

No. 627,706.

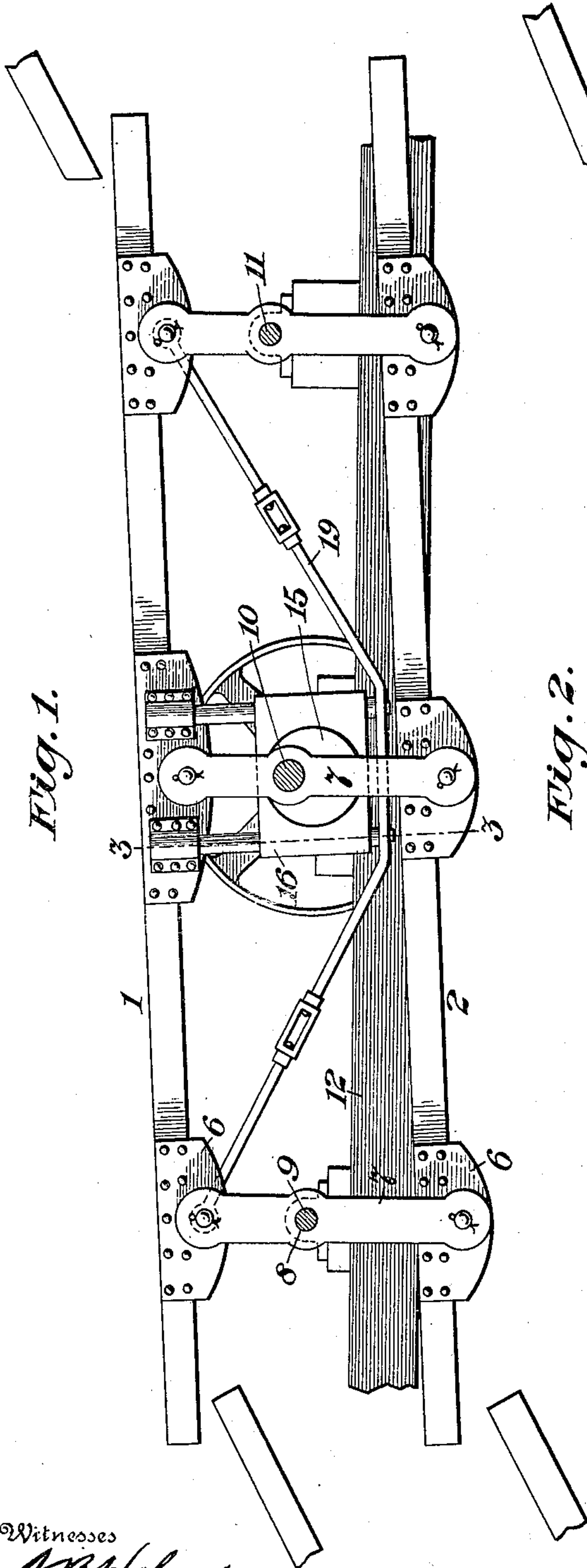
Patented June 27, 1899.

D. E. PHILLIPS.
SCREENING APPARATUS.

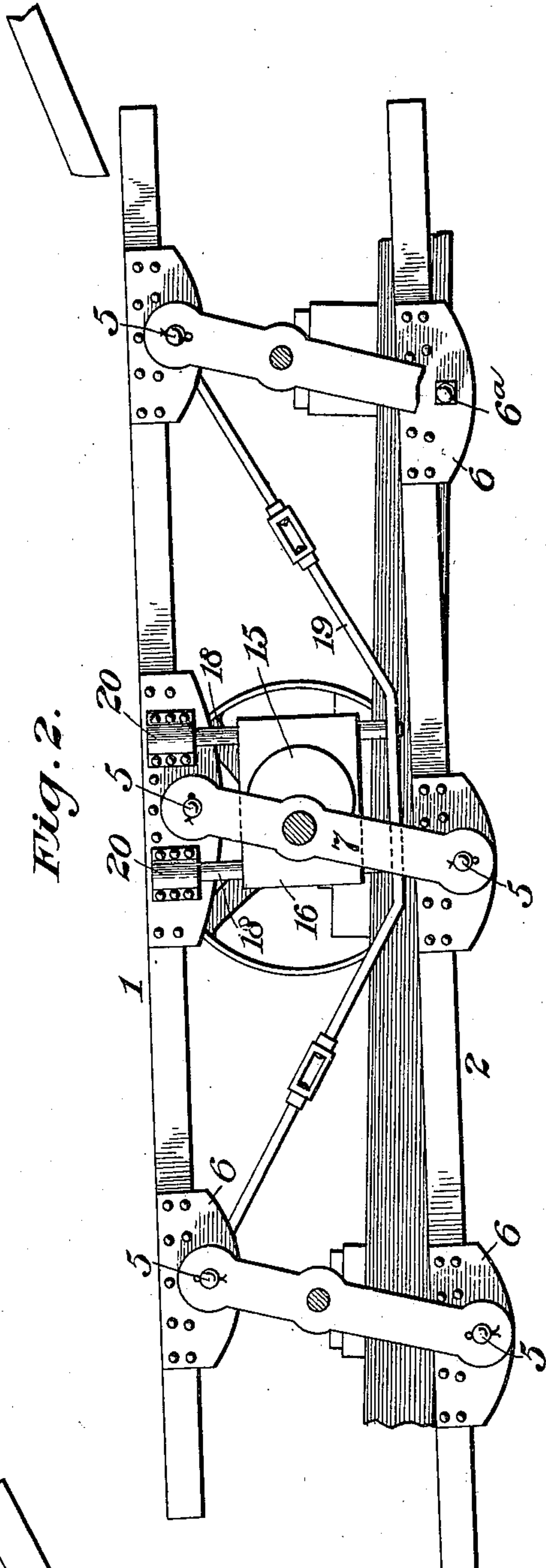
(Application filed Feb. 20, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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2 Sheets—Sheet 2.

Fig. 3.

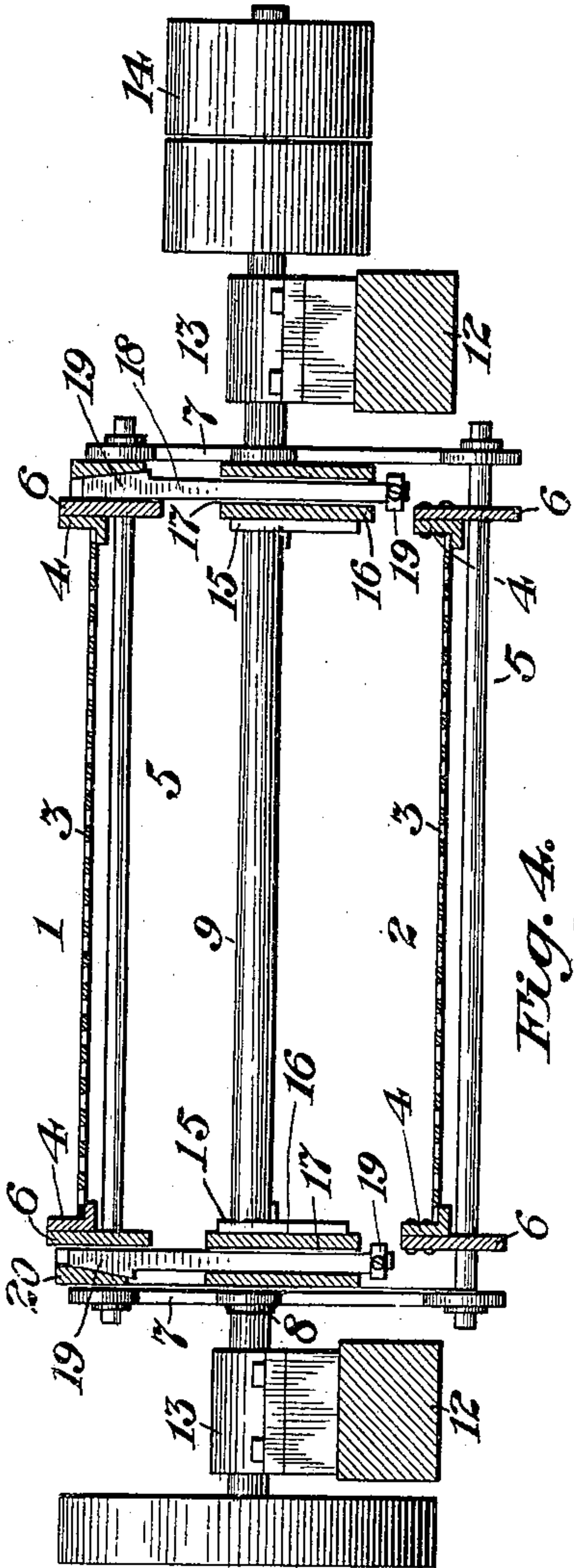
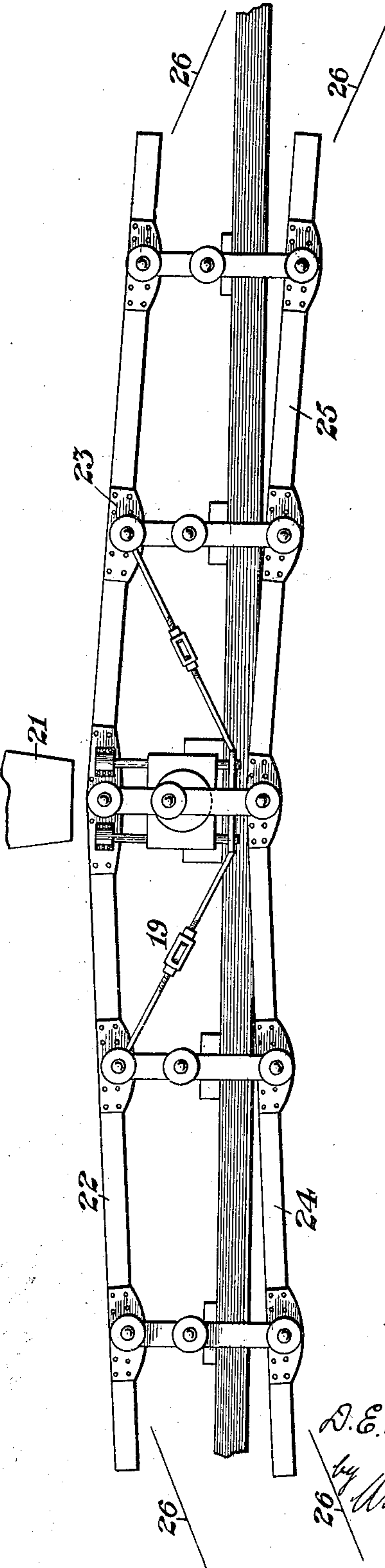


Fig. 4.



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UNITED STATES PATENT OFFICE.

DAVID E. PHILLIPS, OF MAHANOEY CITY, PENNSYLVANIA.

SCREENING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 627,706, dated June 27, 1899.

Application filed February 20, 1899. Serial No. 706,169. (No model.)

To all whom it may concern:

Be it known that I, DAVID E. PHILLIPS, a citizen of the United States, residing at Mahanoy City, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Screening Apparatus, of which the following is a specification.

The objects of my invention are to provide a simple and substantially constructed screening apparatus in which the longitudinal thrusts of the upper and lower screens are balanced against each other in such a way as to avoid transmitting vibrations to the frame-work of the building in which it is situated and which is also arranged to deliver the prepared coal or other material at its opposite ends.

In the accompanying drawings, which illustrate my invention, Figures 1 and 2 are side views of my improved screening apparatus in its simplest form, illustrating the operation of the same, one of the supporting-timbers and the bearings being removed. Fig. 3 is a transverse section on the line 3-3 of Fig. 1, and Fig. 4 is a side view of the apparatus arranged to deliver the screened material at both ends.

Referring to Figs. 1, 2, and 3 of the drawings, 1 and 2 indicate upper and lower screens, each, as shown, consisting of a perforated plate 3, supported along its sides by angle-irons 4, which form the sides of the screen. The perforated plate may be flanged on the sides and bolted to the angle-iron through these flanged sides instead of through the bottom, as shown in the drawings. Each screen is supported upon rods 5, which extend transversely beneath the screen at convenient intervals, these rods extending through suitable depending plates or brackets 6, attached to the opposite sides of the screen. The rods 5 are preferably made square or otherwise angular in cross-section throughout the major portion of their length, and the openings 6 in the depending brackets are of corresponding shape, as shown in the lower part of Fig. 2, so that the rods are prevented from turning. The ends of the rods projecting

beyond the sides of the screen are turned to form bearings, upon which are pivotally mounted a series of supporting-links 7, having suitable openings near their ends, adapted to pass over said bearings. The screens are thus connected together by the supporting-links, the corresponding rods of each screen being connected by a pair of links. The number of pairs of links employed will of course depend upon the length of the screens. Each link is provided with a central bearing 8, and each pair of links is mounted upon a separate shaft extending transversely between the screens and through said bearings. As shown in Figs. 1 and 2, there are three such shafts 9, 10, and 11, arranged at successively-increasing heights above the horizontal beams 12, upon which the shaft ends are supported, thus giving a proper inclination to the screens. The central shaft 10 is the driving-shaft, and it is mounted in suitable bearings 13 and provided with a driving-wheel 14. The shafts 9 and 10 may be either stationary or they may be mounted in bearings, so as to rock with the links, if it is desired to secure the links to said shafts, and instead of mounting the central links upon the driving-shaft I may journal them upon stationary sleeves connected with the bearings 13, so as to avoid wear by the shaft.

A pair of cams or eccentrics 15 are keyed or otherwise suitably secured to the driving-shaft just inside or, if desired, outside of the links 7, these cams being similarly arranged with reference to the shaft, and surrounding each of these eccentrics is a guide-block 16, having a circular opening adapted to receive the eccentric. Each guide-block is provided at either side of the circular opening with parallel guideways 17, Fig. 3, extending through the block and adapted to receive a pair of standards 18, which are secured to the upper screen in any suitable manner. As shown in the drawings, the standards are each formed with a wedge-shaped upper end 19, adapted to fit within a tapering opening in a lug 20, secured to the side of the screen. Each pair of standards is rigidly held against longitudinal movement by a brace 19, suspended

from the rods 5 of the upper screen on either side of the standards and having its central portion connected with the free ends of the standards projecting through the guideways.

5 The operation of the apparatus will be readily comprehended from an inspection of Figs. 1 and 2, which represent the screen in different positions. When the driving-shaft is turned, the revolution of the eccentrics will
10 carry the guide-blocks alternately from right to left, and the latter through the medium of the standards will rock the upper screen in a corresponding manner, while the lower screen will be simultaneously moved in the
15 opposite direction through the medium of the links, as indicated in Fig. 2. In passing between the extreme right and left hand positions the cam-block will move vertically upon the standards and there will be a slight vertical movement of the latter as the screens
20 rock upon the shafts. The change in the direction of movement of the screens is accomplished gradually by the cams, and it will be noted that the strains upon the driving-shaft
25 in a direction parallel with the screens, due to the inertia of the screens to be overcome in stopping or starting, are always equal and opposite in direction to the strains from the same cause on the shafts 9 and 11 combined.
30 The shafts being all mounted upon continuous beams, the opposing strains are neutralized therein and no deleterious vibration results.

In Fig. 4 I have shown an arrangement in which the screening and delivering capacity
35 of the apparatus is doubled and in which the balancing of the apparatus is perfectly maintained. In this instance the screens are of double length and inclined in opposite directions from the central point. The chute
40 21, which delivers the coal to the apparatus, is located over the central point of the upper screen, so that the unprepared coal is delivered equally on each half 22 and 23 of said screen, the finer material dropping through
45 onto the corresponding halves 24 and 25 of the lower screen. Chutes 26 are arranged at the opposite ends of each screen for conveying the prepared coal to the cars or coal-bin. The general construction and operation are
50 the same as in Figs. 1, 2, and 3. This double arrangement of the screens may be used to advantage in many instances and is a valuable feature of my invention. When the sides 22 and 25 are traveling in a direction opposed
55 to the descending coal, the sides 23 and 24 are traveling with the coal on said screens, and vice versa, and the balance of the apparatus is maintained.

While I have shown the driving apparatus
60 connected by means of the standards and guide-blocks with the upper screen, it will be understood that the standards may be connected with the lower screen instead, also that the driving-shaft may be located elsewhere
65 than in the central part of the apparatus, and

that other changes may be made in the arrangement of the apparatus without departing from the spirit and scope of my invention.

Having described my invention, what I claim, and desire to secure by Letters Patent 70 of the United States, is—

1. The combination with upper and lower screens, and supporting-links fulcrumed between and pivotally connected with said
75 screens, of a driving-shaft provided with a cam, a guide-block operated by said cam, and having a guideway, and a standard secured to one of said screens, and extending into said guideway, substantially as described.

2. The combination with upper and lower
80 screens, and supporting-links fulcrumed between and pivotally connected with said screens, of a driving-shaft provided with a cam, a guide-block operated by said cam, and having guideways on either side of the shaft,
85 and a pair of standards secured to one of said screens, and extending into said guideways, substantially as described.

3. The combination with upper and lower
90 screens, and supporting-links fulcrumed between and pivotally connected with said screens, of a driving-shaft, provided with a cam, a guide-block operated by said cam and having guideways, standards secured to one of said screens, and extending through the
95 guideways, and a brace-rod connected to said screen on either side of the standards, and engaging their free ends substantially as described.

4. The combination with upper and lower
100 screens, and supporting-links fulcrumed between and pivotally connected with said screens, of a driving-shaft, extending between and transversely of said screens, a pair of cams on said shaft, guide-blocks operated by
105 said cams, and having guideways, and standards secured on either side of one of said screens and extending into said guideways, substantially as described.

5. The combination with upper and lower
110 screens and supporting-links fulcrumed between and pivotally connected with said screens, of a driving-shaft arranged transversely between the screens and midway of their length, said shaft forming a support for
115 the central pair of links, and means operated from said shaft for reciprocating the screens, substantially as described.

6. The combination with upper and lower
120 screens, each having its ends oppositely inclined from the central point, and supporting-links fulcrumed between and pivotally connected with said screens, of a driving-shaft extending between and transversely of said screens, cams on said shafts, guide-
125 blocks operated by said cams and having guideways, and standards secured to one of said screens and extending into said guideways.

7. The combination with upper and lower 130

5 screens, supporting-links fulcrumed between and pivotally connected with said screens, parallel continuous beams and shafts arranged transversely thereof upon which said links are fulcrumed, a driving-shaft supported upon said beams, said shaft being provided with a cam, a guide-block provided with guideways upon said cam, and stand-

ards secured to one of said screens and extending into said guideways.

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

DAVID E. PHILLIPS.

Witnesses:

JNO. W. PHILLIPS,
FRANK F. REED.