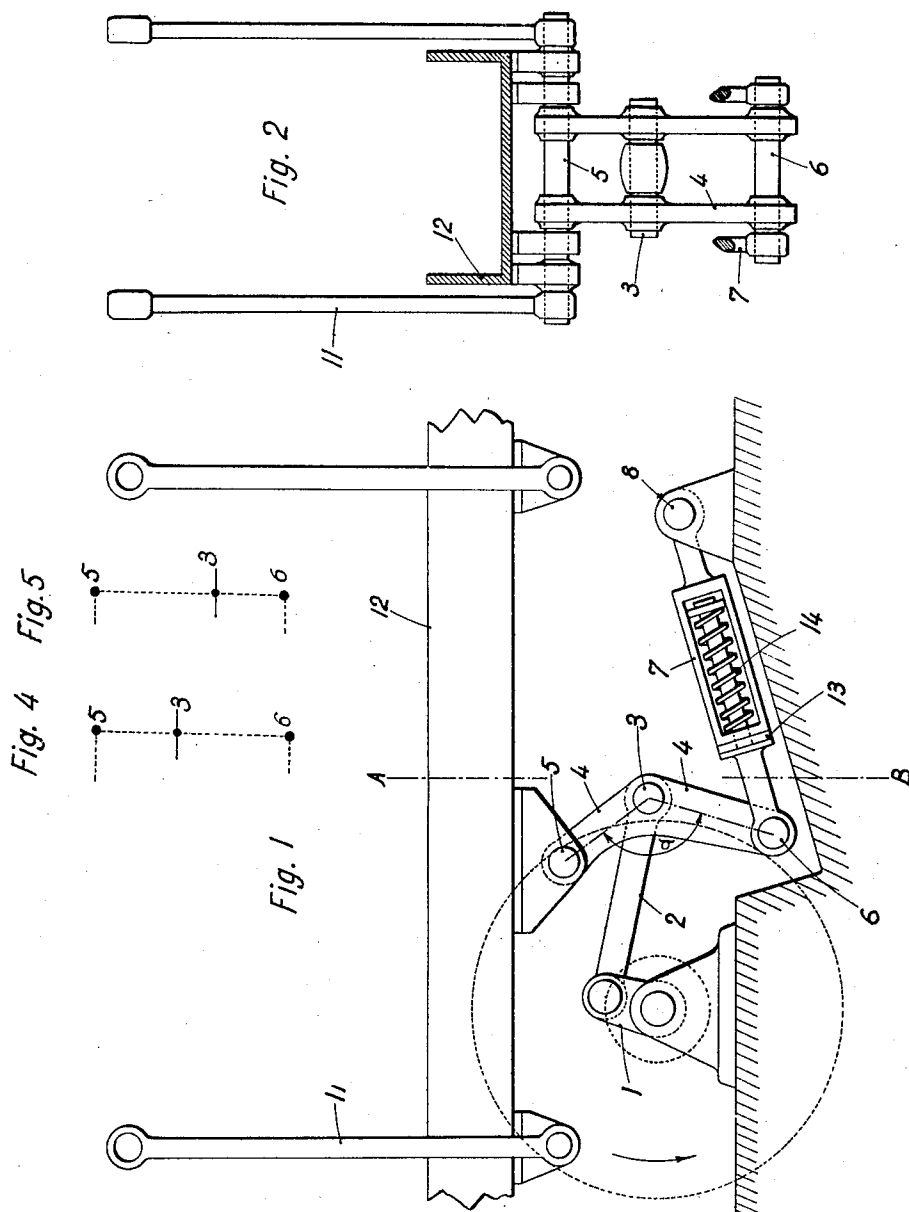


C. CANDLOT.
CONVEYER.
APPLICATION FILED JUNE 1, 1920.

1,386,158.

Patented Aug. 2, 1921.

2 SHEETS—SHEET 1.

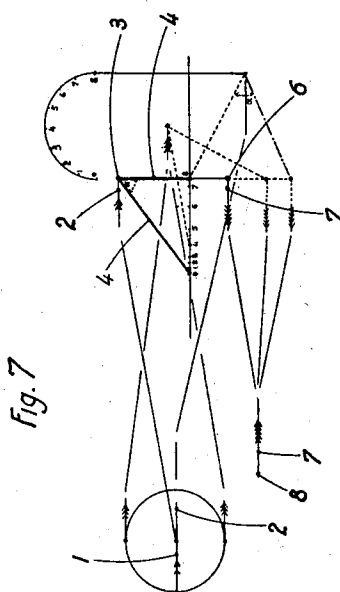
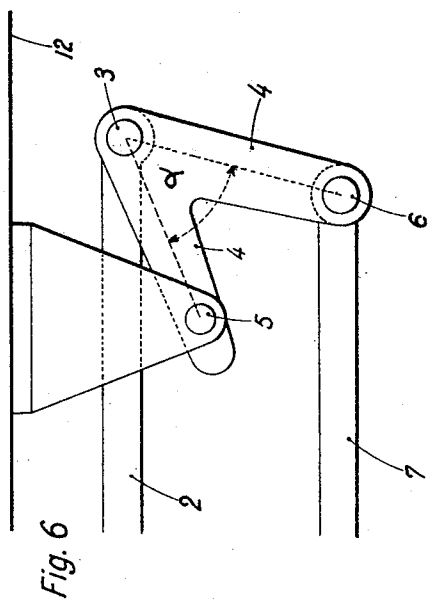
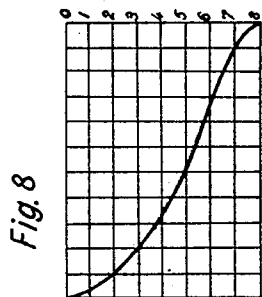
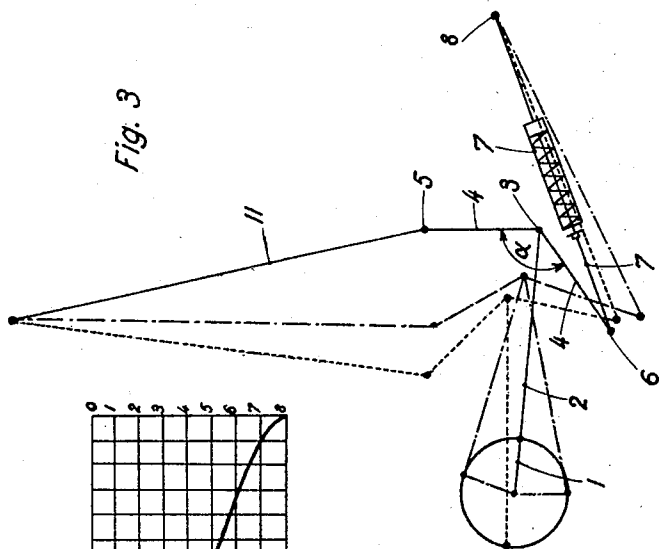


Inventor.

Charles Candlot
by *Chas. J. Hill*
att

1,386,158.

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2 SHEETS—SHEET 2.



Inventor.

Charles Candlot
by Chas. J. O'Hill
Att'y

UNITED STATES PATENT OFFICE.

CHARLES CANDLOT, OF PARIS, FRANCE.

CONVEYER.

1,386,158.

Specification of Letters Patent.

Patented Aug. 2, 1921.

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To all whom it may concern:

Be it known that I, CHARLES CANDLOT, citizen of the French Republic, residing at Paris, Department of the Seine, in France, have invented certain new and useful Improvements in Conveyers, for which I have filed applications in Great Britain and France, 25th February, 1918; Spain, 20th November, 1919; Belgium, 15th November, 1919; Switzerland, 23rd December, 1919; Germany, 10th January, 1920; Italy, 26th December, 1919; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present apparatus has for its object to impart to jiggling conveyers, which are supported on rollers or suspended from rods, an oscillating movement such that the material to be transported moves in a determined direction. Consequently the movement, slow at the beginning of the stroke ought to accelerate, then suddenly slacken, resume a rapid movement at the beginning of the backward stroke and diminish gradually in order to change slowly from the forward stroke to the backward or return stroke. The material is therefore submitted to the impulsion or jerk of the conveyer and slides in the desired direction, for a certain length at each movement.

Controlling systems heretofore extant transform a continuous circular movement into an alternating movement the law of which is determined so as to realize the displacement of the material under the conditions hereinbefore explained. The change is made by rods and cranks which latter oscillate about a fixed point. The controlling members are subjected to considerable stress when the direction of motion is suddenly changed from the forward to the backward stroke. The rods are subjected to important alternate forces and as they become displaced with very sudden or abrupt movements, they are badly adapted to act as resilient shock absorbers.

The apparatus according to the present invention has neither cranks oscillating about a fixed point, nor rods having abrupt movements. The controlling rod has relatively slow movements. The change of movement is effected by means of a bell crank lever pivotally connected at its center to the end

of a driving rod and directly attached by its upper part to the conveyer and by its lower part to a coupling which is resilient and extensible but noncompressible.

The invention is hereinafter described in detail with reference to the accompanying drawings, which show diagrammatically, by way of example, two constructions of the apparatus and some diagrams explanatory of the operation.

Figure 1 is a side elevation of a construction showing the controlling crank in the middle position.

Fig. 2 is a cross section on the line A, B Fig. 1.

Fig. 3 is a diagram of the movements of the mechanism, the main controlling rod and connections being shown in four different positions, viz. the forward and rear ends of the strokes and two intermediate positions.

Figs. 4 and 5 show the projections on vertical axes of the connections in the backward and forward strokes.

Fig. 6 shows a modified form of the apparatus wherein is employed an acute angled bell crank lever.

Fig. 7 is a diagram analogous to that of Fig. 3, but applicable to the construction shown in Fig. 6.

Fig. 8 shows the graph of the bell crank lever arms actuating the conveyer.

Referring to Figs. 1 and 2 of the drawings, the crank 1 rotates at a constant angular velocity and actuates a rod 2 which is pivoted at 3 to one arm of a bell crank lever 4. The angle α between the two arms of the bell crank lever is determined according to the condition hereinafter explained. The bell crank lever carries two pivot pins 5 and 6. The upper pivot pin 5 is connected directly to the conveyer 12 to which it imparts the desired movement. The lower pivot pin 6 connects the lower arm of the bell crank lever with the resilient coupling which is connected to a fixed oscillatory pivot 8. The coupling cannot be shortened but can be easily lengthened due to the interposition of the washers 13 and powerful springs 14.

The mechanism and the main controlling rod are shown in Figs. 3, 4 and 5 in four different positions, the forward end of the stroke, the rear end of the stroke and positions intermediate thereof.

It will at once be seen that the projections or intercepts on the vertical axes y , y' and

y^1, y^1 , of the points of connection of the bell crank lever arms to the pivots 5 and 6 disclose the following features; at the end of the backward stroke Fig. 4, the projected length or intercept of the upper arm of the bell crank lever is short while the projected length of the lower arm of the bell crank lever is long, the speed of the conveyer is then a minimum; at the end of the forward stroke Fig. 5, the projected length of the upper lever arm of the bell crank is long, while the projected length of the lower arm is short, and the speed of the conveyer is thus a maximum. The angle α is determined so that the change of these lengths is relatively abrupt toward the forward end of the stroke.

Near the forward dead point of the stroke, the bell crank tends to rotate, being influenced by a mass of the conveyer, all the more readily as the slight extension of the resilient coupling allows of this to a certain extent.

The play of the springs 14 permits the conveyer to continue its stroke to the end suddenly changing the direction of movement and considerably decreasing the forces on the pivot pins.

Contrary to certain previous arrangements where in the effort of the springs is of as much importance as the deformation or fatigue of the springs, the deformation or fatigue of the springs 14 of the present invention remains always very slight and consequently prolongs their utility and regularity of action.

The position and length of the rods as well as the angle α between the two arms of the bell crank lever are determined with the view of obtaining the best result. There is no previous assumption as to the respective lengths of the rods and crank which may bear any suitable relation to each other, with the sole view of obtaining the desired movement, but by practice the best dimensions can be determined which are most suitable to the apparatus.

The angle α in the foregoing description has been assumed as being obtuse. The principle remains the same when the angle α is acute. Fig. 6 shows the movement diagram in this case; to avoid taking into account the obliquity of the rods, it is assumed that these are of infinite length in the diagram Fig. 7. In practice their length is determined in such manner that the influence of the obliquity of the rods is negligible.

In Fig. 6, representing a modification of Fig. 1, the crank 1, rotates at constant angular speed. It actuates the rod 2 which is pivoted at 3 to the bell crank 4. The pivot 5 is directly secured to the conveyer to which it imparts the desired movement the pivotal connection 6 connecting the lower arm of the bell crank lever to the resilient

coupling 7 which is connected to a fixed pin 8.

In this construction, contrary to that which takes place when the angle α is obtuse, the coupling 7 is resilient in the direction of compression only and inextensible. This result is obtained in a manner analogous to the first construction.

The principle of increasing the speed by modifying the projection of the bell crank on axes perpendicular to the direction of the conveyer is retained, nevertheless the fact of having the pivot pin 5 below the pivot pin 3 at the rear end of the stroke permits, if desired of a stroke of the conveyer less than that of the crank whereas with an obtuse angle α the stroke of the conveyer is greater than that of the crank. The construction is analogous to that of Fig. 1. One or other of the arrangements may be employed as desired.

Claims:

1. An operating mechanism for shaking screens and the like, the combination with a connecting rod having at one end a crank connection with a continuously rotating driving means, of a floating bell crank lever pivotally secured at its intermediate portion to the other end of said connecting rod, a pivotal connection between one end of said bell crank lever and screen and a resilient coupling for supporting the other end of said bell crank lever.

2. An operating mechanism for shaking screens and the like, the combination with a connecting rod having at one end a crank connection with a continuously rotating driving means, of a floating bell crank lever pivotally secured at its intermediate portion to the other end of said connecting rod, a pivoted connection between the upper end of said bell crank lever and screen, and an extensible and contractible link having one end secured to a fixed pivot and its other end pivotally connected to the lower end of said bell crank lever.

3. An operating mechanism for shaking screens and the like, the combination with a connecting rod having at one end a crank connection with a continuously rotating driving means, of a floating bell crank lever pivotally secured at its intermediate portion to the other end of said connecting rod, a pivoted connection between the upper end of said bell crank lever and screen, and a spring-controlled, telescoping link having one end secured to a fixed pivot and its other end pivotally connected to the lower end of said bell crank lever.

In testimony whereof I affix my signature, in presence of two witnesses.

CHARLES CANDLOT.

Witnesses:

J. F. MCGURE,
EMILE KLOK.