(No Model.) 2 Sheets—Sheet 1.

C. E. JONES.

Expansion Pulley.

No. 234,876. Patented Nov. 30, 1880.

Fig. 1.

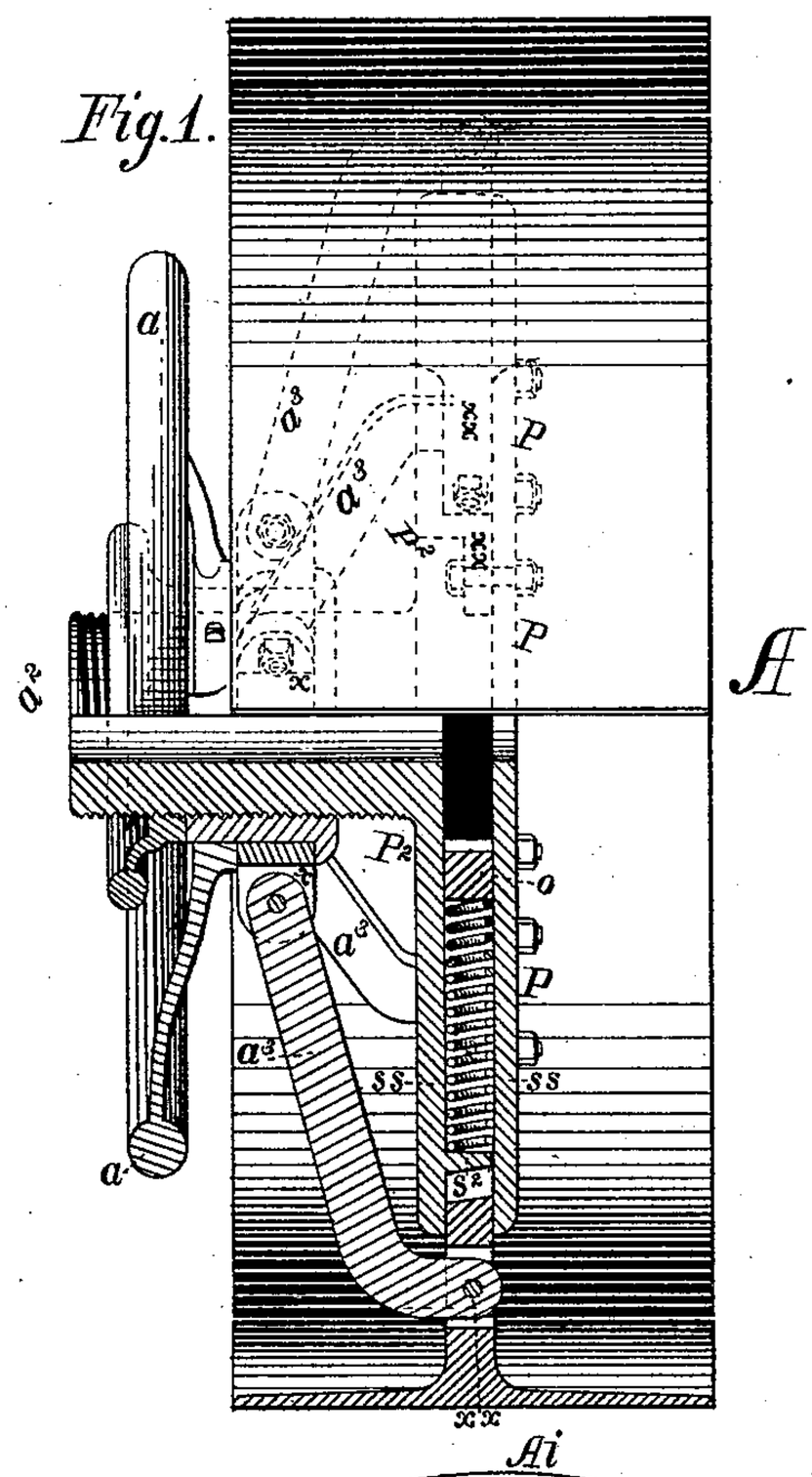
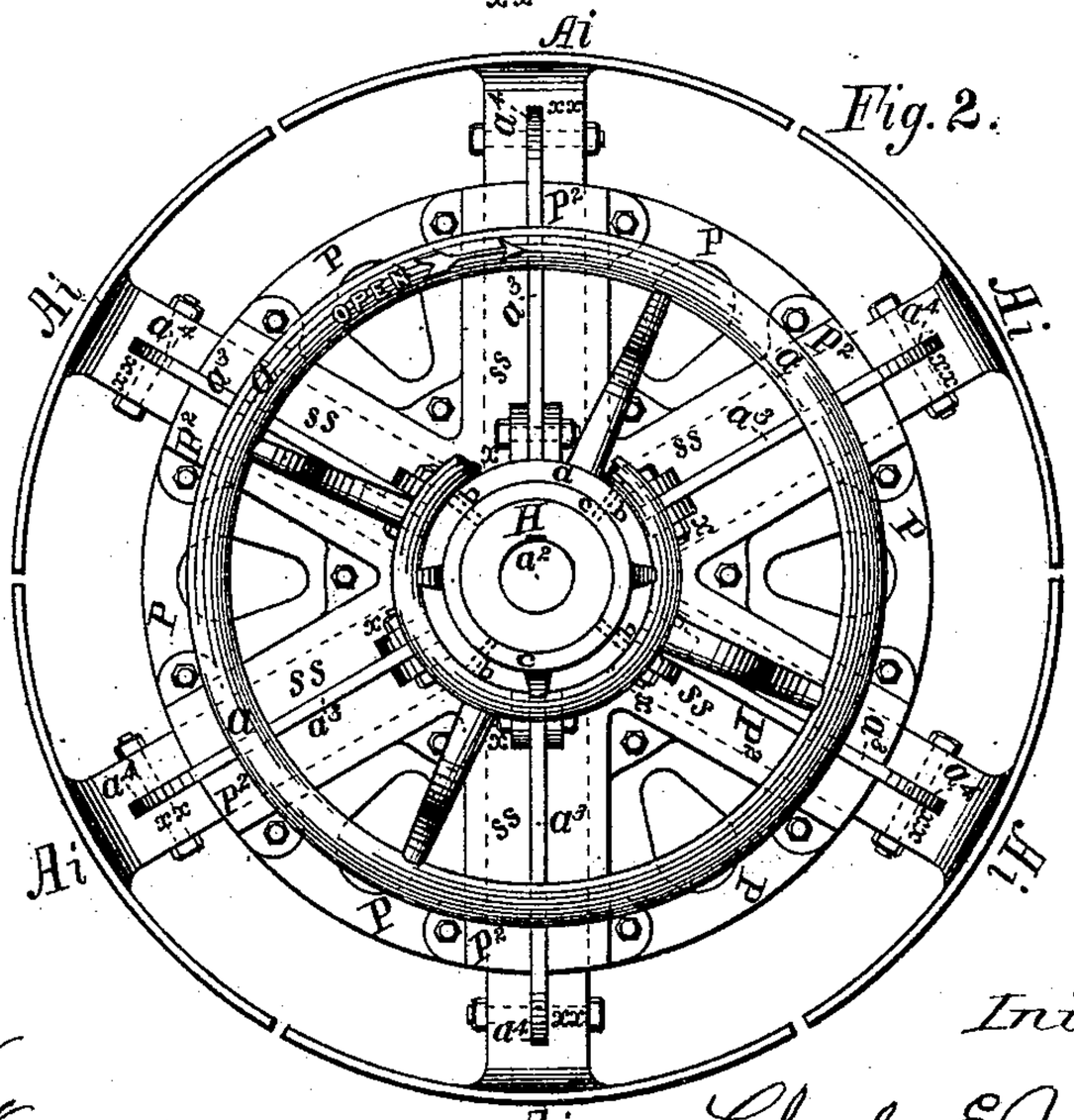


Fig. 2.



Witnesses.
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David S. Foster

Inventor
Charles E. Jones.

(No Model.) 2 Sheets—Sheet 2.

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Expansion Pulley.

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Fig. 3.

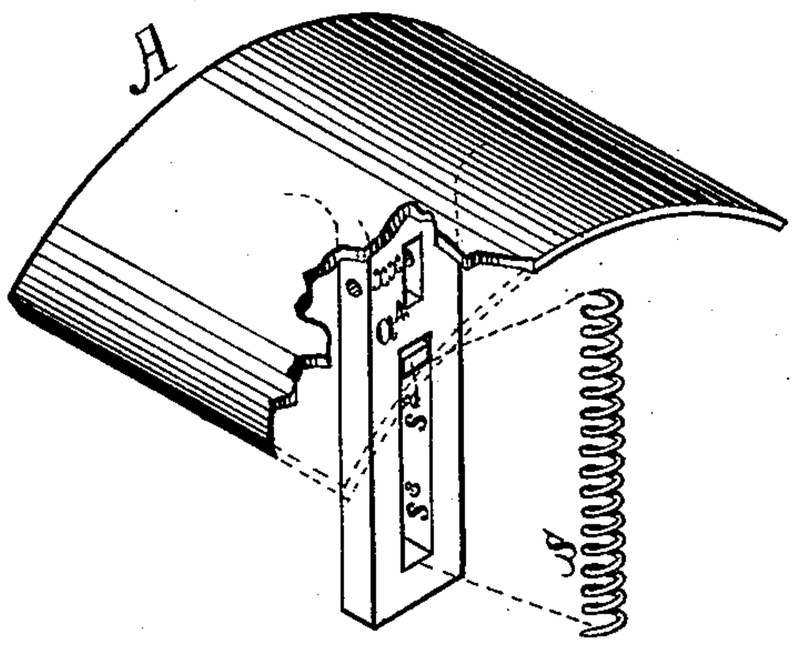


Fig. 4.

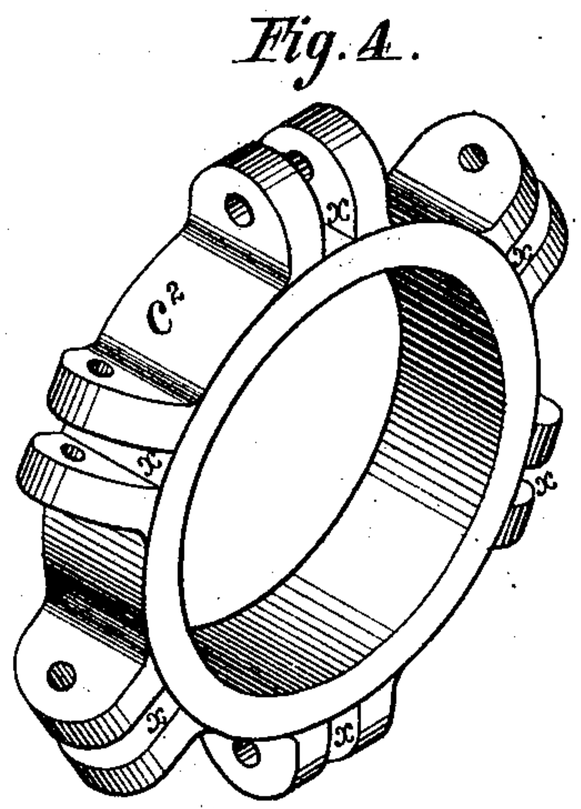


Fig. 5.

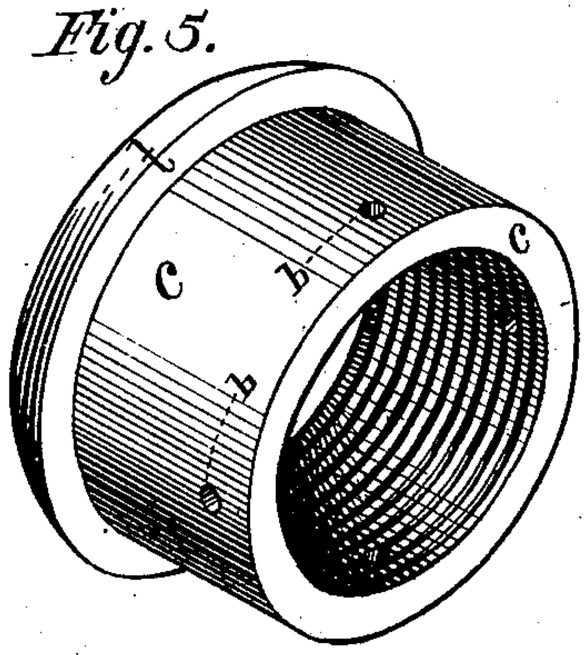
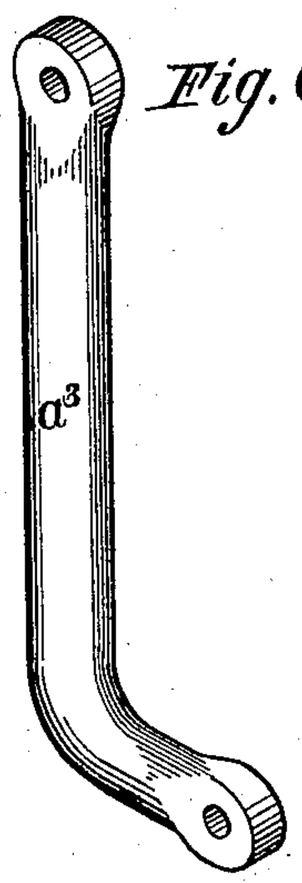


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES E. JONES, OF BELOIT, WISCONSIN.

EXPANSION-PULLEY.

SPECIFICATION forming part of Letters Patent No. 234,876, dated November 30, 1880.

Application filed October 19, 1880. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. JONES, of the city of Beloit, in the county of Rock and State of Wisconsin, have invented a certain new and useful Improvement in Expansion-Pulleys; and I do hereby declare, on oath, that my invention has not been patented to myself, or to others with my consent or knowledge, in any foreign country, and of which the following is a specification.

My invention relates to improvements in expansion-pulleys, chiefly employed in paper-mills for driving the drying and calendering cylinders of such mills; and the object of my improvement therein is to produce an expansion-pulley much less complicated in construction, less liable to get out of repair, more effective, safe, easy, and convenient of adjustment and manipulation by the operator, and also much reduced in the cost of manufacture over those heretofore in use; and the particular practical purpose of my invention is to provide the manufacturers of paper of all kinds with an expansion-pulley which shall at once perfectly meet and completely supply the existing want for such a peculiar piece of mechanism in the manufacture of paper, which is required to perfectly equalize the tension of the paper web of varying thickness while passing through the "paper-machine," so called, consisting of the drying and calendering cylinders thereof, it being understood that in passing through the drying and calendering cylinders the newly-formed paper web will contract in length exactly proportionate to its varying thickness, if any, and that the thinner web will contract more rapidly than the thick, and which will also be more or less affected by varying heat of the cylinders, if any. Now, this varying tension of the web must constantly be kept equalized by suitably increasing or diminishing the revolving speed of the cylinders; otherwise much loss of material and time and great inconvenince would result, caused by frequent breaking of the web, stoppage of the machine, and the like. I attain these objects by means of the mechanism and the method of operating the same hereinafter set forth, and illustrated in the accompanying drawings, in which—

Figure 1 is an isometrical perspective of my improved expansion-pulley complete, save that one section of the periphery is removed so as to show a section of the internal mechanism of the pulley. Fig. 2 is a similar view of the front side or end of the pulley. Fig. 3 is a like view of a detached section of the side or end of the pulley with appurtenant mechanism. Fig. 4 is a similar view of the collar of the pulley, to which the inner ends of the six angular lever-arms for expanding and contracting the pulley are pivoted. Fig. 5 is a like view of a screw-threaded nut-collar, to which the hand-wheel shown at Fig. 2 is bolted, and by means of which hand-wheel the pulley is operated; and Fig. 6 is a similar view of one of the six angular lever-arms for expanding and controlling the pulley.

Similar letters refer to similar parts throughout the several views.

A, Fig. 1, represents the pulley complete, except that one section of the periphery is removed to exhibit a part of the internal mechanism of the pulley.

A *i*, Fig. 2, represent the six several sections into which the periphery of the pulley is divided. Each of the sections is cast solid upon and with the radial arms a^4, which move in the sleeves S S, formed upon and within the back faces of the arms of the inner plate or so-called "spider," P^2, which is cast solid with the hub H. These arms extend radially to the periphery of the circular rear face-plate, P, which plate P is firmly bolted to the inner plate or spider, P^2.

The radial arms a^4 each have a slot, S^3, in which is placed the spiral spring S, its lower end resting against the bottom of the slot S^3, and the upper end against the lower side of the projecting stop S^2, cast solid on the inner side of the arms of the plate or spider P^2. The function of the spring S^3 is to hold the arms a^4 firmly down toward the center of the pulley for the purpose of maintaining the uniform radius of the periphery of the whole pulley. The sections A *i* upon and with the arms a^4 are actuated in expanding or contracting the pulley by angular arms a^3, which are pivoted to the arms a^4 at their outer ends by bolts at *x x* and at their inner ends to the collar C^2 by similar bolts at *x*, all as shown. The collar C^2 is fitted to move freely upon the screw-threaded

nut-collar C laterally between the flange *t* thereof on the inner vertical surface of the hub of the hand-wheel *a*, which is fitted tightly upon and rigidly fixed to the nut C by bolts *b*, as shown.

H is the solid hub of the pulley fitted to the shaft a^2, as shown at Fig. 2. The hub H has a suitable screw-thread cut thereon, corresponding to that cut in the nut-collar C, which rotates freely upon the hub H; and said nut-collar C being rigidly bolted to the hub of the hand-wheel *a*, it will be plainly seen and understood that when the hand-wheel *a* is turned in the direction of the arrow the collar C^2, with the angular lever-arms a^3 connected thereto, as set forth and shown, will be carried inward toward the vertical center of the pulley, and thus, by means of the angular lever-arms a^3, outwardly extending the radial arms a^4, and thereby expanding the circumference of the pulley to any desired extent within the expansive capacity thereof, and by rotating the hand-wheel *a* in the opposite direction the pulley will be contracted in the direct ratio of its expansion, as herein stated. In Fig. 2 the pulley is shown as being partially expanded.

My improved expansion-pulley is operated by simply turning the hand-wheel *a* to the right or left, as may be required, to perfectly regulate and equalize the tension of the paper web in process of drying and calendering while passing through or over the cylinders of the paper-machine, whereby also much damage and loss in material, detention, and other means are avoided and prevented by using expansion-pulleys containing my invention; and also my pulley may be manipulated with entire safety to the operator, which is not an unimportant feature in this invention; and my improvements therein consist chiefly in cutting a screw-thread upon the hub H, the screw-threaded nut-collar C, loose collar C^2, angular lever-arms a^3, and spiral spring S, with appurtenant mechanism, when arranged substantially as set forth and shown.

I am aware that prior to my invention expansion-pulleys have been made with varying methods of operating the same. I therefore do not claim such invention as a whole, broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In an expansion-pulley, the hub H, having a screw-thread cut thereon, the screw-thread nut-collar C, loose collar C^2, angular lever-arms a^3, and spiral spring S, substantially as and for the purpose specified and shown.

2. The combination, in an expansion-pulley, of the hub H, having a screw-thread cut thereon, the screw-thread nut-collar C, loose collar C^2, angular lever-arms a^3, and spiral spring S with the pulley A, consisting of the sections A *i*, radial arms a^4, slot S^3, stop S^2, sleeves S S, the plate or spider P^2, having radial arms, as described, the face-plate P, and hand-wheel *a*, with appurtenant minor mechanism, as shown, when the whole is constructed and arranged to operate substantially as set forth and shown.

CHARLES E. JONES.

Witnesses:
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DAVID S. FOSTER.