

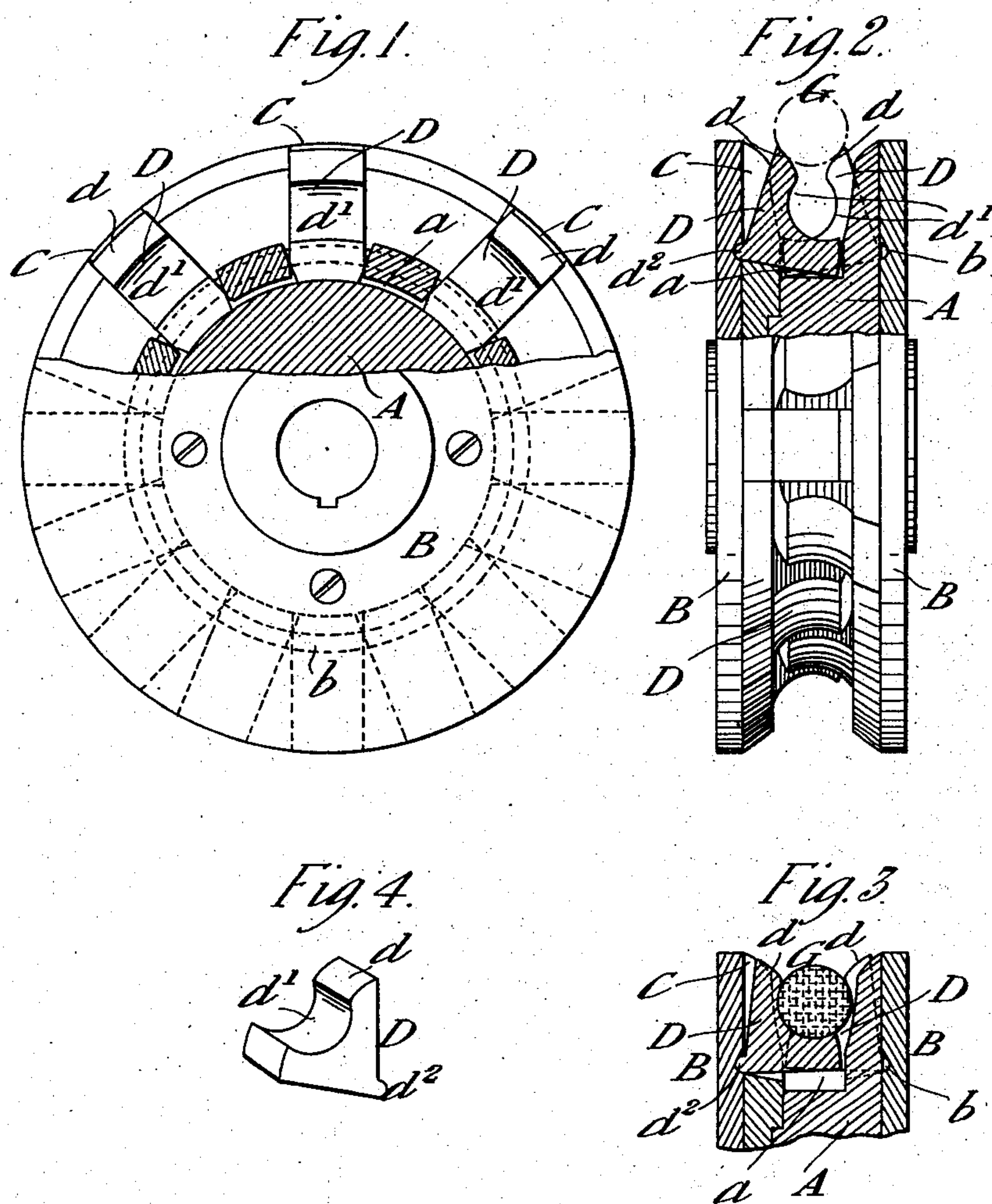
No. 741,614.

PATENTED OCT. 20, 1903.

S. R. BATSON.  
GRIP PULLEY.

APPLICATION FILED SEPT. 22, 1902.

NO MODEL.



Witnesses:  
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## UNITED STATES PATENT OFFICE.

SAMUEL R. BATSON, OF PENGE, ENGLAND.

## GRIP-PULLEY.

SPECIFICATION forming part of Letters Patent No. 741,614, dated October 20, 1903.

Application filed September 22, 1902. Serial No. 124,446. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL ROBERT BATSON, a citizen of England, residing at No. 76 Wordsworth road, Penge, in the county of Surrey, England, have invented a certain new and useful Improved Grip-Pulley, (for which I have made application for a patent in Great Britain, No. 4,854, dated February 26, 1902,) of which the following is a specification.

My invention relates to an improved construction of that kind of pulley for transmitting and receiving power by ropes, cords, or belts in which a grip is exerted automatically upon the rope, cord, or belt by means of movable jaws as it passes onto the pulley, so as to effectually prevent it from slipping. In such pulleys as heretofore proposed the said jaws have always been held in the open position for receiving the rope by means of spring or wedge action, the pressure of the rope upon the bottom of the said jaws being made to press them inward, so as to grip the rope, while compressing or putting tension upon the spring action.

My present invention has for its object a simplified construction of such grip-pulleys whereby the use of springs or spring or wedge action is entirely dispensed with, and thus the liability of the pulleys getting out of order by the spring or wedge action becoming defective is avoided.

The essential features of the invention consist in constructing the gripping-jaws with inclines on their outer ends so formed that when the rope in passing onto the pulley comes in contact with the said inclines it first forces these, and consequently the outer ends of the jaws, apart until it can enter between concave surfaces of the jaws, whereupon in pressing against the inner or bottom parts of these it causes them to turn on their fulcra, so as to grip the rope between them. The fulcra of the jaws are constituted by rounded fillets formed on the outer sides thereof, which fit into corresponding grooves formed in separate side cheeks or disks of the pulley, as will be presently described.

Figure 1 of the accompanying drawings shows a side view, partly in section, of a grip-pulley constructed according to my invention. Fig. 2 shows an end view, partly in section, showing the rope just about to enter between

the gripping-jaws. Fig. 3 shows a part section, showing the rope between the gripping-jaws. Fig. 4 shows one of the gripping-jaws detached.

The pulley consists of a central circular plate A, (which is preferably made in two parts, as shown, for facilitating manufacture,) and two separate circular plates B, forming the side cheeks, suitably fixed to A by screws or other fastenings, are of substantially the same diameter as the central plate A. The circular plate A, has first, a peripheral groove  $a$ , and, secondly, in the side walls of this groove are formed rectangular recesses C C, into which fit the gripping-jaws D, the outer surfaces of which are of the angular form shown at Fig. 4, while the inner surfaces are formed, first, with an incline  $d$ , and, secondly, with a concave surface  $d'$ , adapted to fit the sides of the rope or cord G. At the angle of the outer surfaces is formed a projecting rounded fillet  $d^2$ , which when the jaws are fitted in their notches C and the side cheeks B are fixed on engages with a corresponding groove  $b$ , formed in the inner surfaces of the cheek, and thus constitutes the fulcrum on which the jaw D turns and also serves to secure the jaw in position on the pulley.

Assuming that the rope G is passing over the top of the pulley from right to left, it is obvious that as the wheel rotates approximately only those jaws at the right, top, and left of the pulley—that is to say, about two-thirds of their total number—will be engaged in gripping the rope, and as any pair of the jaws comes to that point on the left side of the pulley where the rope no longer bears upon the pulley the rope will exercise an outward pressure upon the concaved surfaces  $d'$  of that pair of jaws, causing them to open and release the rope. The preponderance of weight will then draw the inner ends of the gripping-jaws D outwardly as the pulley rotates and the outer ends toward the cheeks B, thereby turning the jaws upon their fillets  $d^2$  and causing them to open wide. These jaws remain open until they have passed to that point where the rope can exercise pressure upon the pulley. At this point the rope will either freely enter past the outer inclined surfaces  $d$  if the jaws have remained open, or if they have shown a



tendency to close, as shown in Fig. 2, the rope G will bear upon their outer inclined surfaces  $d$  and will first force these parts of the two jaws apart until the space between them is sufficient to allow the rope to enter between the concaved surfaces  $d'$ , as shown at Fig. 3. As by the above-described motion of the jaws the inner or lower ends thereof will have been raised up from the bottom of the groove  $a$ , it will be seen that when the rope while in the position shown at Fig. 3 exerts an inward or downward pressure upon such ends it will cause the concave surfaces  $d$  to exercise a gripping action upon the rope the force of which will be proportionate to the tractional force exerted on the leading side of the rope or cord, such grip being in all cases sufficient to effectually prevent any slipping of the rope or cord on the pulley. As soon as by the rotation of the pulley the inward pressure of the rope upon a particular jaw is relieved as the rope moves away therefrom the jaw will turn backward, so as to leave the rope free to pass away.

Having thus particularly described the nature of my said invention and the best means I know of carrying the same into practical effect, I claim—

A pulley comprising a central circular plate, a circular plate secured to each side of

said central plate, said central plate provided with a peripheral groove having the walls thereof alternately cut away to form recesses, each of said side plates having its inner face provided with an annular groove semicylindrical in cross-section, said grooves adapted to have the lower portions of their walls register with the outer edge of the bottom of the said recesses, said side plates of such diameter that when set up they are adapted to form one wall of said recesses, and a gripping-jaw mounted in each of said recesses, said gripping-jaws substantially in the form of bell-crank levers and provided at their angles with semicylindrical fillets adapted to engage in said grooves thus constituting a fulcrum for said jaws, and said jaws when in their inoperative position at the top further adapted to have their inner ends engage the bottom wall of said peripheral groove and when in their operative position to be free of the bottom wall of said peripheral groove, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

S. R. BATSON.

Witnesses:

JOSEPH MILLARD,  
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