Francis A. Gardner.

CASTOR.

111193 PATENTED JAN 24 1871

Fig. 1.

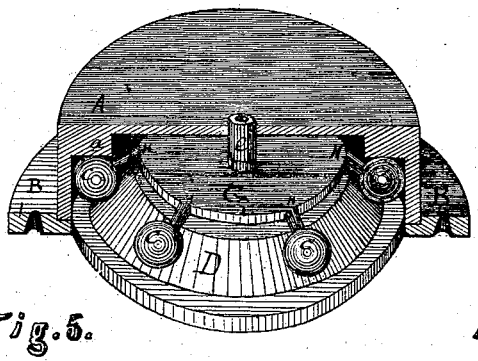


Fig. 5.

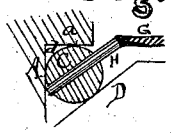


Fig. 4.

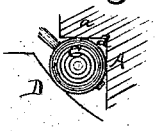


Fig. 2.

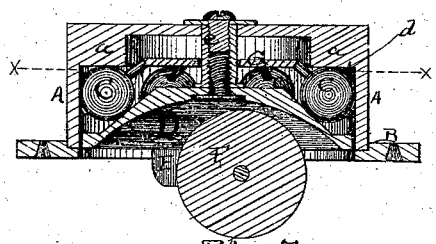
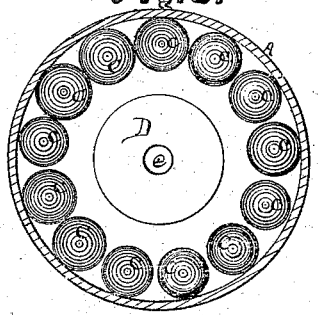


Fig. 3.



WITNESSES.

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FRANCIS A. GARDNER, OF DANBURY, CONNECTICUT.

Letters Patent No. 111,193, dated January 24, 1871.

IMPROVEMENT IN CASTERS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, FRANCIS A. GARDNER, of Danbury, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Casters; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, in which—

Figure 1 is a sectional perspective view of my caster.

Figure 2 is a transverse sectional elevation of the same

Figure 3 is a horizontal plan on line *x x*.

Figure 4 is a cross-section showing curved caster-plate.

Figure 5, section of friction-roller.

This invention relates to that class of casters which is used for furniture and other movable articles, and which is provided with friction-rollers to reduce the friction of the spindle in its socket, or to dispense with said spindle entirely, and to enable the bearing-roller to turn more readily in the required direction.

In casters where friction-rollers have been employed to relieve the friction upon the central spindle they have always been arranged so as to revolve upon axes perpendicular to the prime axis of the caster, and in consequence of this arrangement the centrifugal tendency of the rollers so placed causes material friction between said rollers and those parts of the device which retain said rollers in place.

My invention consists—

First, in forming the caster-plate with its upper surface inclined to the prime axis of the caster at an angle of forty-five degrees or thereabout, and inclosing the same in a flanged cylindrical case, with friction-rollers interposed between said inclined face on the one side and said shell and flange on the other, so that the axes of said rollers shall be inclined to the prime axis of the caster at an angle corresponding to the angle of the inclined face of the caster-plate.

Second, and the plate G, with radial arms oblique to the prime axis of the caster, at an angle of forty-five degrees or thereabout, said arms to retain the friction-rollers at equidistant points.

That others may fully understand my invention, I will particularly describe its construction and operation.

A is the shell which contains the operative parts of the apparatus. It is provided with some convenient means of attachment to a piece of furniture or other movable article. For this purpose a flange, B, may be employed, and said flange may be made separate, or, it may be, form a part of the shell A, and it may project laterally or in the form of a socket, as may be most convenient or best adapted to the purposes for which the caster is intended to be used. When made separate, as shown in the drawing, it may be made to retain the operative parts of the caster in place.

The interior of the shell A is cylindrical, and it is provided with a flange, *a*, projecting inward at right angles to the sides of the cylinder.

The spherical rollers C C rest in the angle formed by the cylinder A and flange *a*, and when in operation they press equally against said parts.

The caster-plate D is fitted loosely to the open end of the cylinder, and its upper side is beveled at an angle of about forty-five degees to the side A and flange *a*.

A circular space, *d*, with triangular section, will thus be formed for the reception of the spherical rollers C, and the said rollers will therefore be interposed between the shell A and the plate D, and will keep them apart. The rollers C may be placed loosely in this space, as shown in fig. 3, and in number as many as can be placed therein without crowding each other.

It will be perceived that, with this arrangement of the plate D within the shell, the rollers C are equally forced outward against the cylinder A and upward against the flange *a*, and that the resultant direction of force is forty-five degrees to the axis of plate D and perpendicular to its inclined upper surface.

The friction-rollers C C revolve upon axes which are inclined to the prime axis of the caster at an angle of forty-five degrees or thereabout, so that the load stress and the centrifugal thrust act against the same points on the surface of the caster-plate.

The reactive force is against the plate D, which is thereby retained in its central position, and frictional contact with the lower edge of the shell A is prevented.

A central steady-pin, *e*, will be useful sometimes to maintain the horizontality of the plate D, though this will hardly ever be disturbed except by violence.

If the angular face of the plate D be made concave, as shown in fig. 4, the displacement of said plate will be almost or entirely prevented.

The plate D, being supported upon the free-moving spherical rollers C C and without contact with the shell A, will revolve with the greatest possible freedom, the friction being thereby greatly reduced.

Upon the lower side of the plate D are two lugs, E E, one of which only is shown in fig. 2, to form bearings for the caster-wheel F. As before stated, the caster-wheel revolves with a very small amount of friction, and the axis of the wheel F can therefore be placed very near to the axis of the plate D. The load will then be distributed very nearly equally upon the several spherical friction-rollers.

When the spherical rollers C C are placed loosely

between the shell A and plate D they may be liable to crowd each other, and thus friction will be caused between them somewhat in proportion to the load sustained.

To reduce the number of rollers required, I employ a plate, G, with three or more radial arms, H, made oblique to the prime axis of the caster and coincident with the axes of revolution of the rollers C, and each of said arms pass through one of said rollers as an axle, the rollers being perforated for that purpose.

The plate G rests freely between the shell A and the caster-plate D, and serves only to retain the friction-rollers at equidistant points, and does not add in any appreciable degree to the friction of the moving parts.

I am aware that conical rollers with axes perpendicular to the prime axis of the caster have been used between inclined plates; but I am not aware that rollers revolving upon axes oblique to said prime axis have ever been so used.

The rollers C might be maintained at equidistant points by arms projected from plate G between them, but that would cause objectionable surface friction.

Having described my invention,

What I claim as new is—

1. The shell A, constructed with the flange *a*, in combination with a caster-plate, D, constructed with a face inclined at an angle of about forty-five degrees to the prime axis of the caster, and the spherical rollers C, to operate in the manner set forth.

2. The plate G, constructed with radial arms H oblique to the prime axis of the caster and about parallel with the inclined surface of the plate D, and combined with the shell A, plate D, and rollers C, for the purpose set forth.

FRANCIS A. GARDNER.

Witnesses:

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