(No Model.)

H. BIRKHOLZ.

CONVEYER.

No. 455,384. Patented July 7, 1891.

Fig. 1.

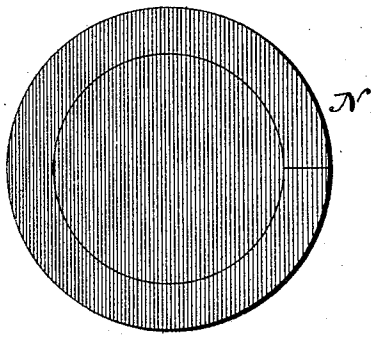


Fig. 2.

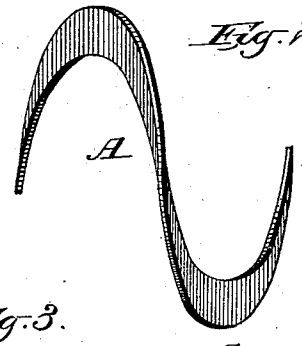


Fig. 3.

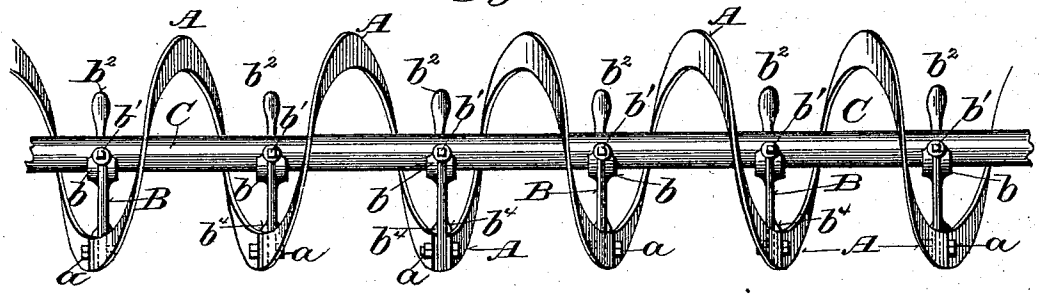


Fig. 4.

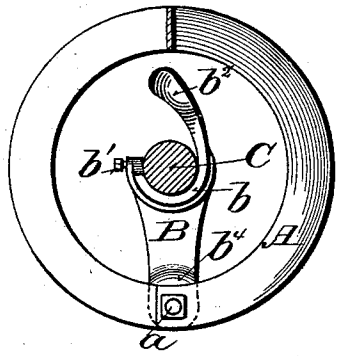
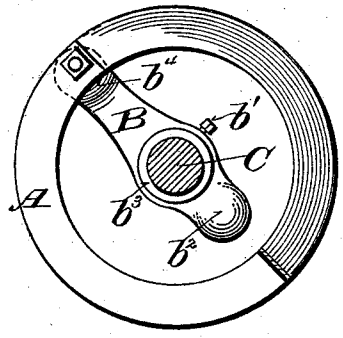


Fig. 5.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HANS BIRKHOLZ, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO EDWARD P. ALLIS & CO.; MARGARET W. ALLIS, WILLIAM W. ALLIS, EDWARD P. ALLIS, JR., CHARLES ALLIS, AND EDWIN REYNOLDS, ALL OF MILWAUKEE, WISCONSIN, EXECUTORS OF EDWARD P. ALLIS, DECEASED, SOLE MEMBER OF THE FIRM OF EDWARD P. ALLIS & CO.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 455,384, dated July 7, 1891.

Application filed February 23, 1888. Serial No. 264,924. (No model.)

To all whom it may concern:

Be it known that I, HANS BIRKHOLZ, of the city and county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Conveyers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide a conveyer with a continuous spiral, which may be reversed and readily attached to or removed from the conveyer-shaft in sections without removing said shaft from its bearings.

It consists, essentially, of a sectional sheet-metal spiral and of removable arms adjustably secured to the conveyer-shaft and attached to the ends of the spiral sections, together with certain peculiarities of construction and arrangement hereinafter specifically set forth.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a view of a sheet-metal blank from which one of the spiral sections is cut. Fig. 2 is a view of one of said sections as cut and bent. Fig. 3 is a side elevation of a conveyer embodying my improvements, the end to the right showing a right-hand spiral and the end to the left a left-hand spiral. Fig. 4 is a cross-section of the conveyer on an enlarged scale, and Fig. 5 is a similar view of a modification.

A A represent the spiral sections, which are cut or punched in annular form from blanks, such as N, (shown in Fig. 1,) and radially severed on one side. The ends are then bent laterally in opposite directions to give the section an approximately helical or spiral shape.

B B are arms, each formed at one end with a bifurcation or segmental collar *b*, which is fitted over one side of the conveyer-shaft C, and preferably has a lateral opening of sufficient size to allow it to be placed upon said conveyer-shaft from the side. One limb or side of each collar *b* is formed with a screw-threaded perforation to receive a set-bolt *b'*, which bears at the tip against the conveyer-shaft C a little past its center when the collar is properly placed thereon. The remaining limb or side of each collar is preferably prolonged and formed into a counter-weight b^3, by which the arm B is counterbalanced. The outer ends of the arms B are perforated in a line parallel with the conveyer-shaft, and the ends of the spiral sections A A are also perforated to receive bolts *a a*, which pass through the overlapping ends of the contiguous sections and the adjacent arms B, and thus join said sections together in a continuous spiral and secure the same in place to the several arms B B. The arms B B are disposed along the conveyer-shaft C at suitable intervals, according to the pitch of the spiral, and are rigidly secured thereon by the set-bolts *b' b'*, as seen in Fig. 3.

The pitch or inclination of the spiral may be varied as desired by simply moving the arms B B on the conveyer-shaft C nearer together or farther apart. The direction of the spiral may also be reversed, when desired, by bending the ends of the sections A A in reverse directions, so as to change the spiral from right to left, or vice versa, the sheet metal of which the spiral sections are made being sufficiently thin and flexible to permit of their being readily bent in that manner.

Referring to Fig. 5, a modification of the arm B is shown, in which an entire collar b^3 is employed in place of the segmental collar *b*, hereinbefore described. This construction permits of the adjustment of the arms B lengthwise of the conveyer-shaft C; but it does not allow of their being placed upon or removed from the conveyer-shaft except over the ends thereof.

The collar b^3 is provided with a set-screw *b'*, and on the side opposite the arm B is formed with a counter-weight b^2. To prevent

the spiral from turning upon the bolts *a a* and to rigidly hold the same concentric with the conveyer-shaft C, I form on the sides of the arms B B transverse shoulders b^4 b^4, which abut against the inner edge of the spiral, as shown in Figs. 3, 4, and 5.

I claim—

1. The combination, in a conveyer, with a rotary shaft provided at intervals with arms, of a continuous spiral passing a number of times around said shaft and composed of flexible sheet-metal sections, which are detachably connected with each other at the ends and are detachably connected with said arms, so as to be capable of reversal and separately removable without disturbing the conveyer-shaft in its bearings, substantially as and for the purposes set forth.

2. The combination, in a conveyer, with a rotary shaft provided with arms adjustable lengthwise of said shaft, of a spiral passing a number of times continuously around said shaft and composed of flexible sheet-metal sections connected with each other and attached to said arms, substantially as and for the purposes set forth.

3. The combination, in a conveyer, with the conveyer-shaft, of arms formed at one end with segmental collars fitted over one side of said shaft and provided with set-bolts by which they are adjustably secured on said shaft, and a spiral composed of sections which are joined together at the ends and attached to said arms, substantially as and for the purposes set forth.

4. The combination, in a conveyer, with the conveyer-shaft, of detachable arms formed with segmental collars to fit over the side of said shaft and provided with set-bolts for securing them thereon and perforated at their outer ends, and a spiral composed of sections perforated at the ends, which are overlapped and secured together and to the adjacent arms by bolts passing through the perforations therein, substantially as and for the purposes set forth.

5. The combination, in a conveyer, with the conveyer-shaft, of arms formed with segmental collars, which are adjustably secured upon said shaft and provided with counter-weights projecting upon the opposite side of said shaft from said arms, and a spiral composed of sheet-metal sections which are attached at the ends to said arms, substantially as and for the purposes set forth.

6. The combination, in a conveyer, with a rotary shaft provided with a number of separately-removable arms, of a spiral passing a number of times continuously around said shaft and composed of separately-removable sheet-metal sections connected with each other at the ends and attached to said arms, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HANS BIRKHOLZ.

Witnesses:
P. E. ROSWALL,
A. E. BAXTER.