes be such that the entire force of application of the friction devices would be communicated through the spring, thus causing a steady and yielding pressure between the friction-plates.

I am aware that the mechanism herein shown for accomplishing the result desired may be widely varied without essentially changing the character of the device, and therefore I do not wish to be limited to the forms of mechanisms herein shown, said mechanisms being given to indicate only the forms at present preferred by me for carrying out my invention.

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

1. In combination, a driving member, a driven member, a friction-shoe between them and means securing said shoe to one of said members leaving a cooling-passage between said shoe and said member.

2. In combination, a driving member, a driven member, two friction-shoes between them and means securing each of said shoes to one of said members leaving a cooling-passage between each shoe and the member to which it is secured.

3. In combination, a driving member and a driven member frictionally engaging each

other in an approximately radial plane; one of said members being provided with a cooling-channel approximately parallel with the plane of frictional engagement.

4. A friction-drum having a removable friction-plate and means for supporting said plate slightly removed from the body of the drum whereby a space is formed for the circulation of a cooling fluid between the friction-plate and the body of the drum.

5. In combination, a driving member and a driven member frictionally engaging each other in an approximately radial plane; each of said members being provided with a cooling-channel approximately parallel with the plane of frictional engagement.

6. In combination, a driving member and a driven member frictionally engaging each other; each of said members being provided with a cooling-channel, said channels extending approximately parallel with the friction-surface and respectively on opposite sides thereof.

7. A friction-drum having a separate wear-plate and radial channels in the backing next to said wear-plate and open at each end for a free circulation of a cooling fluid.

8. The combination with a friction-drum and a driving member therefor, of friction-plates adapted to be secured respectively to the drum and to the driving member, said drum and driving member having cooling-channels in their surfaces which receive the friction-plates.

9. In combination, a driving member and a driven member frictionally engaging each other; one of said members containing the parallel plates 5 and 20 between which occurs a cooling circulation for the friction-surface.

10. In combination, a driving member and a driven member frictionally engaging each other, one of said members containing the parallel plates 5 and 20 between which occurs a cooling circulation for the friction-surface; the space between said plates being provided with a peripheral opening, an opening toward the axis of rotation and a lateral opening.

11. In combination, a driving member and a driven member frictionally engaging each other, a friction-brake engaging one of said members and a cooling-passage extending between the brake friction-surface and the friction-surface between said driving and driven members.

12. A member containing a friction-surface by which it is driven and another friction-surface by which it is stopped and a cooling-passage interposed between said friction-surfaces.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS SPENCER MILLER.

Witnesses:

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CHAS. J. RATHJEN.