2 Sheets—Sheet 1.

F. MILLWARD.
Roundabout.

No. 198,659. Patented Dec. 25, 1877.

Fig. 1

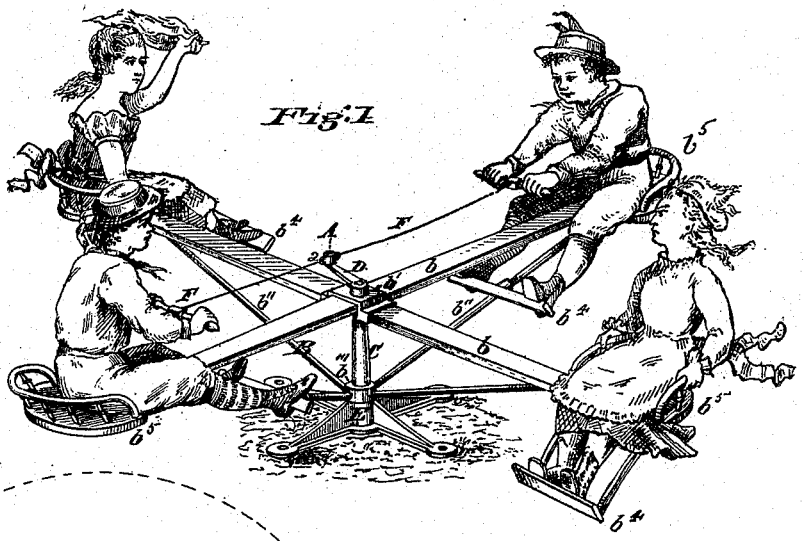


Fig. 2.

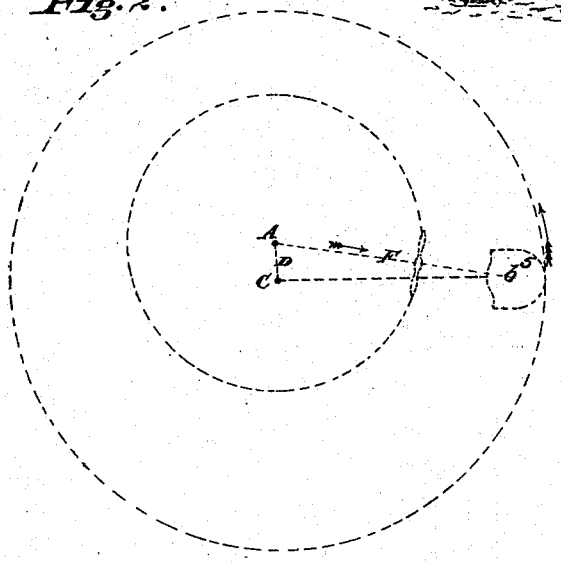


Fig. 4

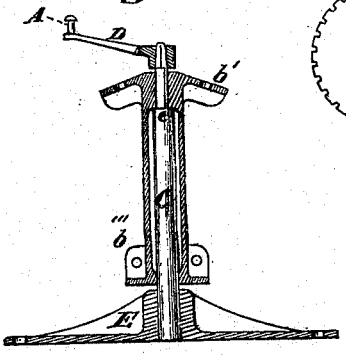


Fig. 5

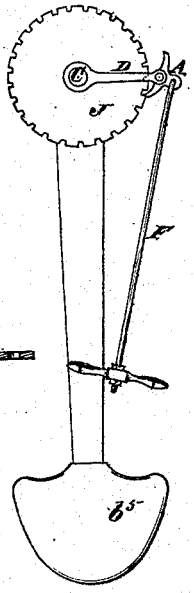


Fig. 3

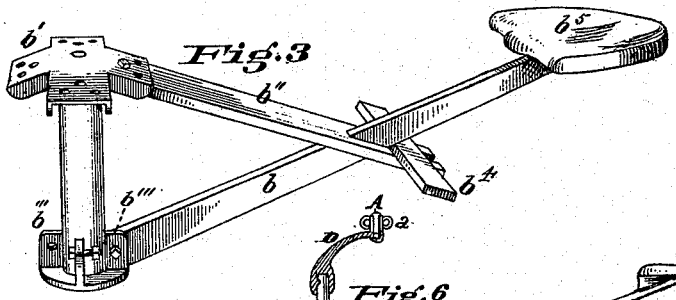
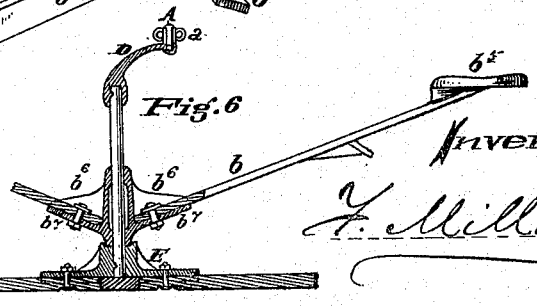


Fig. 6



Attest
Edgar J. Ross
John E. Jones.

Inventor
F. Millward

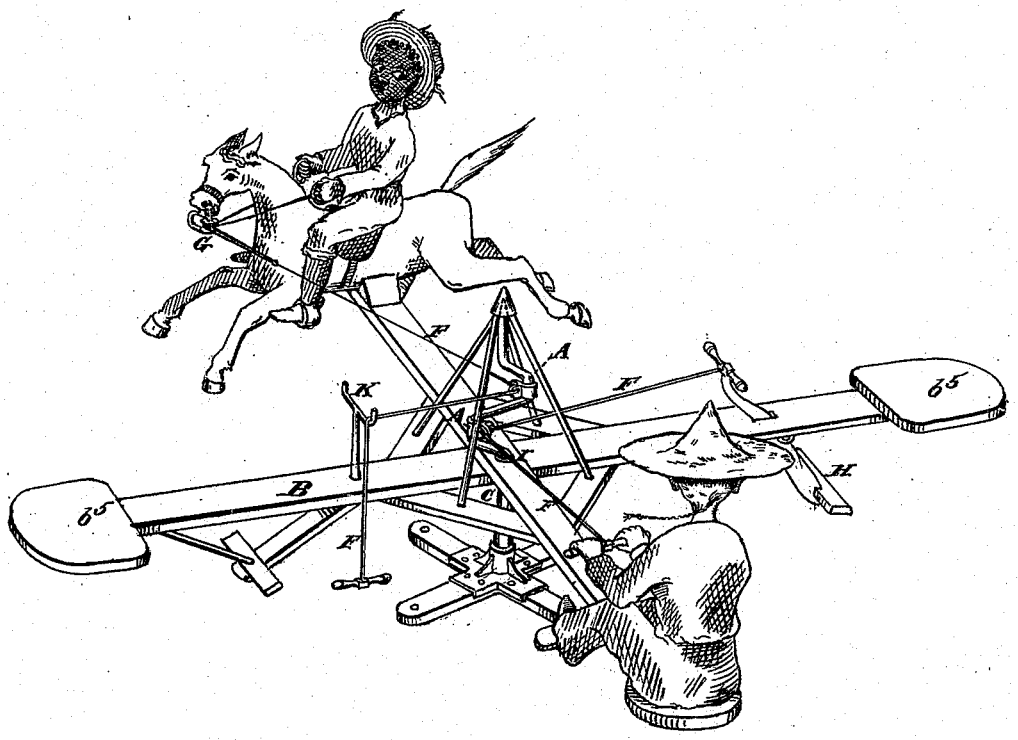
2 Sheets—Sheet 2.

F. MILLWARD.

Roundabout.

No. 198,659. **Patented Dec. 25, 1877.**

Fig. 7.



Attest

John E. Jones.

Edgar J. Moss

Inventor.

F. Millward

UNITED STATES PATENT OFFICE.

FRANK MILLWARD, OF CINCINNATI, OHIO.

IMPROVEMENT IN ROUNDABOUTS.

Specification forming part of Letters Patent No. **198,659,** dated December 25, 1877; application filed November 7, 1877.

To all whom it may concern:

Be it known that I, FRANK MILLWARD, of Cincinnati, Hamilton county, State of Ohio, have invented an Improvement in Flying-Dutchman or Roundabout, of which the following is a specification:

The object of my invention is the production of a lawn-toy having all the outdoor pleasure-giving characteristics of the ordinary "flying Dutchman" without its cumbersome unwieldy character and complicated costly machinery.

My object is, furthermore, to construct the toy so that the riders (one or more) can, from their seats, propel the wheel or frame on which they ride without the employment of gearing, pulleys, rotating shafting, or revolving cranks, for machines which involve the use of such devices for enabling the operator to generate rotary motion with a crank and transmit the same through a system of gearing or belted pulleys to the riding-wheel are entirely unsuited for use by children, and too costly for marketable manufacture.

My invention consists of a wheel or frame, on which the riders may sit or stand, and a stud continuously or intermittently fixed, on which stud the riders may pull or push, the act of pulling or pushing at the proper time on this stud (which is eccentric to or outside of the center of the wheel) causing the wheel to rotate.

In the accompanying drawings, Figure 1 is a perspective view of a lawn-toy embodying my invention. Fig. 2 is a diagram illustrating the mechanical philosophy of the invention. Figs. 3 and 4 are, respectively, a perspective view and section, showing one of the many ways of constructing the stand and wheel. Fig. 5 illustrates a modification in the method of operating the wheel, in which the stud or wrist on which the operators pull is only stationary during the act of pulling. Fig. 6 illustrates, in section, a very simple method of constructing the stand and wheel. Fig. 7 is a perspective view, illustrating several modifications, hereinafter explained.

The main feature of my invention is the stud or strain-point A, in combination with the wheel B, which revolves in a circle eccentric to it.

There are many ways of confining the wheel to its proper path and properly localizing the stud; but I prefer to journal the wheel on a stationary upright shaft, and to attach the stud to the same shaft by a laterally-extending arm.

C is the shaft, and D the arm which supports the stud.

The shaft may be an extension of a post firmly fixed in the ground; but in order to avoid the necessity of digging and ramming the earth around the post to secure it, I prefer to form upon or attach to the shaft a base-plate, E. This may be large enough for attachment to a floor by screws, or for attachment, by nails or screws, to stakes driven in the ground; but I prefer to make the base-plate as shown in Figs. 6 and 7, and secure to its under side wooden extensions, as shown, to make a cross large enough to support the wheel and riders against tilting without fastenings to the ground or floor. The wheel should have a long bearing on the shaft, and to get this two separate bearings may be used, as in Fig. 1, where the arms *b* of the wheel are secured to a bearing-plate, *b'*, journaled to the shaft, and resting on a shoulder on the shaft similar to shoulder *c*, (shown in Fig. 4,) and the braces *b''* are secured to the bearing *b'''*, which may or may not rest and run on the base-plate E; or one long bearing in one piece may be used, as in Figs. 3, 4, and 6.

In Fig. 3 the wooden arms *b* of the wheel are edge up and secured to the flanges *b'''*, which project from the lower end of the bearing, while the wooden braces *b''* are secured to the plate *b'* at the upper end, and straddle the arms *b*, as shown, the foot-rest b^4, when properly secured, serving to tie the frame-work together.

In Fig. 6 the arms *b* of the wheel are wooden pieces lying flat, entering at the lower ends between the flanges b^6, and resting on the flange b^7, to which they are secured by bolts.

The seats b^5 may be common stool-tops, as shown on the arms in Figs. 3, 5, and 6, and on three of the arms in Fig. 7; or they may be horses, as shown on one arm in Fig. 7, or arm-chairs, as shown on all of the arms in Fig. 1; or they may be carriages.

The arm D is attached in Figs. 1 and 4 by

making it with a square hole, tapering slightly, and fitting snugly over the square end of the shaft.

In Fig. 6 the arm is cast on the shaft, and so is the base-plate, the bearing of the wheel being slipped over the shaft before the arm is cast on.

On the stud A, I place a swivel-eye, *a*, to which the cords or rods F (which are held and strained by the operators) are attached.

As many straining rods or cords may proceed from this eye as there are seats for riders, or any number less may be used.

It is the simplest way and the best to have the operators face inward and directly strain these cords or rods by tension to create the motion of the wheel; but it is obvious that the riders may face in the direction of motion, the cords being carried around a corner, either by a spool, G, as in Fig. 7, or by the use of a bell-crank, and in place of depending upon the hands to strain the rods or cords, a foot-lever, H, Fig. 7, may be used, assisted or otherwise by the hands.

In place of the wheel resting and running on a collar, it may rest and run on a point, as in Fig. 7. In this case the guide-bearing I is desirable, but not essential, as, when the wheel is properly loaded and properly operated, it may have no bearing; but the point on which it rests and this construction enables the operators to give it the "teeter-tawter" motion while rotating.

A single arm and stud, D A, I have found, is all that is necessary or desirable, and a single cord or rope is sufficient in the hands of a boy six years old to rotate the wheel, even with riders on all the seats. Two ropes are better, however, as the work is divided. These two ropes may extend to opposite seats, or seats at right angles.

Two arms and studs may be used, as in Fig. 7, so that two opposite riders may strain at the same time, and lean inward at the same time, and the other two operate in the same way at right angles, and the strain is thereby equalized and the balance of the wheel preserved.

The method of construction shown in Fig. 6, however, is so simple, and withal so satisfactory in every way, that additions to it would be costly and unnecessary incumbrances.

The arm which carries the stud A may, as is shown in Figs. 1, 4, 6, and 7, be in one piece and permanently stationary, or the stud A may be carried by a swinging arm, D, Fig. 5, the arm carrying a single or double pawl meshing in a ratchet-wheel, J. The rod F in this figure is attached for convenience to the pawl, and when the operator pulls it the arm and its stud are stationary, and the riding-wheel rotates. This action is precisely the same as by the construction shown in the other figures.

The construction shown in Fig. 5 enables the operator to vary the length of the pulling-stroke, and to move the stud-arm back to re-engage it with the wheel J for a new pull whenever he pleases. He may swing the rod to the other side and use the other pawl when a reverse motion is desired.

Operation: By reference to Fig. 2 the philosophy of the operation will be readily understood. The riding-wheel B is adapted to rotate upon or about an axis or center of motion, C. The rider is seated at b^5, and pulls upon the handle of rope or rod F, which is connected to and swivels upon the stud A. This rod or rope swings entirely around the stud A, and the circle described by its handle is eccentric to the circle described by the seat. Consequently, if the machine was rotated by some extraneous power, the handle would move to and from the rider. The converse is therefore true, that, if the rider applies a pulling force to the handle at a time when a movement of the wheel would lessen the distance between the seat and the stud, such application of force will result in giving motion to the wheel. This pulling action he can exert with that result for nearly half a circle, and the opposite rider may propel throughout the greatest portion of the other half. The momentum of the wheel, however, is sufficient, after power has been applied, for even a quarter of a turn, to keep the motion up for the remainder of the circle. Two operating-riders on opposite seats gives a steadiness of motion, which one operating-rider cannot effect, unless he both pulls and pushes on the member F, which must then be a rod.

The member F may be a pushing-rod, as before stated, and, if this is preferred, the push can be effected best by the feet, either direct or through a lever, the hands then being at liberty to steady the body by holding a bracing-handle. When the member F is a tension rope or rod the foot-rest b^4 enables the rider to brace himself for the pull.

As another modification in the straining-connection to the stud A, the members F may be the spokes of a wheel, as many as desired, secured to a hub, swiveling on stud A, the rim of the wheel, which may be round in cross-section, being adapted to act as handles for the riders to grasp. The rider then pulls on the rim of the wheel as he would on the handle of a rope, and the effect is just the same.

To prevent straining-ropes from getting entangled, they may rest, when not accidentally dropped, or not in use, each upon the support K, over which it may be pulled to and fro as the wheel revolves, the weight of the handle keeping it taut.

I have described many modifications in the construction of my wheel, and many others will suggest themselves to any skilled mechanic without departing from the principle of construction and mode of operation of my invention.

I claim—

1. The combination of a rotary frame or wheel for supporting a rider or riders, a stud or strain-resistant eccentric to the axis of the

frame, and one or more strain-transmitters, loosely connected to said stud or strain-resistant, and adapted to receive the muscular force of the rider or riders to rotate the frame, substantially as specified.

2. A wheel or frame for carrying riders, in combination with a supporting stand or base, having a vertical shaft, on which the wheel is journaled, and a laterally-extending arm carrying a stud or strain-resistant, to which one or more straining rods, ropes, or other strain-transmitters, acted upon by the riders, are coupled.

In testimony of which invention I hereunto set my hand.

FRANK MILLWARD.

Witnesses:
JOHN E. JONES,
J. L. WARTMANN.