No. 773,900. PATENTED NOV. 1, 1904.

O. SODER.

MECHANICAL MOVEMENT.

APPLICATION FILED JAN. 4, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

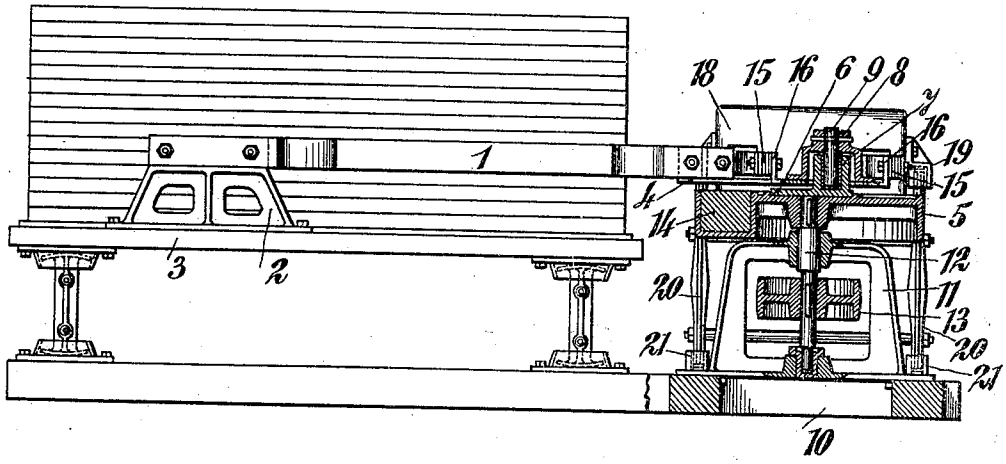
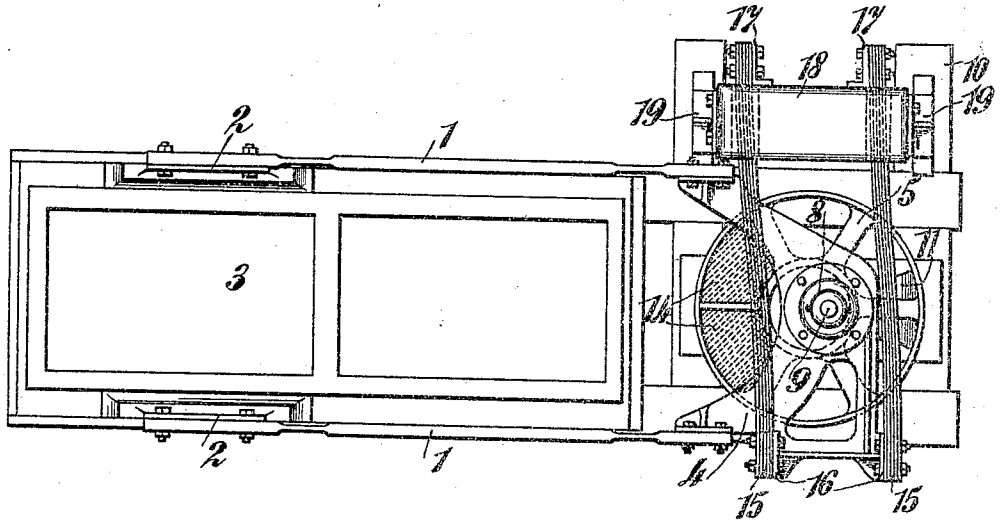


Fig. 2



Witnesses:

B. F. Oberlin

B. F. Sommers

Inventor:

Oscar Soder

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Attys.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

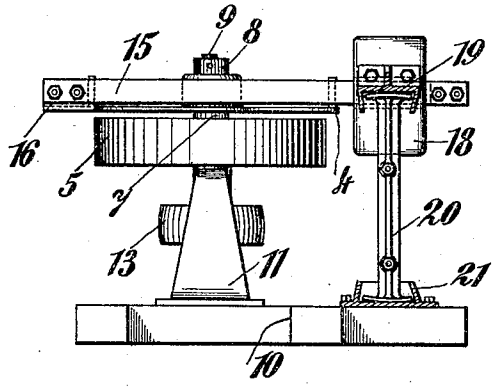
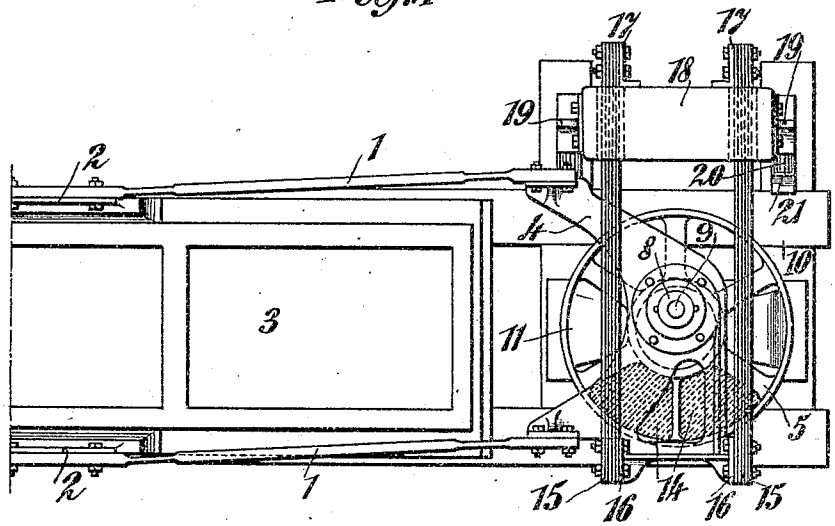


Fig. 4



Witnesses:

A. Tober

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No. 773,900. Patented November 1, 1904.

UNITED STATES PATENT OFFICE.

OSCAR SODER, OF NIEDERLENZ, SWITZERLAND, ASSIGNOR TO THE FIRM OF J. SODER & SÖHNE, OF NIEDERLENZ, SWITZERLAND.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 773,900, dated November 1, 1904.

Application filed January 4, 1904. Serial No. 187,688. (No model.)

To all whom it may concern:

Be it known that I, OSCAR SODER, a citizen of the Republic of Switzerland, residing at Niederlenz, Switzerland, have invented a new and useful Mechanical Movement, of which the following is a specification.

My invention has relation to a mechanical movement particularly designed to convert rotary motion into rectilinear motion, and specifically to convert rotary motion into reciprocating motion; and it has for its object the provision of means for balancing the shocks resulting from the thrust and pull on the device to which rectilinear motion is imparted through its connections with the rotating element, whereby not only a substantially noiseless but a uniform motion is imparted to the actuated device and those shocks which act injuriously not only on the actuated device but on the actuating mechanism are avoided; but that my invention may be fully understood I will describe the same in detail, reference being had to the accompanying drawings, in which, as an example, I have shown my invention as applied to a screening or sifting machine for the purpose of imparting rectilinear reciprocating motion thereto.

In said drawings, Figure 1 is a side elevation, partly in section; and Fig. 2, a top plan view. Fig. 3 is a side elevation, partly in section, of the mechanical movement; and Fig. 4 is a fragmentary top plan view showing the actuating mechanism in a position different from that shown in Fig. 2.

On the vertical crank-shaft 12, which is mounted in a standard 11, erected on the bedplate 10, are fixed a belt-pulley 13 and a fly-wheel 5. On the upper side of this fly-wheel 5 is fixed an inset piece 6, Fig. 1, which is provided with a projecting part 7, arranged eccentrically to the axis of the shaft and formed with a bushed hole. In this hole is loosely inserted a crank-pin 9, which is fixed to a plate 4 by means of a dome 8. To the plate 4 are rigidly connected the similar ends of two springs 1 1, of elongated form, their other ends being connected rigidly by means of intermediate pieces 2 to the sifter 3, which is adapted to be moved to and fro rectilinearly. The fly-wheel 5 is provided with a weight 14, arranged diametrically opposite to the crank-pin and intended to balance the stresses which occur at each end of the stroke of the reciprocating sifter at the moment of the reversal of the direction of movement of the same. Above the plate 4 are arranged two springs 15, each composed of several bars or strips arranged side by side on their longitudinal edges at right angles to the springs 1. The springs 15 are connected at one end to lugs 16 of the plate 4, and at their other end to lugs 17 of a weight 18, which is capable of moving rectilinearly transversely to the longitudinal direction of the springs 1. The weight 18 is of elongated prismatic shape and is provided on its ends with shoes 19, Fig. 3, by means of which the weight bears on uprights 20, whose feet rest in ways 21, provided on the bedplate 10.

The crank-driving mechanism operates in the following manner: By the rotation of the crank-shaft 12 the sifter 3 is moved rectilinearly to and fro by means of the crank-pin 9 through the medium of the springs 1, while through the medium of the springs 15 the weight 18 is moved rectilinearly to and fro in a direction at right angles to the direction of movement of the sifter, and the weight 14 is caused to rotate around the axis of the shaft. This weight 14 by reason of its position relatively to the crank-pin 9 will be in its extreme left-hand position when the sifter 3 is in its extreme right-hand position, and, vice versa, it will be in its extreme right-hand position when the sifter is in its extreme left-hand position. Consequently the stresses which occur at each end of the stroke of the sifter are balanced. The weight 18, which can move rectilinearly to and fro, reaches its extreme end positions when the weight 14 is in positions situated ninety degrees from its extreme right-hand and left-hand positions. The weights 14 and 18 then act oppositely to each other, so that shocks or stresses which occur in the direction of the movement of the weight 18 will also be balanced. By the rotation of the crank-shaft the springs 1 and the springs 15 are bent alternately out of their middle po-

sitions (in which they are of straight form) in a lateral direction, Figs. 2 and 4, the one set of springs being always moved out of their middle positions to the same extent that the other set of springs are moved nearer to their middle positions. The employment of the springs 1 and 15 is intended to insure a gentle and steady motion during the entire duration of the rotation of the crank-shaft.

The weight 18 may be divided up into a number of smaller weights.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

1. Means to produce reciprocating motion, comprising a revoluble crank, a connection between the latter and the element to be reciprocated, and a weight to balance the thrusts of the crank; in combination with a second weight to balance the thrusts of the first-named weight, said second weight reciprocated by the crank in a direction practically at right angles to the direction of motion of the reciprocated element.

2. Means to produce reciprocating motion, comprising a revoluble crank, a connection between the latter and the element to be reciprocated and a weight to balance the thrusts of the crank; in combination with a second weight to balance the thrusts of the first-named weight, said second weight reciprocated by the crank in a direction practically at right angles to the direction of motion of the reciprocated element and a resilient or flexible connection between the second weight and crank.

3. The combination with an element to be reciprocated, a revoluble crank, a flexible connection between the crank and said element and a weight to balance the thrust of the crank; of a second weight, a flexible connection between it and the crank, said second weight reciprocated by the crank in a direction practically at right angles to the direction of motion of the reciprocated element.

4. Two pairs of bar-like springs, a revoluble crank to which one end of each of said pairs of springs is secured in planes practically at right angles to each other, the springs of each pair on opposite sides of the axis of rotation of the crank, a rocking weight connected to the free end of one pair of said springs and a second weight to balance the thrusts of the crank, for the purpose set forth.

5. The combination with the element to be reciprocated, of a crank to reciprocate the element, a rotating weight moving diametrically opposite to the crank, and a weight reciprocated by the crank at right angles to the direction of motion of the element, substantially as set forth.

6. The combination with the element to be reciprocated, of a crank, a plate moved by the crank, flat springs connecting the element to the plate, a weight moving diametrically opposite to the crank, a second weight rocked at right angles to the element and flat springs to connect the weight and plate, substantially as set forth.

7. The combination with the element to be reciprocated, of a crank and crank-shaft, a fly-wheel on the shaft eccentrically weighted, a plate moved by the crank, leaf-springs connecting the element to the plate, a weight moved at right angles to the direction of motion of the element and leaf-springs connecting the weight and plate, substantially as set forth.

8. The combination with the element to be reciprocated, of a crank and crank-shaft, a revolving weight to neutralize the thrusts at each end of the movement of the element and a second weight to neutralize the thrust on the connected parts when the first weight is rotating between its effective positions of neutralization on the element, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OSCAR SODER.

Witnesses:
E. BLUM,
A. LIEBERKNECHT.