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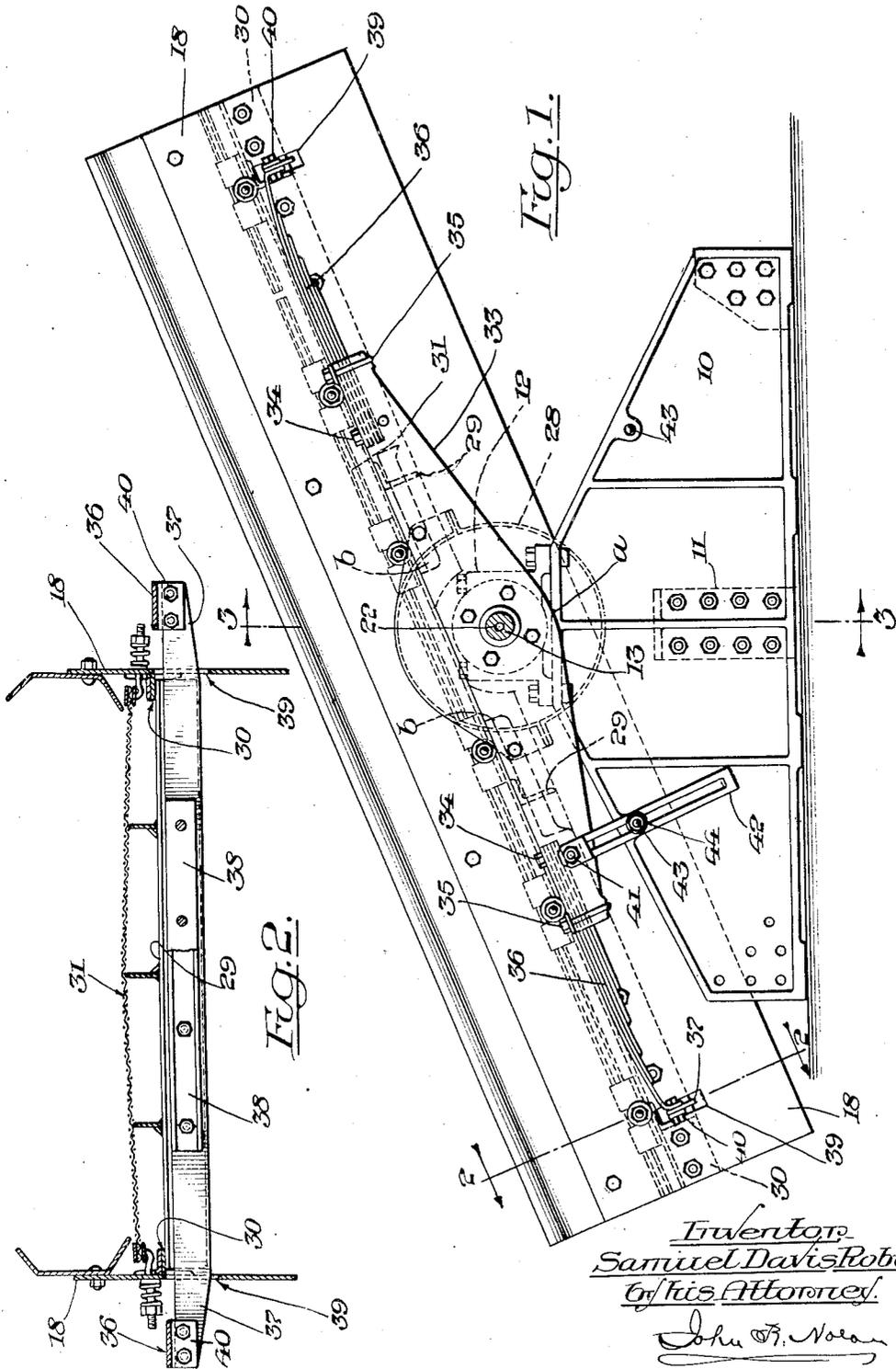
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1,923,229

SCREENING APPARATUS

Filed March 7, 1931

4 Sheets-Sheet 1



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Aug. 22, 1933.

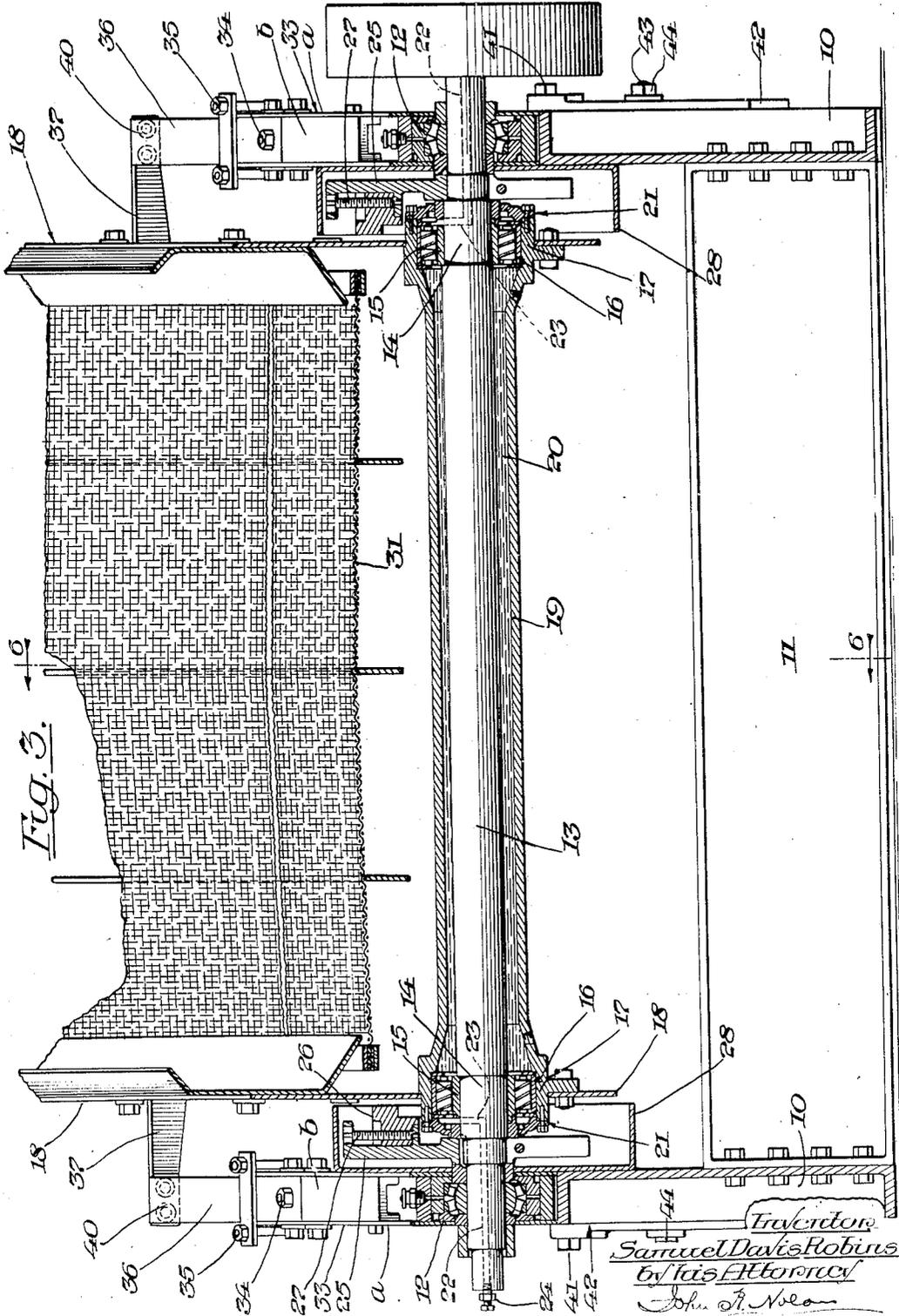
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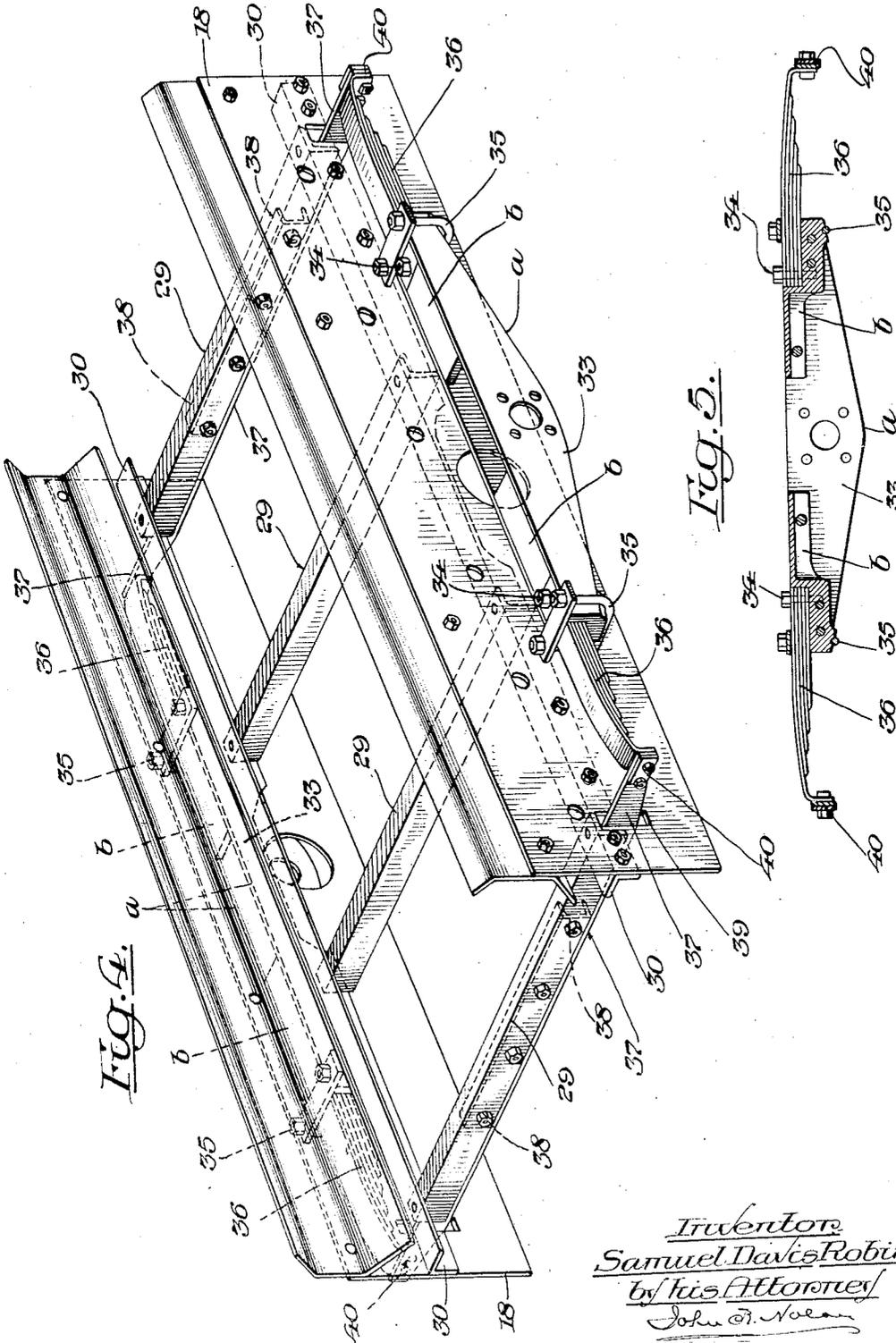


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4 Sheets-Sheet 3



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4 Sheets-Sheet 4

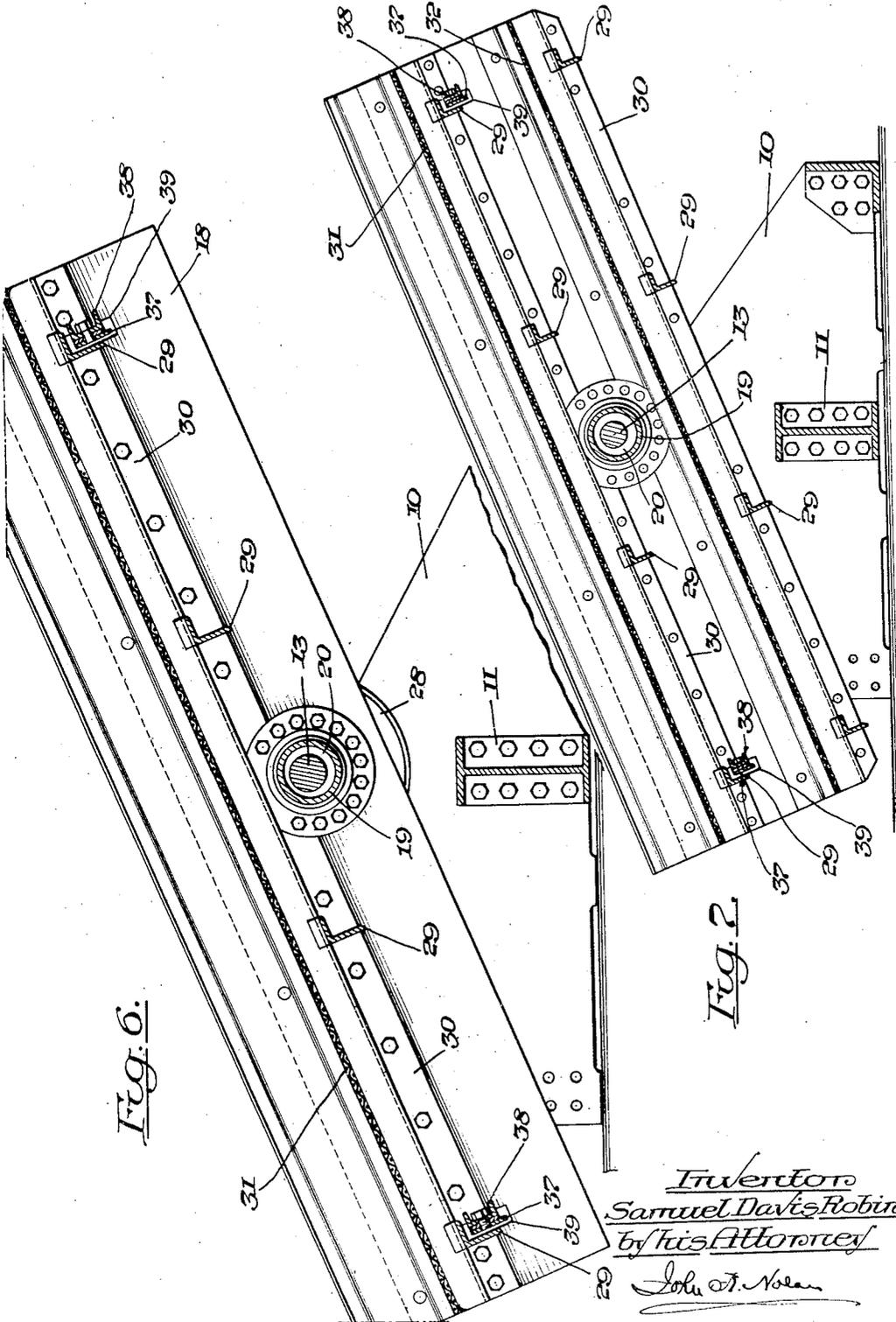


Fig. 6.

Fig. 7.

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UNITED STATES PATENT OFFICE

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SCREENING APPARATUS

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Application March 7, 1931. Serial No. 520,842

7 Claims. (Cl. 209—326)

This invention relates to vibratory screens of the kind wherein a screening element is supported at its midsection by actuating means effective to gyrate the element in orbits lying in planes at right angles to the plane of the screen surface; wherein resilient stabilizing means is mounted and arranged to maintain the said element in correct screening position while permitting its positive gyration, and wherein counterweights carried by the actuating means are mounted and arranged to compensate for the unbalanced load of the screening element, thus preventing escaping vibrations. A screen having the characteristics mentioned is disclosed in Letters Patent of the United States No. 1,693,940, dated December 4, 1928.

In the particular construction illustrated in the said patent the screening element embodies a live frame having two screen decks; the actuating means includes a power-driven shaft which is journaled in stationary bearings and carries eccentrics operatively connected with the live frame, and the resilient stabilizing means comprises suitably-supported leaf springs which extend longitudinally of the live frame and are jointed thereto by link connections, as will more fully appear by reference to said patent.

The principal object of the present invention is to provide between the extremities of the leaf springs and the live frame resilient connections arranged and adapted to permit the flexure of said springs and accommodate the gyratory travel of the frame.

A further object of the invention is to provide resilient connections that extend transversely of the live frame and couple the corresponding extremities of the leaf springs in such manner as to maintain the live frame in central position and thereby relieve the bearings from side thrust.

With these and other objects in view my invention comprises features of novelty, a preferred form of which will be hereinafter described; the scope of the invention being expressed in the appended claims.

In the drawings—

Figure 1 is a side elevation of a single deck screen embodying my invention.

Fig. 2 is a transverse section of the structure, as on the line 2—2 of Fig. 1.

Fig. 3 is a similar section, as on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of the live frame, the stabilizing springs and their resilient end connections; the screen cloth being omitted.

Fig. 5 is a longitudinal section of an adjustable supporting beam for the stabilizing springs at one side of the live frame, said springs and the resilient end connections therefor being shown.

Fig. 6 is a longitudinal section of the screen, as on the line 6—6 of Fig. 3.

Fig. 7 is a similar section showing the invention as embodied in a double deck screen.

Referring to the drawings, 10 designates two spaced uprights connected by cross-braces 11 and forming a substantial base frame. The upright support bearings 12 preferably of the self-aligning roller type for the journals of a shaft 13 adapted to be driven from a suitable source of power.

The shaft has formed thereon, adjacent the respective uprights, eccentric portions 14 each of which in the present instance is seated in the inner race 15 of a roller (or ball) bearing, whereof the outer race 16 is fixedly held in a cylindrical housing 17 bolted or otherwise secured to the adjacent side plate 18 of the live frame. The housings 17 for the respective eccentric bearings are preferably formed by the expanded extremities of a tubular casing 19 which surrounds the body of the shaft 13 between the side plates and affords an elongated chamber 20 for lubricant for the eccentric bearings. The outer ends of the housings 17 have bolted thereto suitable caps 21 to exclude dust, grit, etc., from the bearings. The lubricant is conveniently supplied to the eccentric bearings and the chamber 20 through longitudinal ducts 22 bored in the respective ends of the shaft and leading by radial ports 23 to the housings 17. The outer ends of the ducts are provided with suitable plugs or fittings 24.

The shaft 13 has adjustably clamped thereto at its respective ends sectors 25 carrying counterweights 26 which, when the sectors have been properly applied, may be adjusted radially to compensate for the unbalanced load of the live frame, thus preventing escaping vibrations. In the present instance the counterweights 26 are slidably fitted in the respective sectors 25 and are bored and tapped to receive radial adjusting screws 27 which are rotatably mounted at their ends in the sectors. Guard casings 28 for the counterweight supports are secured to the respective uprights 10 of the base frame.

The side plates 18 of the live frame are connected and rigidly held in spaced parallel relation by means of cross-bars 29 which are bolted at their ends to longitudinal angle bars 30 on the inner side of the respective plates. Screen cloth 31 is supported and maintained under tension above the angle bars 30 in any usual or approved manner. In the case of a double deck screen the lower portions of the side plates 18 are extended to receive and support a lower screen deck 32 as shown in Fig. 7.

Adjacent the exterior of the respective side plates of the live frame are pivotally mounted beams 33 comprising preferably two side members *a* and recessed spacer blocks *b* at the ends thereof, which beams straddle the adjacent bearings 12 for the shaft. To the spacer blocks of

each beam are secured, as by bolts 34 and clips 35, corresponding leaf springs 36 which extend longitudinally of the adjacent frame plate 18 and toward the respective ends of the latter. Hence there are two pairs of springs 36, one pair at each side of the live frame.

Extending transversely of the live frame, adjacent its respective ends, are two spring strips 37 which are secured flatwise by elongated clamp bars 38, or other suitable means, to the midsections of the respective end cross-bars 29 of the live frame. The ends of the strips project outwardly through suitably-disposed openings 39 in the frame plates and are secured to the adjacent extremities of the longitudinally disposed springs 36 which are carried by the beams 33. In the present instance such extremities are bent downward and bolted, as at 40, to the flat vertically disposed faces of the projecting end portions of the spring strips 37, which end portions by virtue of their inherent elasticity are free to deflect in paths longitudinally of the screen frame and the stabilizing springs, yet through their rigidity in planes at right angles to such paths serve to transmit the pressure of the stabilizing springs directly to the frame.

Since the beams 33 and the springs 36 which extend therefrom are coupled together and to the live frame through the transverse spring strips 37 it follows that when either of the beams is swung on the shaft 13 as an axis, the whole assembly including the live frame, is moved as a unit, thus effecting any desired angular adjustment of the frame without changing the relative positions of the spring connections.

Pivoted, as at 41, to an arm of one of the spring-supporting beams 33 is a longitudinally slotted depending bar 42, by the vertical movement of which the beam can be positioned to effect any desired angular adjustment of the live frame. A bolt 43 extending from the adjacent upright 10 of the live frame passes through the slot of the bar and is provided with a clamp nut 44 by means of which the bar 42, and perforce the live frame, can be locked in any desired position of adjustment.

From the foregoing it will be seen that during the positive gyration of the live frame through its eccentric mounting on the actuating shaft the springs 36 constitute stabilizing means which maintain the frame in correct screening position, and that the free flexure of said springs to accommodate the gyratory travel of the frame is ensured by their resilient connection with the frame through the transverse spring strips 37.

It will also be seen that said strips 37 by virtue of their connection with the live frame and with the stabilizing springs 36 are effective to maintain the live frame in central position between the respective bearings, thus relieving the bearings from side thrust.

It is to be understood that my invention is not limited to the specific details of construction herein disclosed, as the structure may be modified within the principle of the invention and the scope of the appended claims.

I claim—

1. A screen of the character described comprising a screening frame, means including a shaft and connections for gyrating said frame in vertical orbits, stationary bearings for said shaft, stabilizing leaf springs and means connecting the extremities of said springs and screening frame comprising members which are rigid along

the line of action of the ends of said springs yet are inherently resilient at right angles thereto along the leaves of the springs.

2. A screen of the character described comprising a screening frame, means including a shaft and connections for gyrating said frame in vertical orbits, stationary bearings for said shaft, stabilizing leaf springs extending longitudinally of the frame toward the respective ends of the frame, and spring strips arranged transversely of and attached to said frame, the ends of said strips being secured to the extremities of the stabilizing springs.

3. A screen of the character described comprising a screening frame including longitudinal side plates having openings therein adjacent the respective ends of the plates, means including a shaft and connections for gyrating said frame in vertical orbits, stationary bearings for said shaft, stabilizing leaf springs arranged longitudinally of the side plates and extending adjacent the respective openings, and transversely disposed spring strips attached to said frame and having their ends extended through said openings and secured to the extremities of the stabilizing springs.

4. A screen of the character described comprising a screening frame, means including a shaft and connections for gyrating said frame in vertical orbits, stationary bearings for said shaft, supporting beams adjacent the respective sides of the frame, stabilizing leaf springs extending from said beams toward the respective ends of the frame, and connecting means between the extremities of said springs and the screening frame comprising members which are rigid along the line of action of the ends of said springs yet are inherently resilient at right angles thereto along the leaves of the springs.

5. A screen of the character described comprising a screening frame, means including a shaft and connections for gyrating said frame in vertical orbits, stationary bearings for said shaft, angularly adjustable beams adjacent the sides of said frame, means for securing said beams in positions of adjustment, stabilizing leaf springs extending from said beams toward the respective ends of the frame, and connecting means between the extremities of said springs and the screening frame comprising members which are rigid along the line of action of the ends of said springs yet are inherently resilient at right angles thereto along the leaves of the springs.

6. In a screen of the character described, including a screen frame, means for positively gyrating said frame in vertical orbits, and laterally disposed stabilizing springs extending longitudinally of said frame, spring strips extending transversely of and affixed to said frame in such manner that the free ends of the strips are yieldable longitudinally of the frame, said ends being fastened to the adjacent extremities of the respective stabilizing springs.

7. In a screen of the character described, including a screen frame, means for positively gyrating said frame in vertical orbits, and laterally disposed stabilizing springs extending longitudinally of said frame, spring strips extending transversely of said frame, elongated clamp bars fixedly securing the mid-portions of said strips to the screen frame in such manner that the free ends of the strips are yieldable longitudinally of the frame, said ends being fastened to the adjacent extremities of the respective stabilizing springs.

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