W. L. & F. S. CARD.

CONCENTRATOR TABLE SUPPORT.

APPLICATION FILED SEPT. 24, 1908.

917,247.

Patented Apr. 6, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

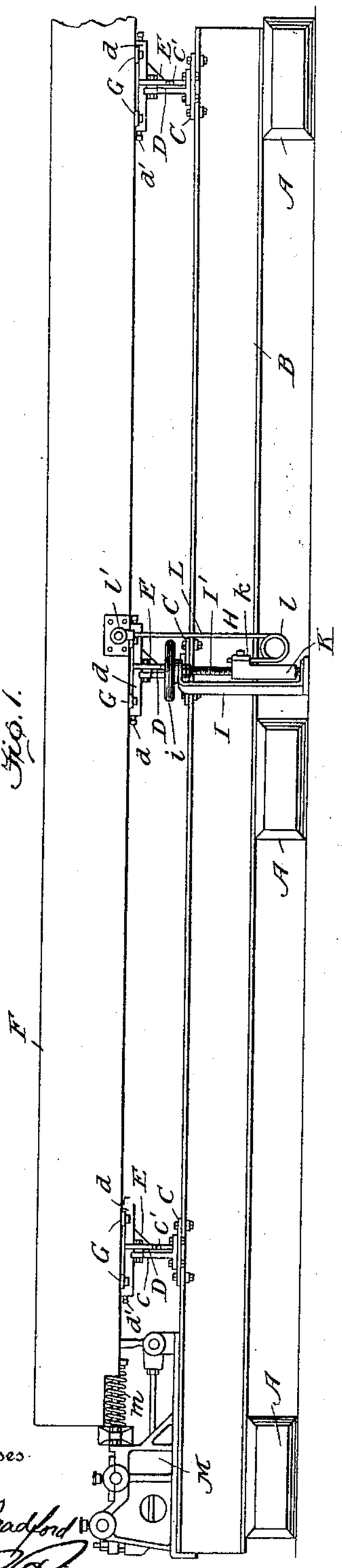
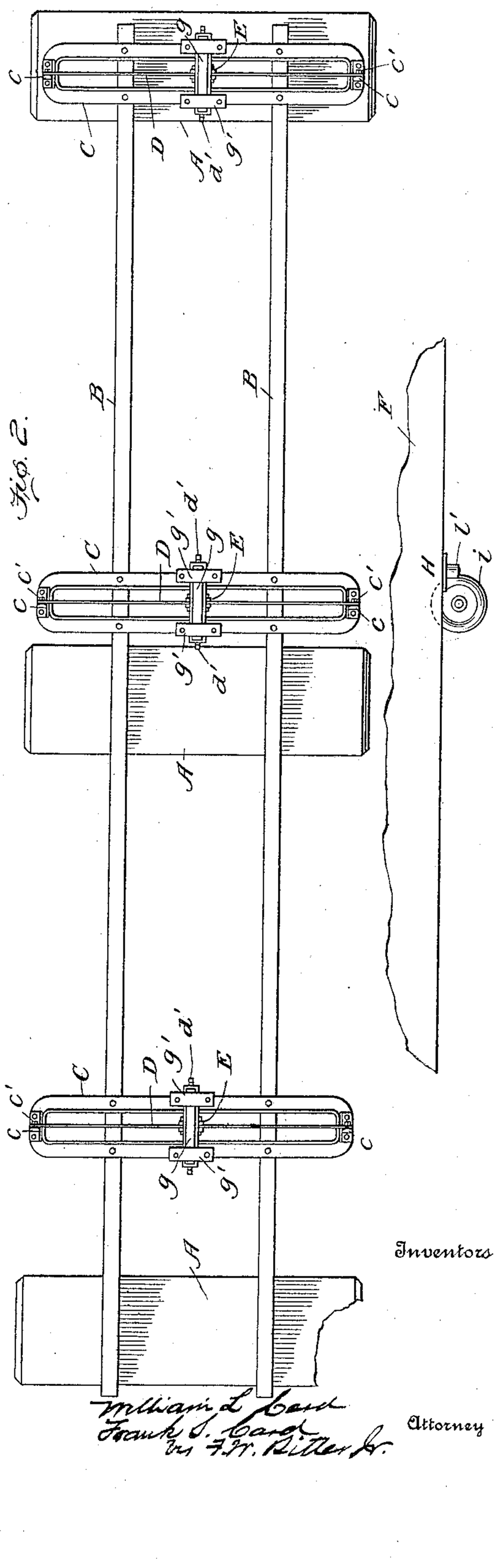


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

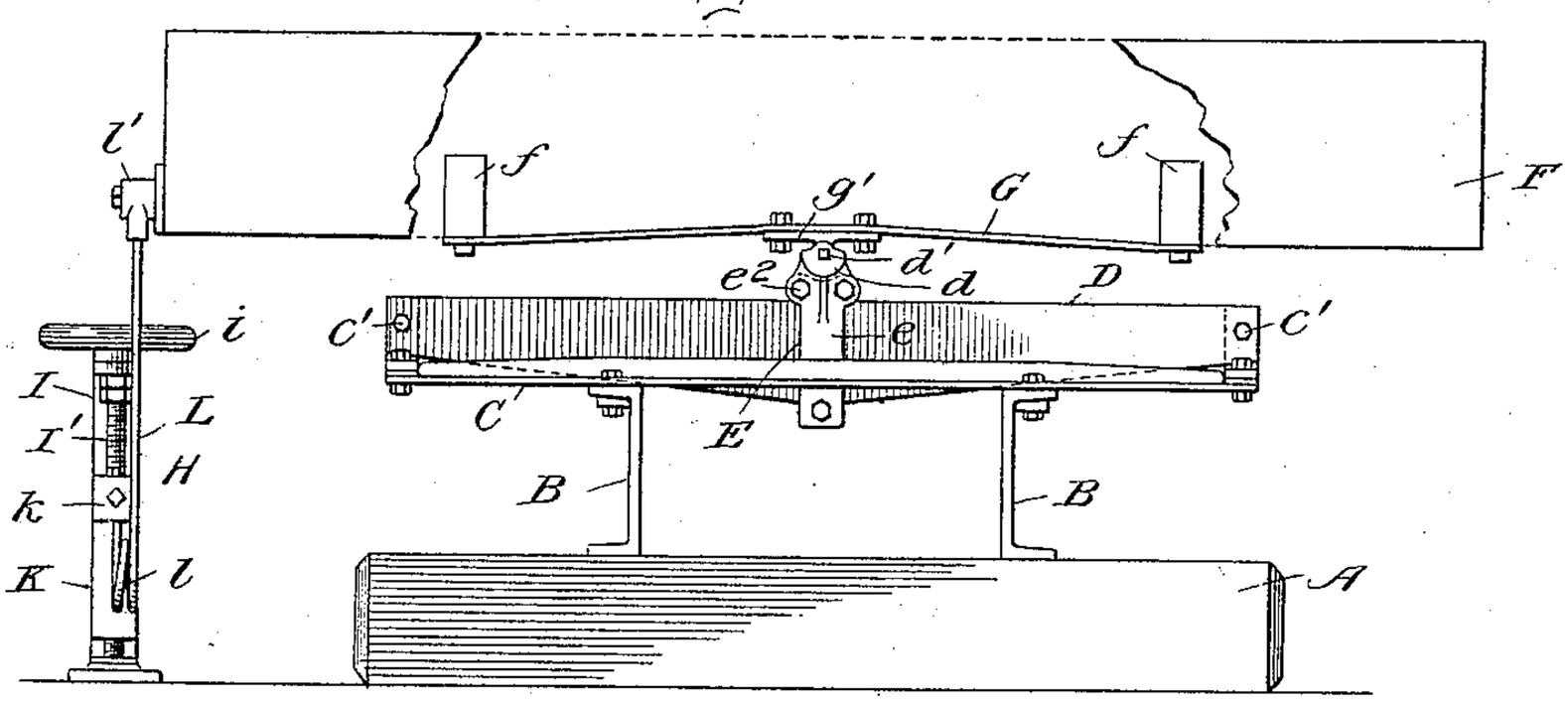
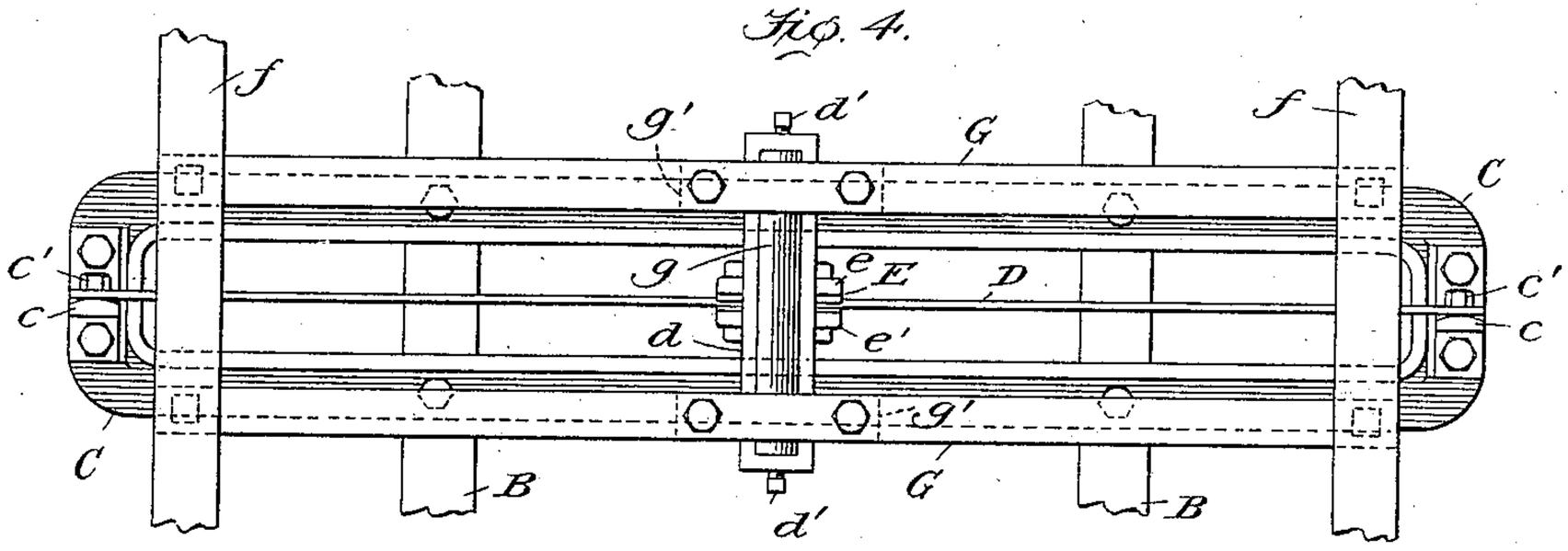


Fig. 4.



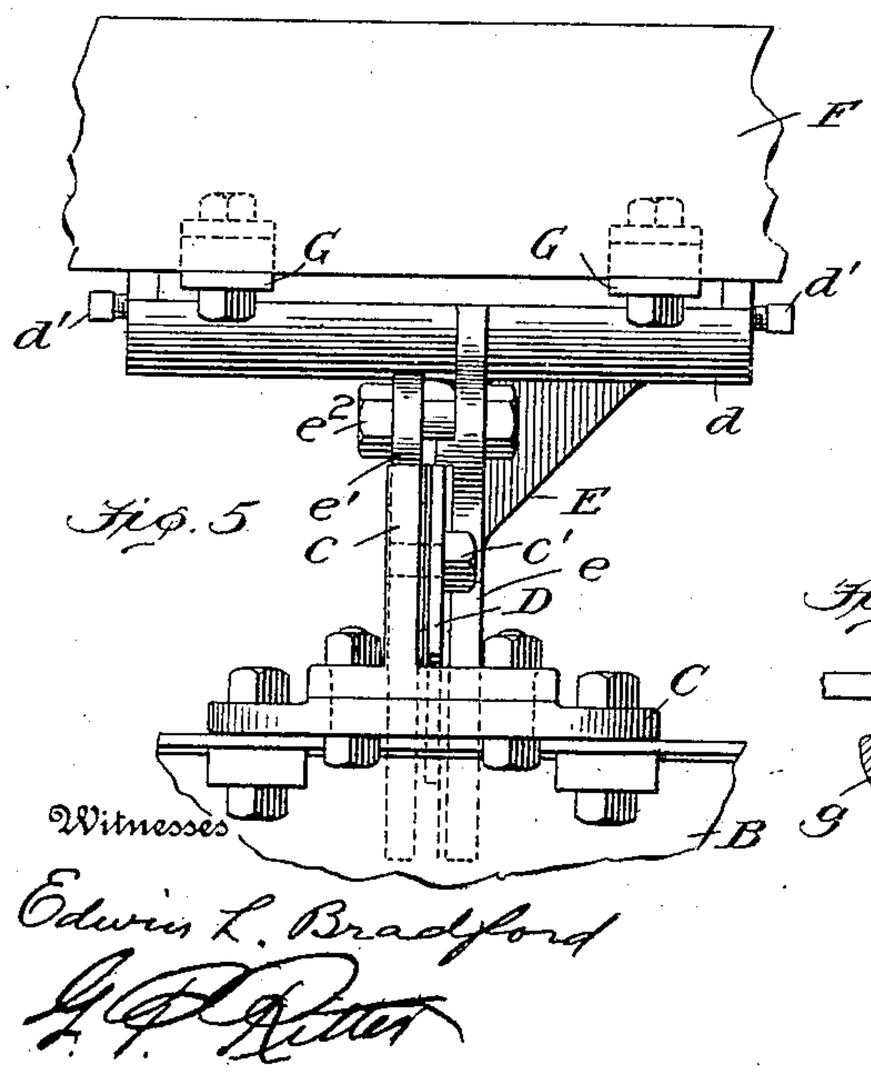


Fig. 5

Fig. 6.

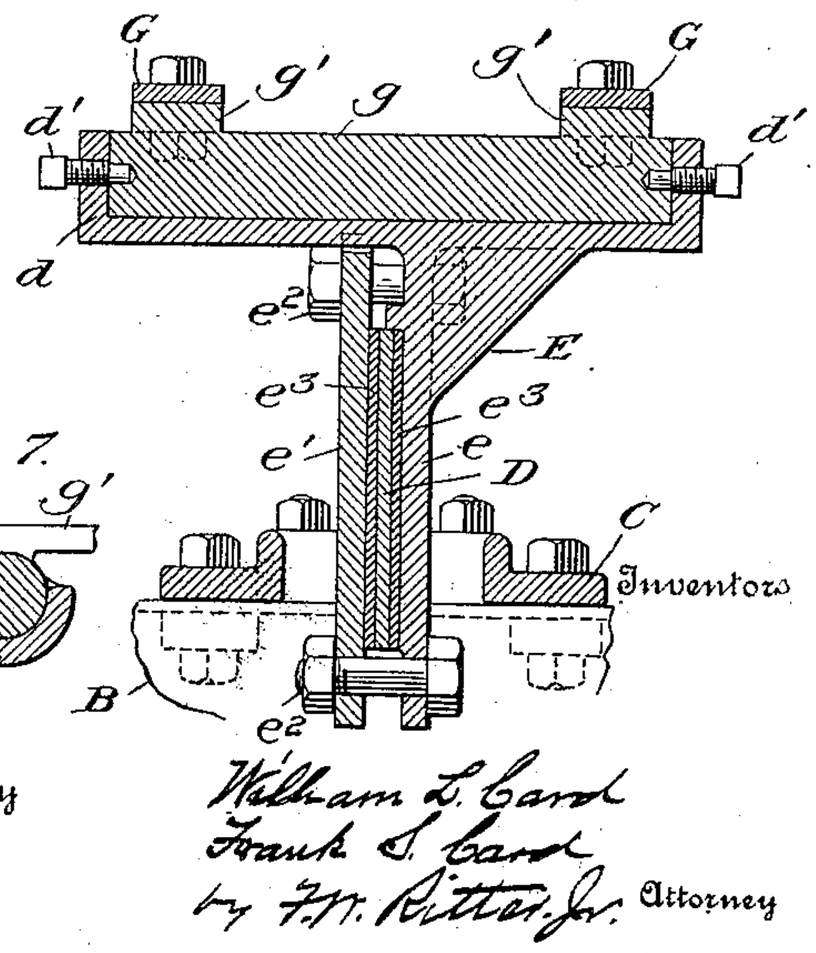
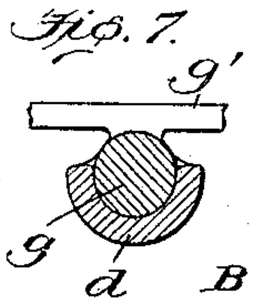


Fig. 7.



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CONCENTRATOR-TABLE SUPPORT.

No. 917,247. Specification of Letters Patent. Patented April 6, 1909.

Application filed September 24, 1908. Serial No. 454,605.

To all whom it may concern:

Be it known that we, WILLIAM L. CARD and FRANK S. CARD, citizens of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Concentrator-Table Supports; and we 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.

Our invention relates generally to the manner of mounting concentrator tables which have a longitudinal reciprocatory motion and a lateral adjustable inclination, and has for its object to provide means whereby any desired number of flexible table supports may be employed, said supports of any desired length independent of the width of the table, and also whereby the lateral inclination of the table may be adjusted independently of its flexible supports.

To this end, the principal feature of our invention involves the combination with the concentrator table and foundation therefor, of a series of flexible supports secured at or adjacent to their ends to a sub-frame, and at an intermediate point to the concentrator table whereby the length of said supports is not limited by the width of the table.

A second feature of our invention involves the provision of a hinge connection between the flexible supports and the table, at a point intermediate of the ends of said flexible supports, whereby the adjustment of the lateral inclination of the table is rendered independent of the flexible supports of the table.

There are other, minor, features of invention embodied in certain combinations and elemental constructions, all as will hereinafter more fully appear.

In the drawings accompanying this specification and forming part of the same, Figure 1 is a side elevation of a concentrator table and its supports embodying our invention. Fig. 2 is a plan view of the sub-frame, table supports, and adjusting devices, the concentrator table omitted. Fig. 3 is an enlarged end view of the concentrator table, its sub-frame, and supports, part of the table being broken away. Fig. 4 is an enlarged detail plan view of the flexible table supports together with portions of the table-stringers and channel iron stringers or girders of the sub-frame. Fig. 5 is an enlarged view in elevation of one of the flexible blade clamps and hinge joints whereby the concentrator table is adjustably supported on the flexible table support. Fig. 6 is a vertical section of the clamp and hinge joint shown in Fig. 5. Fig. 7 is a transverse section of the cup and pin constituting the hinge joint shown in Figs. 5 and 6.

Like symbols refer to like parts wherever they occur.

We will now proceed to describe the preferred form of our invention more fully so that others skilled in the art to which it appertains may apply our invention either in the form illustrated in the drawing or in such modification thereof as circumstances may dictate.

In the drawings, A, A indicate cross timbers arranged on a suitable foundation and forming the supports of the sub-frame stringers or girders B, B which latter may be of any suitable character, but are preferably formed of channel iron, as shown in the drawings, as thereby any loss of shape in the sub-frame and resultant loss of alinement of the working parts is prevented.

Resting upon and secured to the sub-frame stringers B, B are a series of cross frames or saddles C, C, corresponding in number with the number of flexible blade table supports it is desired to use. As illustrated in the drawings there are three such saddle frames and flexible-blade table supports, but owing to the construction devised by us said number may be increased, as may also the length of the saddle frames and flexible blade supports, as conditions may require. These frames, or saddles, may be of wrought iron, but are preferably of cast metal of a length commensurate with the length of the flexible table supports it is desired to employ, and at the opposite ends of said frames they are provided with stubs or posts *c* for the attachment of said flexible table supports, which stubs or posts are pierced for the passage of the bolts *c'* whereby the flexible blades or table supports are attached thereto, and are rounded on the face with which the flexible blade contacts so as to permit the unobstructed flexure of said support or blade.

The stubs or posts *c* may be formed independent of frame or saddle C and attached thereto by suitable means, as shown in the drawings, or, if preferred, may be formed integral with the frame or saddle C.

D, D indicate the horizontally disposed flexible supports for the concentrator table, which are preferably in the form of spring steel blades widest at mid-length and decreasing in width toward the ends, and are arranged on edge or vertically as to their widths in the saddles or frames C, C, to the posts *c c* of which the blades are secured at or adjacent to their ends as hereinbefore noted. To these flexible spring-blades, at mid-length, the table is connected along its longitudinal central line by suitable clamp and hinge connections, E, E, so that the flexible spring blades D, D will vibrate in the direction of the length of the table, and the table will be adjustable with relation to the flexible blades.

The preferred form of clamp and hinge connection is one wherein the clamp is composed of two members (or plates) *e* and *e'* which span the flexible-blade and are connected above and below the same by bolts e^2 or in other suitable manner. Leather or an equivalent packing e^3 may be interposed between the clamp members and the flexible blade D.

Upon the upper end of clamp member *e* is provided a transversely disposed segmental cylindrical cup or socket *d* for the reception of the cylindrical pin member of the hinge, which latter is attached to the underside of the concentrator table. The ends of said cup or socket *d* are pierced for the passage of set screws *d'* for securing the pintle. This construction will not only prevent any longitudinal movement or lifting of the parts, but will at the same time maintain the vertical position of the flexible blade D at its mid-length as well as at its ends.

F indicates the concentrator table and *f, f* the stringers thereof. On the underside of the table F and extending between the stringers *f, f* thereof are iron cross-bars or straps G attached to said stringers and which afford attachment for the pin members of the hinges along the median line of the concentrator table. These cross-bars may have a slight camber as indicated in the drawings.

g indicates the cylindrical pin member of the hinge joint provided with straps or plates *g'* by means of which it may be connected to the cross-bars or straps G, and thus support the concentrator table from the flexible spring blade D. These centrally disposed hinge joints E, E permit the lateral tilting of the table to any desired inclination, and in order to adjust the table and secure it after adjustment in such manner that its reciprocatory motion will not be interfered with, an adjusting mechanism H located on the foundation is provided.

The adjusting mechanism of the table comprises a post, supported on the foundation or at some other suitable point off of and to one side of the table, a threaded shaft, a nut which travels thereon, and a spring rod. The threaded rod I' is stepped at its lower end and loosely journaled on the post I at its upper end, and is provided with a suitable hand wheel *i* by means of which it may be rotated. Upon said threaded rod or shaft I' is an internally threaded sleeve or nut K which is attached by a suitable clamp *k* one end of a spring-rod L, said rod having one or more coils *l*, the opposite end of which spring-rod is secured to the side of the concentrator table by means of a pivot joint *l'*, or in any other suitable manner which will not impede the movement of the table and yet effect a positive connection between the concentrator table and said rod L.

Properly supported by and positioned on the stringers or girders B, B of the sub-frame is suitable mechanism M for imparting a longitudinal movement to the concentrator table and a return spring *m*, or its equivalent, may also be provided for effecting the return movement of the table, and these are in alinement with the hinge connections between the concentrator table and the flexible blade supports therefor.

The construction and arrangement of the several elements of the structure being substantially such as hereinbefore pointed out the operation of the devices will be as follows: When reciprocatory movement is imparted to the concentrator table there is a flexure in one direction of the flexible blades D, D corresponding to the movement of the table, and thereafter a reaction which supplements the operation of the return spring *m*, and may under certain conditions be relied on as a substitute for the return spring. The adjustment of the lateral inclination of the table will be effected by a rotation of the hand wheel *i* and the threaded rod I' which causes the upward or downward movement of the sleeve or nut K, according to the direction in which the hand wheel is rotated, and the corresponding movement of the spring rod L and the side of the table F to which said rod is attached. The spring-rod L with its pivotal connection with the table permits the unhampered movement of the table, while maintaining the adjustment thereof.

Among the advantages incident to our arrangement of the connections between the flexible supports, table, and sub-frame, are, first, that the length of the supports are not limited by the width of the table, second, the adjustment of the lateral inclination of the table is independent of the flexible supports, and, third, the inclination of the table

is effected without so imposing the load on the flexible supports as to add a lateral component to the reciprocatory movement of the table which would be detrimental to stratification of the concentrates.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. The combination with a concentrator table and its sub-frame, of interposed flexible blades secured to said table at mid-length and to the sub-frame adjacent to their ends, said blade being arranged to vibrate in the direction of the length of the table, and said table being adjustable with respect to said blades.

2. The combination with a concentrator table and its sub-frame of interposed flexible blades having hinged connection with the table at their mid-lengths and attached to the sub-frame adjacent to their ends.

3. The combination with a concentrator table and its sub-frame of a saddle frame supported by the sub-frame, a flexible-blade secured to the saddle frame adjacent to its opposite ends and to the table intermediate of its ends.

4. The combination with a concentrator table and its sub-frame, of a saddle frame supported on said sub-frame and provided at its opposite ends with stubs or posts, a vertically disposed flexible-blade secured at its ends to said stubs or posts and at an intermediate point to the concentrator table.

5. The combination with a concentrator table and its sub-frame, of interposed flexible blade supports having hinged connections at their mid-lengths with the table and connected adjacent to their ends with the sub-frame, and means supported at a point off the table for adjusting and maintaining the lateral inclination of the table.

6. The combination with a concentrator table and a horizontally disposed flexible support therefor, said support secured adjacent to its ends, of a clamp secured to the flexible support intermediate of its ends, and a segmental cylindrical cup and cylindrical pintle hinge connection between the table and clamp.

7. The combination with a concentrator table and a horizontally disposed flexible support therefor, said support secured adjacent to its ends, of a clamp secured to the flexible support intermediate of its ends, a segmental cylindrical cup and cylindrical pintle hinge connection between the clamp and table, and set screws in the ends of the cup member of the hinge which engage the ends of the cylindrical pintle member of said hinge.

8. The combination with a concentrator table, and horizontally disposed flexible supports therefor, said table and flexible supports being relatively adjustable, and said flexible supports being arranged to vibrate in the direction of the length of the table, of an adjusting mechanism comprising a threaded rod, a nut operated by said rod, and a spring rod provided with a coil and having its ends respectively connected with the concentrator table and the nut operated by the threaded rod.

9. The combination with a concentrator table and its sub-frame, of flexible supports secured to the sub-frame adjacent to their ends, said table and said supports being relatively adjustable and the central portions of said supports being movable longitudinally with and in the line of movement of the table.

10. The combination with a concentrator table of horizontally disposed flexible supports, the central portions of said supports being movable with the table, and the flexible supports being arranged to vibrate in the direction of the length of the table.

In testimony whereof we affix our signatures, in presence of two subscribing witnesses.

WILLIAM L. CARD.
FRANK S. CARD.

Witnesses:
JAMES N. FLOOD,
FRANK B. MCFARLANE.