

(No Model.)

2 Sheets—Sheet 1.

A. E. BROWN.
GRIP PULLEY.

No. 524,478.

Patented Aug. 14, 1894.

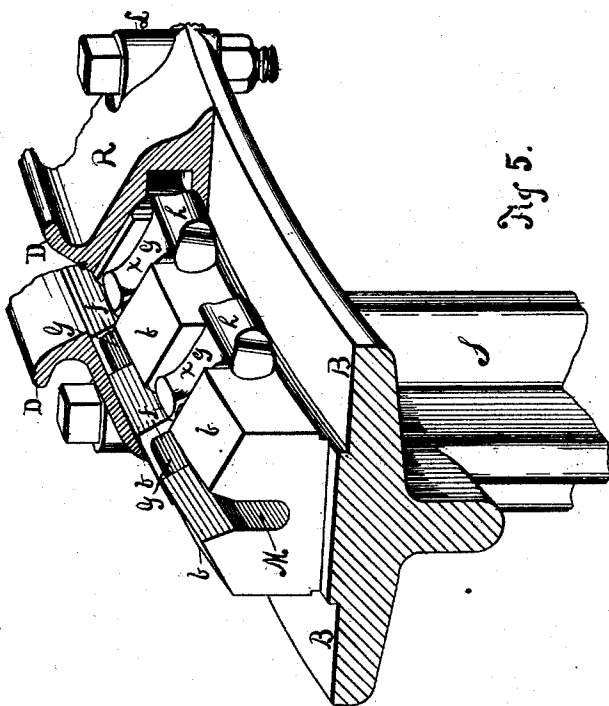


Fig. 5.



Fig. 3.

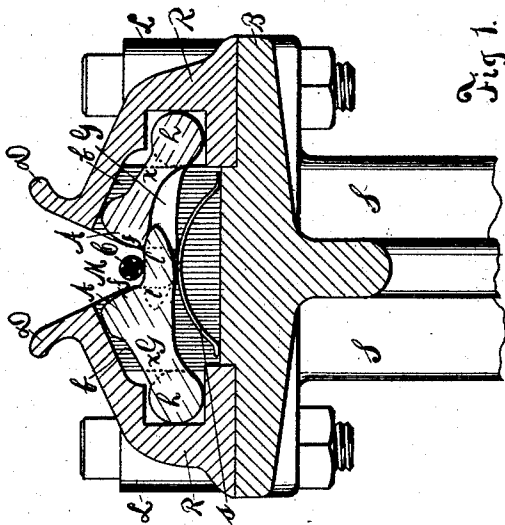


Fig. 1.

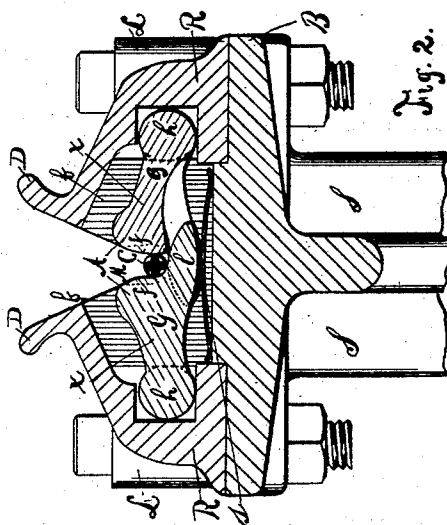


Fig. 2.

WITNESSES.

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by George C. Wing,
his ATTORNEY.

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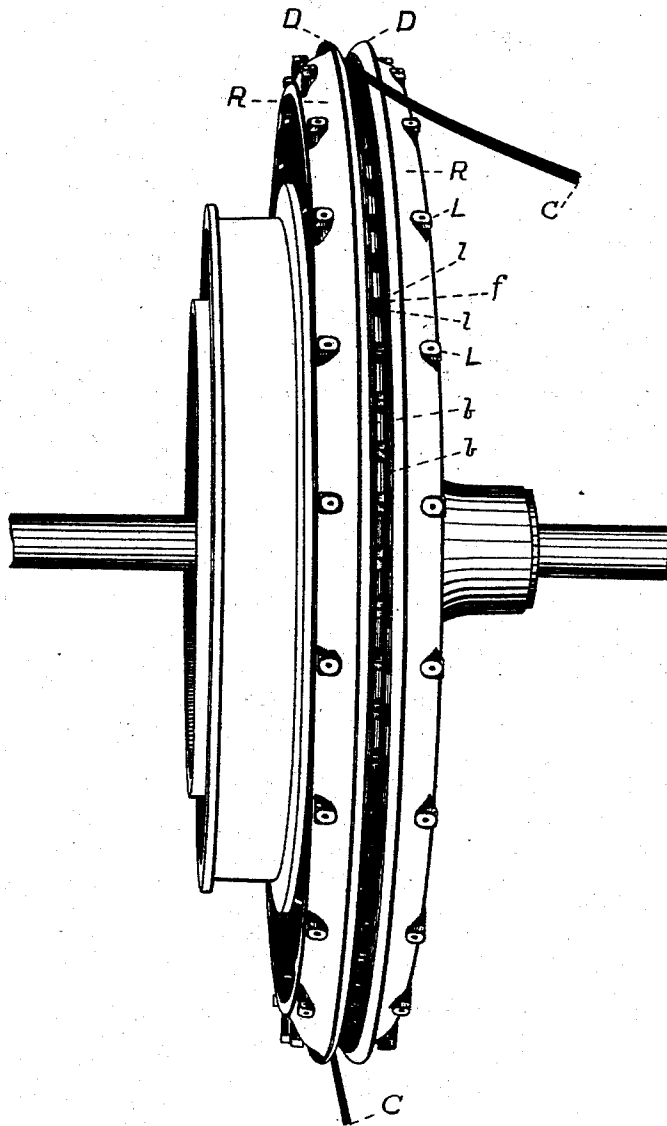


Fig 4.

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UNITED STATES PATENT OFFICE.

ALEXANDER E. BROWN, OF CLEVELAND, OHIO.

GRIP-PULLEY.

SPECIFICATION forming part of Letters Patent No. 524,478, dated August 14, 1894.

Application filed January 14, 1893. Serial No. 458,390. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER E. BROWN, a citizen of the United States, residing in the city of Cleveland and county of Cuyahoga, in the State of Ohio, United States of America, have invented a new and useful Improvement in Grip-Pulleys; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of pulleys, or wheels, whose rims are provided with an annular central groove or score to receive the rope, or cable, and a series of gripping jaws, arranged in pairs upon or within the opposite sides of the said groove, or score, to grip the said cable when it is brought between the same.

Figure 1 represents a cross-vertical section through the rim of the sheave, or pulley when the pair of gripping jaws exposed thereby is idle. Fig. 2 is a like sectional view disclosing the relative posture of the pair therein, when the cable C, (shown in similar section) is gripped. Fig. 3 is a perspective view of a right and left grip-jaw, or dog, respectively, such as together constitutes a suitable pair for use in the pulley. Fig. 4 shows, respectively, a sheave equipped with a form of grip-jaws, or dogs—and in a manner covered by my invention, and Fig. 5 is a segmental view in perspective of the rim of a grip-pulley, provided as in Fig. 4, and having a portion of the annular shells R removed.

Designating now more particularly the various specific parts and features comprised in the said drawings, and their operative relations to the device, G, in each instance, points out the grip-jaw, or dog, as a whole. The said pieces G, include the grip-heads A, (having exterior faces noted by the letters *f*,) and the heels *h*, which, in this case are integrally connected with the heads A, by the intervening bodies, or shanks X. X. The said shanks extend at a slight angle below and to the front of the said heads A—into and forming the teeth, or lever-projections *l*, *l*, which latter are located at one side of the faces *f*, *f*, to which they pertain, and reciprocally, as respects each other, in each pair.

In the device shown the heel *h* is in the nature of a cross-pin, or hub, extending transversely beyond the sides of the shank X, and

having the outer surface somewhat curvilinear, and shortened by the inward slant of its ends. (See Figs. 3 and 5.) In the same form of device M is a groove, or score, extending centrally around the rim, or felly, of the wheel, and of dimensions suitably proportioned, in each construction, according to the size of cable to be employed. The limiting surfaces, or sides, of the said score may be given an outward turn or flare, if desired, along their upper portions in order to guide the cable as it enters the score. This function, however, is chiefly performed, in the grip-pulley of the drawings herewith, by the supplemental guide pieces, D, D, which are superimposed by, and as a part of, the annular shells R.

The general superficial characteristics of the portion of the rim containing the score M, are important in the particular construction last above referred to. The uppermost portion of the rim immediately contiguous to the mouth of the score, slopes downwardly therefrom on each side at a uniform angle until—at a given distance from said score the surface of the said portion of the rim tends abruptly in a direction radial to the center of the wheel, and, to a distance that should slightly exceed the diameter of the hubs, or heels, *h*, *h*, which are to be used in the connection. Thereafter the remaining exterior or circumferential—portions of the rim—extend outwardly, in a flange like manner, on either side of the central portion thereof last described so as to form the annular bearing surfaces B. (Fig. 5.)

At intervals corresponding with the spaces desired between successive pairs of gripping jaws when in operative position about the pulley or wheel, the score M, and the central elevated portion of the rim heretofore described containing the same, are bisected or penetrated transversely by channels, or passages adapted to receive a pair of grip-jaws—(except the heels or hubs *h*, thereof) and to permit the same to be vertically oscillated therein. Upon referring to Fig. 5 it will be apparent that, by reason of the said channels or passages, the central portion of the pulley's rim is separated into and consists of a series of elevations, or blocklike projections, *b*, *b*, on opposite sides of the score, having the

same dimensions and similar intervening spaces. It is desirable that the said channels, or passages, should, at the same time, likewise divide the trough of the score M into
 5 a corresponding number of segments to a depth that will permit the interlocking lever-projections *l*, of each pair, to sink—if needs be—during the process of gripping—to any distance required beneath the lowest point of
 10 said score. The vertical depth of said channels, or passages, within said central portion of the rim, is, of course, limited by the depth, or thickness, of the said elevations, or block-like projections *b*, *b*, which bound the same.
 15 It should, however, be sufficient, in each case, to enable the grip-dogs G to rock therein, in their regular positions, without protruding above the tops of the said projections *b*, *b*.

R, R is an annular shell, or ring, adapted
 20 to be bolted through the lugs L, L,—or to be otherwise affixed, to the rim portions B, B, of the wheel. The interior configuration of the shells R, is such, that, when the grip-dogs G are duly located in their places within the
 25 several channels described, with their hubs in bearing against the outer ends of the said blocklike projections *b*—the said annular shells R will then rest upon the said rim portions B, B, to which they are secured, and
 30 also, upon the several blocklike projections *b*, *b*, and, extend across and thereby close from above the intervening passages which respectively contain the grip-dogs G. In the position last above described the shells R
 35 will necessarily lock the several hubs *h*, securely to their aforesaid bearings, and, constitute a firm abutment against any backward thrust of the same in the operation of gripping.

40 The particular form of my invention illustrated by the drawings requires that the uppermost edge of the shell R shall be flared outwardly from the score M—as denoted at D—and to thereby afford at each side of the
 45 score a fixed and continuous guide-surface which will successively lead the cable to the same relative gripping point in the trough of the score. It is obvious, however, that the feature D, just described, is not essential to
 50 my invention in its broadest form—or otherwise than as is hereinafter specifically claimed.

The device may be made and usefully operated without other guide-surface than is
 55 afforded by the score proper M, and without the extension thereof provided by the up-turned edges and surfaces D.

Beneath the interlocking teeth, or lever-projections *l*, *l*, in each pair of grip-dogs located within the said channels or passages
 60 intermediate between the block-like projections *b*, *b*,—I provide a spring S, with the office of throwing the heads A, A, within the said channels when pressure across the parts
 65 *l*, *l*, is relaxed, and, of maintaining the said heads within said channels, and the said interlocked lever-projections *l*, *l*, above the path

or trough of the score M—when the pressure for the time being is wholly removed.

I do not intend to limit my invention to the
 70 precise manner of securing the said office which I have herein shown and described. Any automatic arrangement—whether by means of springs of any sort or otherwise, that accomplishes the purpose indicated will
 75 equally come within the invention I claim.

The several parts of my device having been constructed in substantial conformity with the above description their relative adjustment into the working combination is simple.
 80 This consists, mainly, in mounting the grip-dogs G in pairs within the said channels—or passages between the block-like portions of the rim *b*, *b*, and thereafter superimposing the annular shells R and affixing the same respectively to the parts B. The grip-dogs G
 85 will thus be capable of turning about their hubs from a fixed point—and—by the tension of the spring S—without regard to the position of the wheel itself at any time, they will
 90 be held behind the faces of the guides D—without possibility of contact with the cable until the latter has passed down the said guides into direct bearing across the interlocking lever-projections *l*, *l*. Thereupon—
 95 by virtue alone of the lever action of the said projections *l*—under the powerful percussive impulse of the cable, the opposing faces *f*, *f*, of the heads A A, in a given pair of dogs, are
 100 successively advanced against the cable and instantly attached thereto. The releasing action of the grip is equally as positive. Inasmuch as the grip is made by the pressure of the cable upon the lever-projections *l*, *l*, when
 105 the latter are brought, by the revolution of the wheel, or pulley, at a tangential point with respect to the cable, it follows, that when such point is passed, the spring S, will cause the jaws of the dogs G to withdraw from contact with the cable and the latter without
 110 friction and at once—will become disengaged therefrom.

I am aware that grip-pulleys have been constructed wherein the grip-jaws are kept to
 115 their position by the aid of springs upon which the said jaws rest—and which, in other details resemble my present device. My said invention, however, is the first—so far as I am aware—in which the several pairs of grip-dogs
 120 are arranged within—or behind—a continuous and stable guiding surface to the score—and in such manner that they are in no degree exposed to contact with the cable until the exact moment for gripping has arrived; in which,
 125 moreover, by reason of the uniform design of the various constituent parts and features—and the principle of their adjustment—these may all be evenly turned up in the manufacture, and readily and speedily assembled.

What I claim as new, and desire to secure
 130 by Letters Patent, is—

1. A grip-pulley or sheave having a series of block-like projections on its rim parallel with and oppositely located in respect to a

similar series thereon, grip-dogs between said projections having hubs in operative bearing respectively against the outer bases of said projections, annular shells or rings upon said rim which severally abut against said hubs and extend above said projections and across the spaces in each of said series between the same, levers or teeth projecting from the front of said grip-dogs into the circumferential space between the said series, and suitable means for automatically oscillating the said grip-dogs until their said fronts are wholly between their said projections respectively whenever said teeth are not subjected to downward pressure by the cable to be gripped, all substantially as shown and described.

2. A grip-pulley or sheave having a series of block-like projections on its rim parallel with and oppositely located in respect to a similar series thereon, grip-dogs in the spaces between said projections in the series having hubs in operative bearing respectively against the exterior of said projections, annular shells or rings upon said rim behind and above said spaces and projections, and diverging outwardly at either side of the circumferential space between the two said series, levers or teeth, projecting from said grip-dog into said circumferential space, and suitable means for automatically oscillating said grip dogs to within said spaces, between said projections, whenever said levers, or teeth, are not subject to resistance from above, substantially as shown and described.

3. A grip-pulley having a series of block-like projections upon each side of the rim; grip-dogs pivotally connected in the spaces between said projections in such manner as

to project into the score whenever oscillated about their said connections in one direction and to retreat wholly within said spaces when oscillated in the opposite direction, a shell or ring affixed on said sides respectively outside of said block-like projections and spaces, which extends outwardly therefrom and constitutes an annular guide or score, together with levers that project from said grip-dogs into said score, and, suitable means for automatically oscillating and maintaining said grip-dogs wholly within said spaces, when said levers are free from engagement with the cable, substantially as shown and described.

4. A grip-pulley having a series of block-like projections upon each side of the rim; grip-dogs pivotally connected in the spaces between said projections in such manner as to project into the score when oscillated about their said connections in one direction, and, to retreat wholly within said spaces when oscillated in the opposite direction; a shell, or ring, affixed on said sides respectively outside of said block-like projections and spaces, which extends outwardly therefrom and constitutes an annular guide or score, together with levers that project from said grip-dogs and overlap each other in said score, and suitable means for automatically oscillating and maintaining said grip-dogs wholly within said spaces, when said levers are free from engagement with the cable, substantially as shown and described.

ALEX. E. BROWN.

Witnesses:

E. T. SCOVILL,
M. MILLARD.