

March 23, 1937.

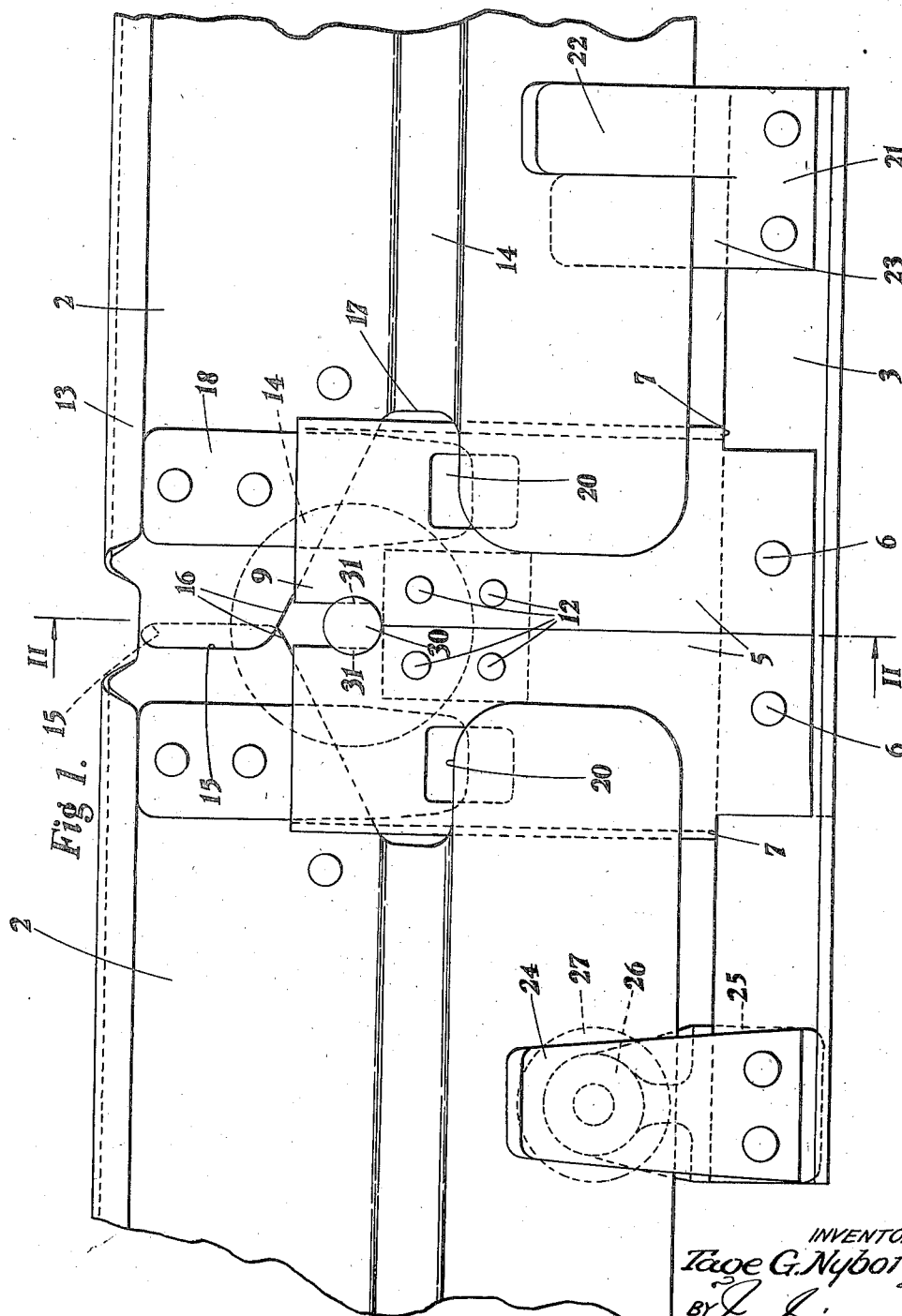
T. G. NYBORG

2,074,804

BELT CONVEYER

Filed Sept. 18, 1935

2 Sheets-Sheet 1



INVENTOR
Tage G. Nyborg

BY *[Signature]*

ATTORNEY

March 23, 1937.

T. G. NYBORG

2,074,804

BELT CONVEYER

Filed Sept. 18, 1935

2 Sheets-Sheet 2

Fig. 2.

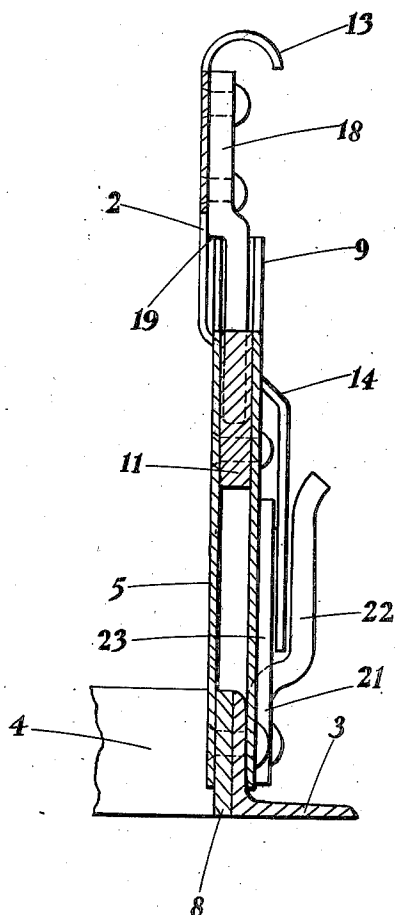
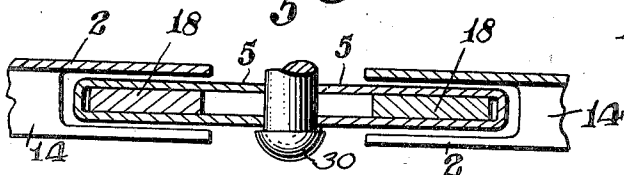


Fig. 3



INVENTOR
Tage G. Nyborg

BY *J. H. Swire*
ATTORNEY

UNITED STATES PATENT OFFICE

2,074,804

BELT CONVEYER

Tage Georg Nyborg, Worcester, England, assignor
of one-half to The Mining Engineering Com-
pany Limited, Worcester, England

Application September 18, 1935, Serial No. 41,165
In Great Britain December 5, 1934

7 Claims. (Cl. 198—204)

This invention relates to belt conveyers and frame constructions therefor, and more particularly to such conveyers when they are made in sections for easy erection and dismantling.

5 In conveyers intended for use in mines, or other places, where the erection and dismantling has to be carried out in difficult circumstances, it is desirable that each part should be of the smallest overall dimensions consistent with having rela-
10 tively few parts and giving great strength and rigidity when erected.

In the improved conveyer construction side plates are provided which are located in simple roller frames by means of pegs or the like, these
15 pegs being adapted to enter into suitable sockets, and the disposition of the side plates and these pegs and sockets is such that whilst the upper portions of the side plates are located within the roller frames, the lower portions of the side
20 plates are located outside or towards the outside of the roller frames.

To suit this disposition of the side plates the intermediate portions of these, between the upper and the lower portions, are set or outwardly
25 and downwardly bent at a suitable angle in relation to the vertical plane.

Such a construction of the side plates enables them to be made relatively light in weight, and therefore easy to handle, whilst being relatively
30 of great strength and rigidity. Another feature of such a construction is that the upper portions of the side plates may thus be disposed so as to lie relatively close to the upper or loaded run of the belt, which generally speaking runs in a
35 straight line, whereas the lower portions of the side plates lie well clear of the lower or unloaded run of the belt, which is apt to sway or run out of the straight line.

The locating pegs may be attached to, or form a part of, the side plates, the locating sockets then being attached to, or forming a part of, the roller frames, or vice versa, as desired.

In adaptations of this invention where the sockets are attached to, or form a part of, the roller frames, holes or ports may be provided in the
45 sides of the sockets to allow of the free egress of coal dust, or other refuse, which might otherwise accumulate within the sockets and obstruct or prevent the entry of the pegs.

50 Brackets at each end of the longitudinal foot angles are used to guide the bottom edge of the side plates in addition to one pair being used as supports for the bottom roller spindle.

Other parts of the invention are embodied in
55 the preferred form of conveyor, which it is now

proposed to describe by way of example, with reference to the accompanying drawings; the aspects of the invention for which a monopoly is sought will be found set out in the claims.

In the drawings:—

Figure 1 is a side view of a roller frame and the adjacent ends of a pair of side plates, and

Figure 2 is a section on the line II of Figure 1.

Figure 3 is a broken transverse section taken through the box members.

The complete conveyer comprises a number of roller frames joined by side plates 2, and each roller frame has a base or foot comprising two parallel longitudinal angle members 3 connected by transverse angle members 4. Opposing up-
15 rights are secured to the longitudinal angle members of each frame. In the form illustrated each upright is built up from a pair of U-shaped metal plate members 5 arranged with their open sides
20 abutting to form an open-topped box and secured to the feet by riveting 6; the plates are further connected by a plate 11 to which each is secured by riveting 12. These uprights will be hereinafter referred to as "box members". The closed
25 side of each U-shaped member is cut away, as at 7, from an appropriate distance from the bottom to allow the members to straddle the upstanding flange of the individual angle members of the foot, packing pieces 8 being inserted if required, through which the rivets also pass.

The abutting portions of the inner legs of the U-shaped members of each box member are cut away from the top as at 9 to form a bearing for one end of a roller 10 provided for the support of the upper run of the conveyer belt. The spindle
35 30 of the roller is notched as indicated at 31 to receive the edges of the U-shaped members and locate the spindles.

When the conveyer is erected, adjacent roller frames are connected by a plate 2 on each side of the conveyer. The upper edge of each of these plates is curved or bent outwardly at the top to form a roll or flange 13, and each plate is bent outwardly and downwardly at an angle of preferably about 45° on a longitudinal line approxi-
45 mately halfway down the plate, as at 14. The sloping portion of the plate extends outwardly a horizontal distance greater than the transverse width of the box members, and the plate is then continued downwardly parallel to its upper half.

At the ends of the plates the upper vertical portion has a vertical end edge 15 extending downwardly for about half its height, that is approximately a quarter of the height of the plate, and this edge is continued by an inclined
55

edge 16 which runs downwardly at an angle of about 30° to the horizontal away from the end of the plate until it meets the upper edge of the outwardly sloping portion of the plate. The substantially wedge shaped end portion of the plate thus formed has a horizontal length slightly greater than half the length of the box members.

The ends of the outwardly sloping portion of the plate are cut away so as to form an edge 17 running outwardly at right angles to the plane of the plate from the point at which this sloping portion is joined by the inclined end edges 16 of the upper half of the plate. The lower portion of the plate below the outwardly inclined portion extends at each end beyond its junction therewith a distance somewhat less than half the length of the box members.

At each end of each plate, a metal peg is riveted to the outside of the substantially wedge shaped portion of the plate a small distance inside the centre of the wedge shaped portion. The pegs are of rectangular cross section and each is cranked outwardly from the plate to form a shoulder 19 and to provide a space between itself and the lower portion of the wedge shaped portion. When connecting two roller frames in the assembly of the conveyer, the pegs at the ends of a plate are inserted in the adjacent spaces formed in the interior of the two box members between the plates 11 and the closed ends of the U-shaped members, until the shoulders in the pegs come into contact with the upper edges of the inner walls of the box members as shown in Figure 2. The ends of the substantially wedge shaped portions of adjacent plates come to overlap inside the plane of the insides of the box members, and the lower portions of the plates to lie outside the box members. The ends of the pegs are tapered to facilitate their insertion and in order that the insertion of the pegs may not be prevented or rendered difficult by the accumulation of coal dust or refuse within the box members, two holes 20 are cut in the outer wall of each box member extending each to a point below the level which the ends of the pegs reach when fully inserted.

Guides for the lower edges of the plates are provided one at each end of the longitudinal foot member of the roller frames. These guides are riveted to the outside of the upstanding flange of the foot. The guide at one end of the longitudinal member takes the form of a piece of sheet metal split for a distance down from the top, one portion 22 so formed being bent outwardly and upwardly, so that the lower edge of the plate may be inserted between it and the other portion 23 at the same time as the pegs are inserted in the box members. The upper edge of the outer portion 22 is bent outwardly to facilitate the entry of the plate.

The guide member at the other end of each longitudinal member comprises a piece 24 of sheet metal and a piece 25 which may be a cast iron bracket, riveted one to the outside and the other to the inside of the upstanding flange of the foot, the outer one 24 being cranked outwardly to form a space for the reception of the plate between itself and a bearing member 26 carried by the piece 25 for one end of a roller 27 provided for the support of the lower run of the belt.

The arrangement of the peg and box member connection and of the guides on the longitudinal members of the frames provides support at each end of the plates at two points some little dis-

tance apart and produces longitudinal lateral stiffness. The outwardly sloping portion of the side plates not only adds to the strength of the plates but also results in the plates lying close to the side of the upper run of the belt but at a considerably greater distance from the side of the lower run. The upper run generally runs relatively straight, and the proximity of the plates to the sides of this run is desirable. The lower run of the belt, on the other hand, is more apt to sway or run out of line. In the conveyer described above, the lower portions of the plate being situated outside the box members, the edges of the lower run of the belt only contact with the rounded ends of the box members, and edge wear is thus reduced.

The overall height required to enable the conveyer to be erected is comparatively small, being approximately equal to that of the height of the conveyer when erected plus the distance which the pegs project into the box members. This feature is of importance when the conveyer is being fitted in a low-roofed mine gallery. A further feature of importance in fitting is the comparatively small heights of the individual parts into which the conveyer may be dismantled, since the height of the roller frames to the tops of the box members may be about the same as the height of the plates.

If desired the plates on opposite sides of the conveyer may be of different height, as is usual with face conveyers; but they can still be similar in all respects except the height to which they extend above the upper run of the belt.

I claim:—

1. A frame construction for a belt conveyer comprising in combination roller frames having sockets formed therein by the butting of the open ends of pairs of U-shaped members, side plates having the upper portion thereof located within the roller frames and the lower portion thereof located outside the roller frames, and pegs carried by said side plates, engaging in said sockets to locate said side plates relatively to said roller frames.

2. A frame construction for a belt conveyer comprising in combination roller frames, each of said roller frames comprising two U-shaped members, the abutting open edges of which form a socket and which are cut away to form a bearing for the upper roller of the conveyer, longitudinal members forming feet for said roller frames, brackets carried by said longitudinal members at each end thereof, side plates having the upper portion thereof located within the roller frames and the lower portion thereof located outside said roller frames, and rectangular pegs carried by said side plates, said side plates being located relatively to said roller frames by the engagement of said pegs in said sockets and the lower edge of said side plates being guided by said brackets.

3. A frame construction for a belt conveyer comprising in combination roller frames, side plates having the upper portion thereof located within the roller frames and the lower portion thereof located further apart and overlapping the roller frames outside the roller frames, and pegs carried by said side plates engaging sockets formed in said roller frames.

4. A frame construction for a belt conveyer comprising in combination roller frames having sockets formed therein, said sockets having ports in the sides thereof to allow of the egress of coal dust, side plates having the upper portion thereof

located within the roller frames and the lower portion thereof located further apart and overlapping the roller frames outside the roller frames, and pegs carried by said side plates engaging in said sockets.

5 5. A frame construction for a belt conveyer comprising in combination roller frames having sockets formed near the upper ends thereof and having longitudinally extending feet, side plates,
10 10 pegs carried by said side plates engaging in said sockets, and brackets mounted on the feet of said roller frames to guide the lower edges of said side plates and retain them in such a position that the lower end portions of said side plates
15 15 lie closely adjacent to the exterior surface of the said roller frames.

6. A frame construction for a belt conveyer comprising in combination roller frames at each side having sockets formed near the upper ends
20 20 thereof and having longitudinally extending feet, side plates crossing the planes of said roller frames, pegs carried by said side plates engag-

ing in said sockets, brackets mounted at each end of the feet of said roller frame to guide the lower edges of said side plates into position against the exterior surfaces of said roller frames, said brackets at one end of the feet of the roller frames being adapted to support the spindles of the bottom rollers of the belt conveyer.

7. A conveyer comprising in combination a belt, side plates having the upper portion thereof disposed so as to lie relatively close to the upper run of the belt and the lower portion thereof disposed so as to be spaced away from the lower run of the belt, frames carrying rollers supporting the belt, peg members carried by said side plates engaging sockets formed in said roller frames, and guide means for the lower edges of said side plates mounted on the feet of said roller frames, the parts being so arranged that the said upper portion and the said lower portion of the side plates have their ends overlapping the said frames upon opposite sides thereof.

TAGE GEORG NYBORG.