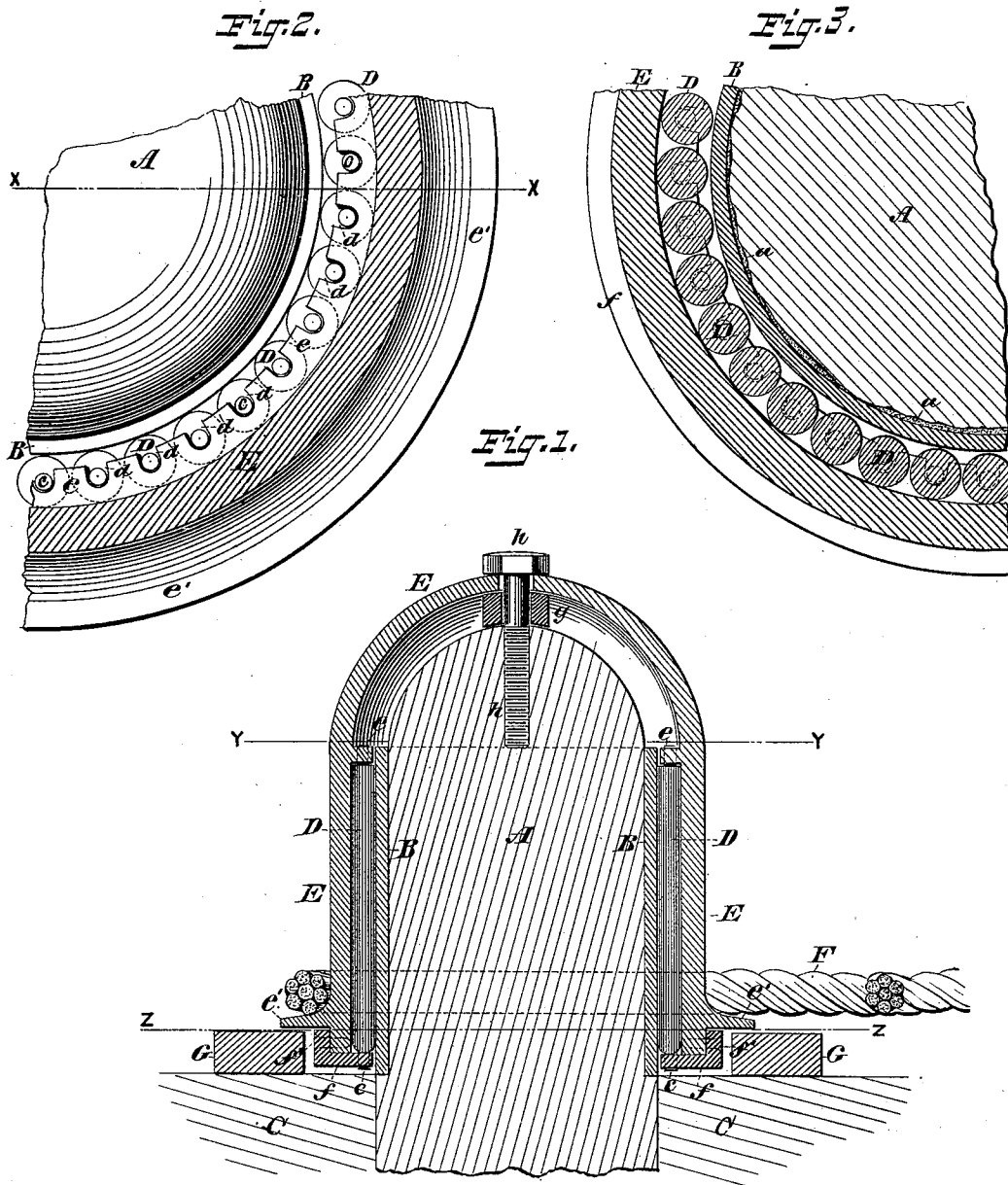


(No Model.)

F. G. JOHNSON.
ROTATING HAWSER SPILE.

No. 391,152.

Patented Oct. 16, 1888.



WITNESSES:

Gustave Dieterich
C. A. Dieterich.

INVENTOR.

Frank G. Johnson.

UNITED STATES PATENT OFFICE.

FRANK G. JOHNSON, OF NEW YORK, N. Y.

ROTATING HAWSER-SPILE.

SPECIFICATION forming part of Letters Patent No. 391,152, dated October 16, 1888.

Application filed May 2, 1888. Serial No. 272,602. (No model.)

To all whom it may concern:

Be it known that I, FRANK G. JOHNSON, a citizen of the United States, residing in the city, county, and State of New York, have invented new and useful Improvements in Rotating Hawser-Spiles, of which the following is a specification.

My invention relates to that class of spiles which are set in docks and to which vessels are secured by means of heavy ropes, chains, and wire cables. In many cases such spiles are daily employed for holding the main hawser of large steamboats and ships while the same are being backed around from the head of docks into their dock-slips, in which cases especially the hawsers and cables and spiles are submitted to an immense strain, and while under this tension they (the hawsers and cables) must slip around on the spiles as the boats and vessels are swung around into their slips, and when, too, oftener than otherwise, the ropes, and so the spiles, are wet. Under these conditions both the ropes and spiles are rapidly destroyed by cutting-friction. If the spiles be made of iron (as sometimes they are) and the hawsers consist of wire cables then the wires of the cables are cut by the spiles, and if the spiles are made of wood the wire cables cut the spiles, and if the spiles be of wood and the hawser of ordinary rope, then the spiles and hawser cut each other. Besides, when the hawsers are of large size, and the spile and vessel correspondingly large, and the hawser is paid out at great length, the hawser will not slip on the spile only at intervals and by jerks, which causes an unequal and extra strain, and thus renders the hawser liable to break, causing danger to life and damage to boats.

The object of my invention is to provide a rotating spile whereby there will be no slipping of the hawser on the spile, and whereby the wear to both the hawser and spiles is wholly obviated.

The nature of my invention consists in surrounding stationary hawser-spiles with a rotating cylinder, between which, to facilitate the rotation, there is provided a series of anti-friction rollers, whereby the rotating cylinder, upon which is placed the hawser, rotates by the action of the hawser, so as to prevent all motion and friction between the hawser and

the rotating cylinder, the rotating cylinder to be of such length as to cover that portion of the stationary spile which stands above the dock, and which said cylinder is preferably closed and rounded at the top to keep out rain, snow, and whatever might interfere with the working of the device, and to facilitate the passing of the loop of the hawser over it and removing the same, as shown in the drawings herewith. This rotating cylinder, with its anti-friction rollers, can be applied to stationary iron spiles as they may be found in use, and to wooden spiles by properly rounding the same; yet the nature of my invention further consists in a novel manner of fitting or preparing stationary spiles to receive the said rotating cylinder with its anti-friction rollers.

As the stationary spiles which are already set and in use vary in size and are more or less out of round, and many of them being too small to admit of being turned off or cut into circular form to admit of the application of the above-described rotating device, and some of which, also, being more or less cut off by the hawser, I have provided the means of utilizing such spiles and adapting them to the application of the above-described rotating apparatus, and by the same means rendering spiles (within certain limits) of various sizes uniform in size to avoid the necessity of too great a variety of sizes of the rotating apparatus, and by the same means to furnish a more uniform and harder surface to the stationary spiles than is possible to do by placing the friction-rollers in direct contact with the stationary wooden spile, as will fully appear in the following description and the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section on the line *xx* of Fig. 2; Fig. 2, a partial transverse section on the line *yy* of Fig. 1, and Fig. 3 a partial transverse section on the line *zz* of Fig. 1.

Similar letters refer to similar parts throughout the several views.

A is a stationary spile as set in the docks, and may consist of iron or wood.

B is an iron cylinder, which I will term the "sheathing-cylinder," which is fitted to the stationary spile in the manner and for the purpose hereinafter described.

E is an iron cylinder, preferably rounded and closed at the top, for reasons hereinbefore stated, which I will term the "rotating cylinder." This cylinder is placed over and around the spile A and extends down nearly to the floor of the dock, and which spreads out near the bottom in the form of a flange, *e' e'*, to prevent the hawser F from falling below it, (the flange.)

Between the stationary spile A and the rotating cylinder E, or, if the sheathing-cylinder B is employed, then between the said cylinder and the rotating cylinder, there is left a space for, and in which is placed a series of, cylindrical anti-friction rollers, D D D, which take the strain or tension of the hawser and rotate by rolling action on the inner surface of the rotating cylinder E. Each of these anti-friction rollers is provided both at the top and bottom with a pinion, *c c c*, and the bottom end of each, as seen in Fig. 1, is rounded to diminish friction. *e e* (seen in Figs. 1 and 2) is a projection, of suitable thickness, cast on the inside of the rotating cylinder E and extending inward somewhat less than the diameter of the rollers D D D, (best seen in Fig. 1,) and in which are provided a series of slots, *d d d*, corresponding to the series of rollers, and which are in the form of the letter U, and in which the pinions *c c c* of the tops of the rollers work and are held to keep them (the rollers) in a vertical position and out of contact with each other to avoid friction.

The lower end of the rotating cylinder E is projected inward somewhat less than the diameter of the rollers, which, for convenience of inserting the rollers D D D, may be made separately and bolted onto the rotating cylinder, as shown (*f f*) in Fig. 1. The object of this projection *f f* is to afford a vertical support for the rollers, which said support shall rotate with and so constitute a part of the rotating cylinder E; hence this projection is to be considered as a part of the rotating cylinder E, though in the drawings it is shown as cast separately. In this projection *f f* at the bottom of the rotating cylinder is provided a series of U-shaped slots corresponding to the similar slots in the projections *e e* at the top of the rollers, in which the pinions of the bottom ends of the rollers are held to keep them (the bottom ends of the rollers) in respective vertical lines with the tops of the same and out of contact with each other. These slots in the projections (*e e* at the top and *f f* at the bottom) are made sufficiently deep to prevent any force which is applied to the spile by the hawser F from falling on the pinions of the rollers, which allows all of said force to bear upon the body of the said rollers.

The means whereby I prepare the stationary spiles to receive the above-described rotating device in cases where the existing stationary spiles are not or cannot otherwise be fitted to receive it, consists of the sheathing-cylinder B and the manner of adapting and fitting a single size of the same to spiles of irregular

form and of various sizes. This sheathing-cylinder B, made of suitable and uniform thickness, is first placed over and around the stationary spile A, whatever be its form or size, if the said cylinder will but pass over it. This sheathing-cylinder is then set and temporarily secured (by whatever means) in a vertical position, with the stationary spile standing practically in the center thereof, and while in this position the irregular space between it and the spile is filled in with suitable cement or concrete, *a a*, Fig. 3, composed of finely-broken stone or coarse sand and cement, which, when it (the cement) sets and becomes hard, holds the cylinder B securely and immovable to the spile, and thus furnishes a specifically-sized spile, with a metallic surface and a true circular form, ready to receive the above-described rotating apparatus, and thus rendering the said rotating device adapted to many spiles, which otherwise would be useless for the same.

Between the top of the fixed spile A and the rotating cylinder E is or may be more or less space, as shown in Fig. 1. The rotating cylinder, therefore, may rest on and in direct contact with a more or less rounded top of the stationary spile, or preferably upon a heavy washer, *g*, which I term "suspending-washer," interposed between the top of the stationary spile A and the rotating cylinder E, and upon which said washer rests the entire weight of the whole rotating apparatus, as above described.

To keep the rotating cylinder from being lifted off the stationary spile, a heavy and powerful bolt, *h h*, passes through the center of the top of the rotating cylinder, which is screwed into the stationary spile, as shown in Fig. 1, the hole in the rotating cylinder being somewhat larger than the bolt *h h* to allow any small possible lateral motion of the said cylinder caused by the action of the hawser.

G G is a limited flooring laid around the spile, and projects and extends under the flange *e' e'* of the rotating cylinder, the object of this limited flooring being to prevent the hawser from getting underneath the flange *e' e'*; and the flange *e' e'* is placed somewhat above the bottom of the rotating cylinder to bring the hawser a way above the bottom of the rollers D D D. It will be seen, therefore, that by the employment of the limited flooring G G it obviates the necessity of sinking the spile-cap into the main flooring of the dock, besides keeping the hawser F up a way from the main floor C C of the dock, which is desirable in order that it (the hawser) may render better over the "string-piece" of the dock. It will be observed, also, that there is a space between the bottom of the rotating cylinder and the main floor C C, and between the bottom of the flange *e' e'* and the limited flooring G G, thus preventing all contact between the rotating apparatus and the floor and between the stationary spile and rotating apparatus save through the medium of the anti-friction rollers D D D and the suspending-washer *g* at the top.

Having so fully described the various parts of my device and the functions which they respectively perform, only a brief general explanation of the operation of my invention is needed.

When the loop of a hawser, *F*, is passed over the rotating cylinder *A*, the slightest friction between it (the hawser) and the said cylinder causes it (the cylinder) to rotate as the other end of the hawser changes lateral position, thus preventing all slipping and consequent friction between the said cylinder and hawser. Each roller being held in an exact vertical position by means of the slots *d d d* and pinions *c c c*, and thereby kept from touching each other, there is no action or friction to any part of the rotating device more than that which is caused by the rolling motion of the rollers *D D D* on the inner surface of the rotating cylinder *A*, which is but trifling, even when submitted to any amount of force capable of being transmitted by the most powerful steamships and hawsers.

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

1. In combination with a hawser-spile, *A*, the sheathing-cylinder *B* and concrete *a a*, the said concrete occupying and filling the irregular space between the spile and the said cylinder, whereby the cylinder becomes fitted and immovably fastened to the spile and the spile made round and iron-covered, substantially in the manner and for the purposes described.

2. In combination with the hawser-spile *A*, the rotating cylinder *E* and anti-friction rollers *D D D*, the said rollers resting and rotating on the outer surface of the spile and on the inner surface of the said rotating cylinder, whereby by the action of the hawser *F* the

said cylinder can be revolved around the spile upon the said rollers without causing material friction, however great be the lateral strain which may be applied thereto, substantially in the manner and for the purpose set forth.

3. In combination with the hawser-spile, the rotating cylinder *E*, having between it and the spile *A* the anti-friction-rollers *D D D*, the sheathing-cylinder *B*, having between it and the spile *A* the concrete filling *a a*, substantially in the manner and for the purpose described.

4. In a rotating hawser-spile, as above set forth, the circular slotted projections *e e* and *f f*, having the U-shaped slots *d d d*, in which is held the ends of the anti-friction rollers *D D D*, and whereby the said rollers are held up and kept in a vertical position and carried around with and are revolved by the rotating cylinder *E* around the spile *A*, substantially as and for the purpose set forth.

5. In a rotating hawser-spile, as above set forth, the suspending-washer *g*, centrally located and resting on the top of the spile *A* and upon which said washer rests the rotating cylinder *E*, the holding-bolt *h*, passing through the top of the said cylinder and said washer and screwed into the said spile, in combination with the said spile and the rollers *D D D* and said rotating cylinder, whereby the said rotating cylinder containing the said rollers is suspended from the top of the spile *A* and held up from contact with the floor of the dock and prevented from being lifted off of the said spile, substantially in the manner and for the purpose described.

FRANK G. JOHNSON.

Witnesses:

EDWARD F. O'DWYER,
FRANK R. JOHNSON.