

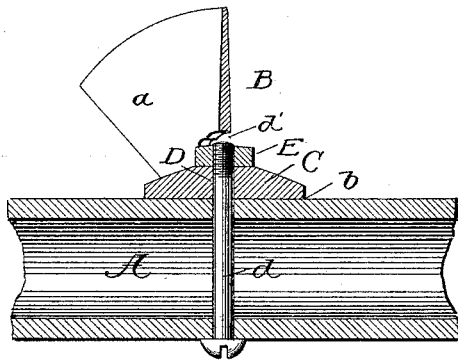
(No Model.)

J. J. RYMAL.  
CONVEYER.

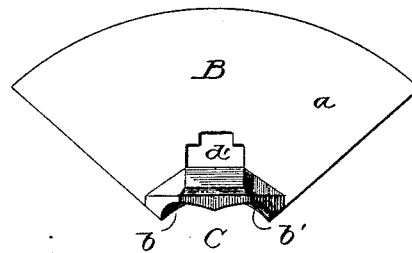
No. 459,113.

Patented Sept. 8, 1891.

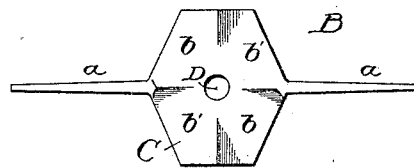
*Fig. 1.*  
*on line x-x*



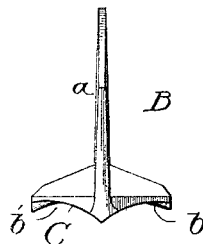
*Fig. 2.*



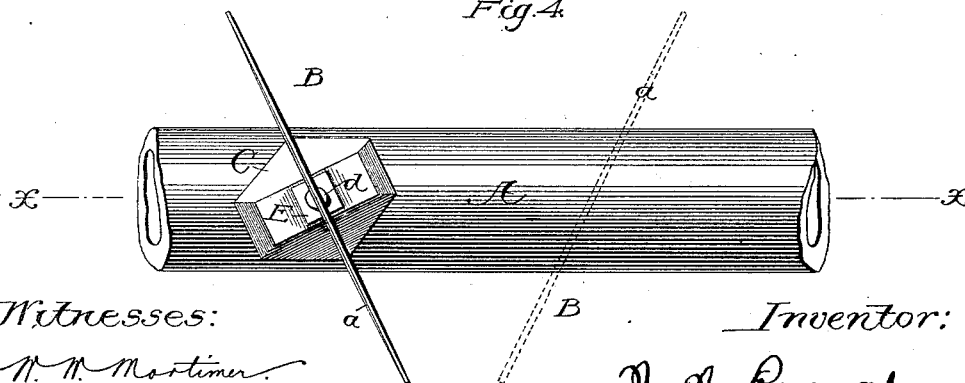
*Fig. 3.*



*Fig. 5.*



*Fig. 4.*



Witnesses:

*N. H. Mortimer.*

*A. R. Kennedy.*

Inventor:

*J. J. Rymlal*  
*By Phil T. Dodge*  
*Atty.*

# UNITED STATES PATENT OFFICE.

JOHN JEROME RYMAL, OF MINNEAPOLIS, MINNESOTA.

## CONVEYER.

SPECIFICATION forming part of Letters Patent No. 459,113, dated September 8, 1891.

Application filed January 19, 1891. Serial No. 378,380. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN JEROME RYMAL, a citizen of the United States, residing at the city of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Conveyers, of which the following is a specification.

My invention relates to that class of screw conveyers for use in mill machinery, &c., in which provision is made for reversing the direction in which the material is conveyed without changing the direction of rotation of the conveyer-shaft by reversing the position of the flights upon the shaft.

The object of the invention is to provide a conveyer of this character which will be simple in construction, durable, and inexpensive, and in which the reversal of the individual flights may be readily and easily effected with the loss of a minimum amount of time.

With this end in view the invention consists, primarily, in combining with the conveyer-shaft a series of flights, each having at its inner end an expanded head or base, which is formed on its under side with reversely-disposed cavities constructed to fit upon the conveyer-shaft and an independent removable bolt and nut for securing the flight removably upon the shaft.

It consists, also, in providing the flight with a perforation through its base for a fastening-bolt and with a recess for the nut, so that in applying the flight to the shaft the nut may be first placed in the recess and the bolt passed through the shaft and flight and screwed into the nut.

It also consists in the details of construction and combination of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a longitudinal vertical section through a portion of the conveyer-shaft and one of the flights on the line *xx* of Fig. 4. Fig. 2 is a side elevation of one of the flights detached. Fig. 3 is a bottom plan view of the same. Fig. 4 is a top plan view of a portion of the shaft and one of the attached flights. Fig. 5 is an edge view of one of the flights.

Referring to the drawings, A represents a conveyer-shaft of suitable material, which

may be either solid or, as represented in the drawings, tubular.

B represents one of the flights applied to the shaft at an angle thereto, as usual. They are applied on opposite sides of the shaft, as shown in dotted lines in Fig. 5, constituting an ordinary screw conveyer.

Each of the flights is composed of the flat wing or blade *a* and the expanded base or head C at its inner end and preferably formed integral therewith. The base is formed on its under surface with cavities or bearing-surfaces *b b'*, adapted to fit upon the outer surface of the shaft and extending diagonally across the base of the flight in reverse directions, so that when the flight is seated upon the shaft with one of the cavities fitting upon its outer surface the blade will extend in a plane inclined from the longitudinal axis of the shaft, and when seated upon the shaft with the other depressions fitting therein the blade will extend in a reverse plane.

In order that the flight may be secured to the shaft in a manner to permit of its ready removal or application, I perforate the base, as at D, for the reception of a fastening-bolt *d*, and form in the blade *a* immediately above the base a recess *d'*, extending through the blade and communicating with the perforation. The recess is formed to receive a nut E, and is of such form that the nut will fit snugly therein and be prevented from turning on the bolt.

In proceeding to fasten the flight upon the shaft the former is first seated thereon with one or the other of the cavities fitting upon its outer surface, according as it is desired to convey the material in one direction or the opposite, and the nut is seated in the recess. The bolt is then passed through a hole in the shaft, through the perforation in the base of the flight, and screwed into the nut until the parts are drawn tightly together. When it is desired to reverse the flight, it is only necessary to unscrew the bolt until sufficient space exists to permit the flight to be lifted free of the surface of the shaft and turned on the bolt until the reverse cavities fit on the shaft, when the bolt is again screwed up to tighten the parts.

It will be seen that in the employment of

my construction it will not be necessary to cut or alter the conveyer-shaft to adapt it to receive the flight other than to provide it with perforations to receive the fastening-bolts, in-  
5 as much as the cavities in the under surface of the base of the flight are of such shape that they conform to the general contour of the surface of the shaft and fit closely thereon.

While I have shown and described the base  
10 of the flight provided with but two bearing-surfaces adapted to admit of but two reverse adjustments of the same, it is to be understood that more than two bearing-surfaces or cavities may be employed in order to provide  
15 for intermediate adjustments of the flight from one extreme to the other, the essence of the invention residing in the provision for reversing the direction in which the material is conveyed by bringing one or the other of  
20 reversely-disposed cavities into engagement with the conveyer-shaft.

Having thus described my invention, what I claim is—

1. In combination with the perforated shaft,  
25 the conveyer-flight having the base with the

reversely-arranged cavities therein to receive the shaft, an independent removable fastening-bolt passing through the shaft, and a nut applied to the bolt, substantially as described.

2. The combination, with the conveyer-  
30 shaft provided with the bolt-hole, of the flight seated upon the shaft and provided with the recess and perforation, the bolt extending through the shaft and perforation in the flight, and the nut screwed upon the bolt and  
35 seated in the recess.

3. The reversible flight for conveyers, provided with the expanded base formed with the reversely-disposed bearing-surfaces and the bolt-hole, said flight provided above the  
40 base with the recess to receive a nut and formed to prevent its rotation, said recess communicating with the perforation in the base, whereby the nut may be seated in the recess and the bolt passed through the per-  
45 foration and screwed into the nut.

JOHN JEROME RYMAL.

Witnesses:

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