

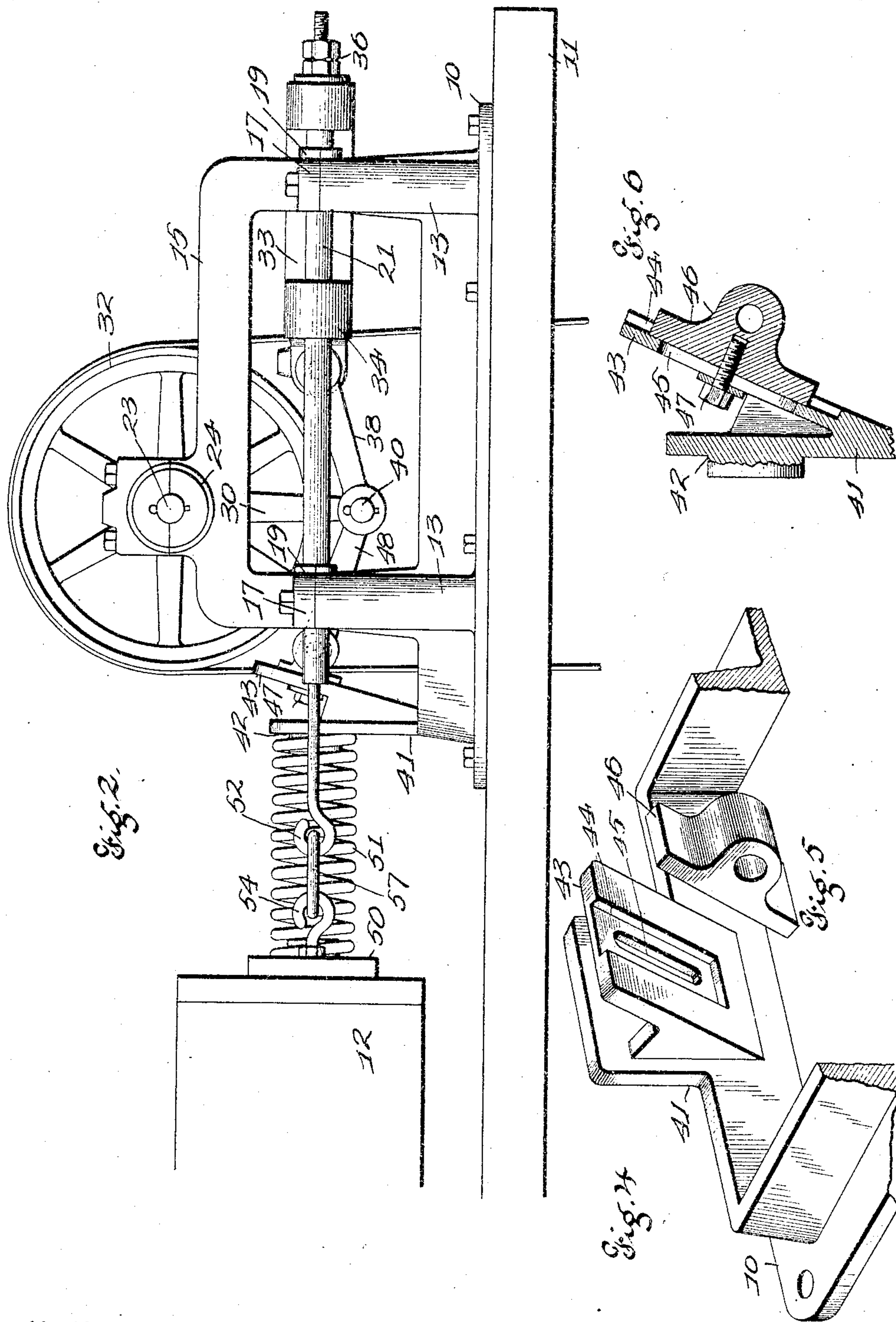


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## SHAKER FOR CONCENTRATING TABLES.

APPLICATION FILED MAY 10, 1904.

3 SHEETS—SHEET 2.



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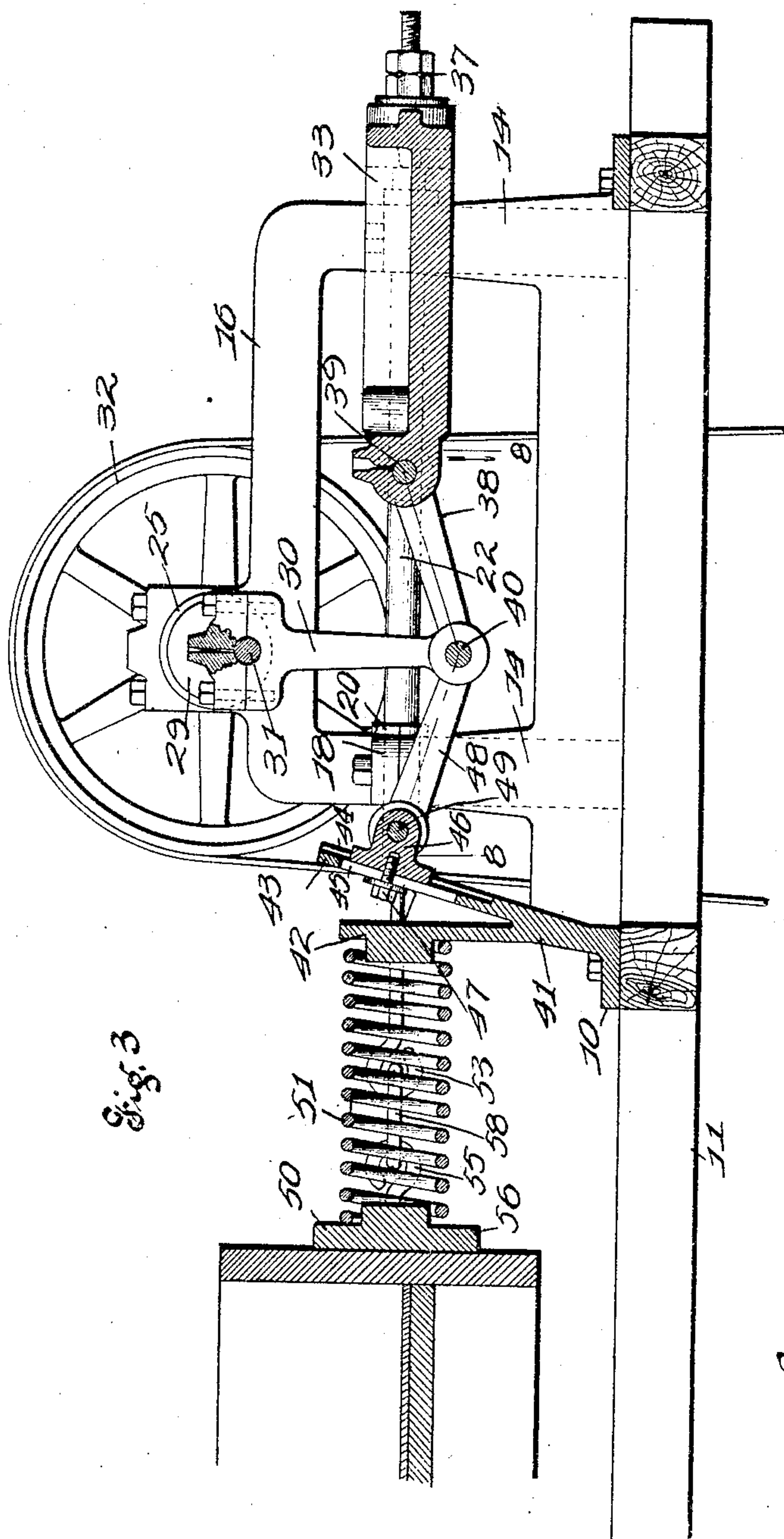


Fig. 3

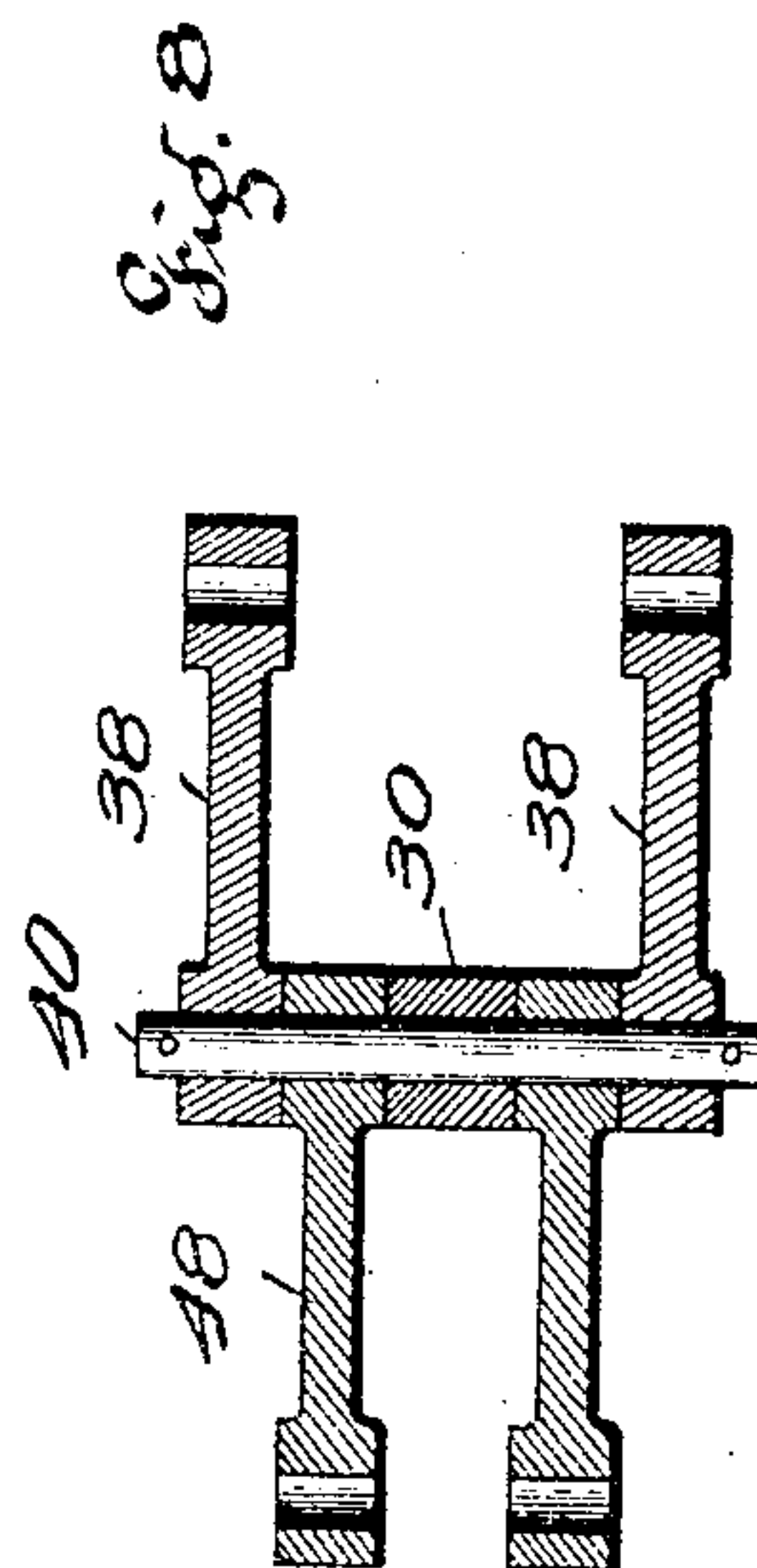


Fig. 8

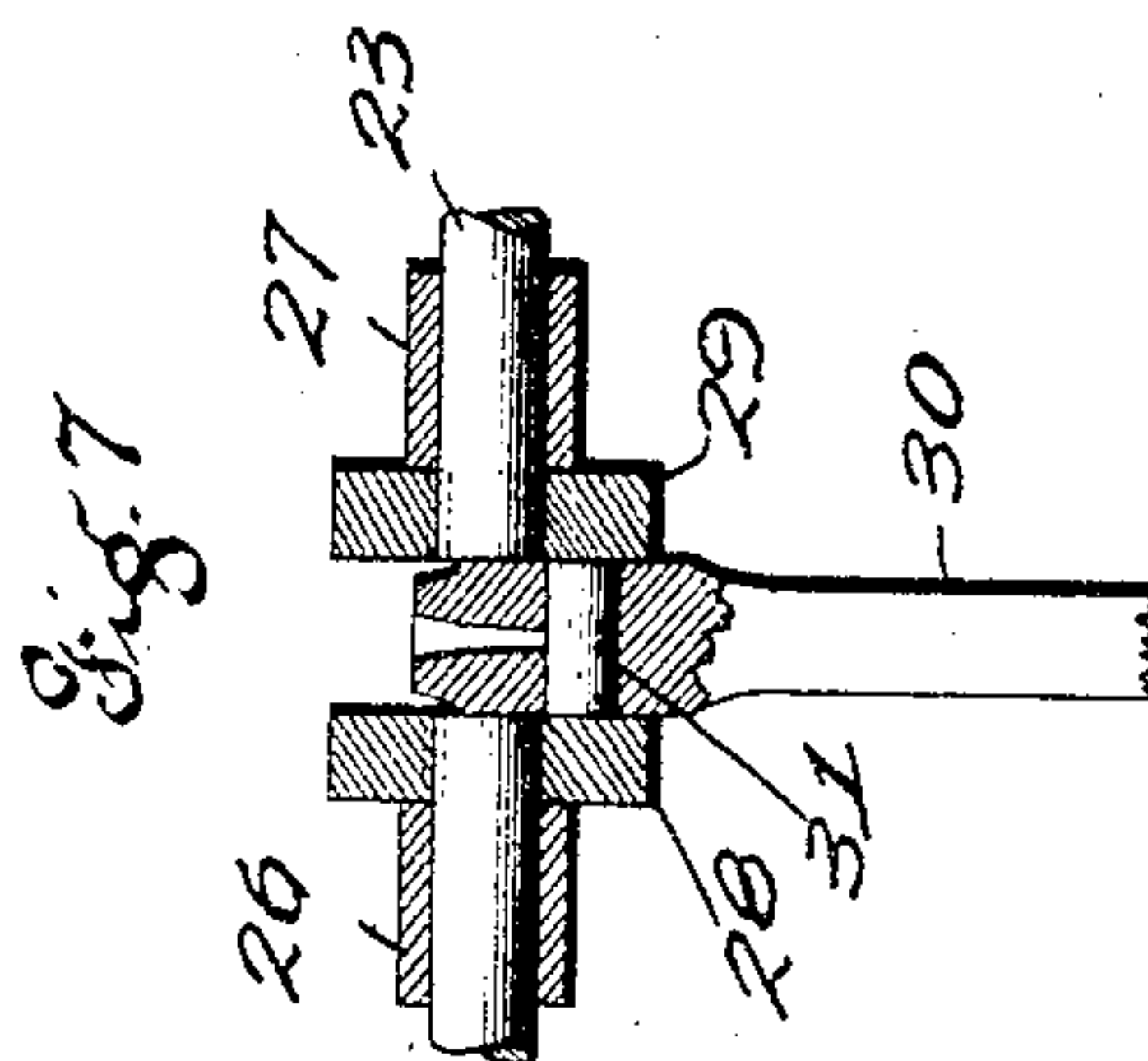


Fig. 7

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# UNITED STATES PATENT OFFICE.

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CHARLES D. McLURE AND PAUL A. FUSZ, OF ST. LOUIS, MISSOURI.

## SHAKER FOR CONCENTRATING-TABLES.

SPECIFICATION forming part of Letters Patent No. 779,857, dated January 10, 1905.

Application filed May 10, 1904. Serial No. 207,335.

*To all whom it may concern:*

Be it known that I, JOHN KLEIN, a citizen of the United States, and a resident of Desloge, St. Francois county, State of Missouri, have  
5 invented certain new and useful Improvements in Shakers for Concentrating-Tables, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings,  
10 forming a part hereof.

My invention relates to shakers for concentrating-tables; and it consists of the novel features herein shown, described, and claimed.

In the drawings, Figure 1 is a top plan view  
15 of a shaker connected to a concentrating-table embodying the principles of my invention, the table being partly broken away. Fig. 2 is a side elevation as seen looking in the direction indicated by the arrow 2 in Fig. 1.  
20 Fig. 3 is a sectional elevation on a plane parallel with Fig. 2 and on the line 3 3 of Fig. 1. Fig. 4 is a detail perspective upon an enlarged scale, showing the seat and support for the adjustable head, to which one end of the  
25 toggle-joint is connected. Fig. 5 is a perspective of the adjustable head. Fig. 6 is a cross-section of the parts shown in Figs. 4 and 5 and taken on the line 6 6 of Fig. 1. Fig. 7 is a sectional detail on the line 7 7 of Fig. 1.  
30 Fig. 8 is a sectional detail on the line 8 8 of Fig. 3.

Referring to the drawings in detail, the iron base 10 rests upon the wooden sills 11, said sills extending from under the concentrating-  
35 table 12. The concentrating-table is shown broken away and the connection between the table and sills, whereby the table is supported, is omitted. A pair of posts 13 extend upwardly from one side of the base, and a similar  
40 pair of posts, 14, extend upwardly from the other side of the base. The side bars 15 and 16 are formed integral with the caps 17 and 18, and said caps are secured to the upper ends of the posts 13 and 14, there being lon-  
45 gitudinally-alined bearings 19 and 20 between the caps and the posts, and the reciprocating rods 21 and 22 are slidingly mounted in said bearings. A crank-shaft 23 is mounted in bearings 24 and 25, said bearings being

supported by the side bars 15 and 16 in trans- 50  
verse alinement. The spacing-sleeves 26 and 27 are placed upon the crank-shaft 23 inside of the bearings, in order to locate the crank-pin heads 28 and 29. The driving-rod 30 is  
55 mounted upon the crank-pin 31 between the heads 28 and 29 and extends downwardly. The driving-pulleys 32 are mounted upon the outer end of the crank-shaft 23. A sliding head 33 has a pair of bearings 34 mounted  
60 upon the reciprocating rod 21 and a similar pair of bearings, 35, mounted upon the reciprocating rod 22. The extreme rear ends of the reciprocating rods 21 and 22 are reduced to form shoulders against which the rear ends  
65 of the bearings 34 and 35 are clamped by the nuts 36 and 37, so as to rigidly connect the sliding head 33 to the reciprocating rods. Links 38 are connected to the head 33 by the pin 39, and said links are connected to the  
70 lower end of the driving-rod 30 by the pin 40. A post 41 extends upwardly from the forward end of the base 10 and at its transverse center to support the spring-seat 42. An arm 43 extends upwardly from the post 41 behind  
75 the spring-seat 42, the rear face of said arm 43 being inclined and recessed to form the toggle-joint-head seat 44 and there being an adjusting-bolt slot 45 through said seat. The  
80 toggle-joint head 46 fits in the seat 44 and is held adjustably in position by the adjusting-bolt 47, inserted through the slot 45 and screw-seated in the head, so that by manipulating  
85 the bolt 47 the head may be adjusted up or down upon the seat 44. Links 48 are connected to the head 46 by the pin 49, and said links are connected to the links 38 and the driv-  
90 ing-rod 30 by the pin 40, so that as the crank-shaft 23 rotates the driving-rod 30 works the toggle-joint formed by the links 38 and 48 and reciprocates the head 33, thus sliding the re-  
95 ciprocating rods 21 and 22 backwardly and forwardly through the bearings 19 and 20. A spring-seat 50 is mounted upon the concentrating-table 12 in alinement with the spring-seat 42, and an expansive coil-spring 51 is inserted between the said spring-seats 42 and 50, the tension of said spring being exerted to move the concentrating-table forwardly.



Eyes 52 and 53 are screwed into the forward ends of the reciprocating rods 21 and 22, and similar eyes, 54 55, are screwed into the plate 56, which is attached to the rear side of the  
 5 concentrating-table and which carries the spring-seat 50. A link 57 loosely connects the eyes 52 and 54, and a similar link, 58, loosely connects the eyes 53 and 55, so that when the reciprocating rods 21 and 22 are operated the  
 10 concentrating-table will be drawn backwardly against the tension of the spring 51 and so that when the reciprocating rods move forwardly the links 57 and 58 will be loosened until the concentrating-table is moved for-  
 15 wardly by the tension of the spring 51 to tighten said links.

The crank-shaft operates at a high rate of speed. The concentrating-table is comparatively large and heavy and moves slowly un-  
 20 der the action of the spring 51. When the head 33 moves backwardly, the concentrating-table is drawn against the spring 51, compressing the spring considerably, and as the operating-head 33 moves forwardly a great  
 25 deal faster than the concentrating-table can be moved by the spring the links 57 and 58 become slack. Then as the head 33 moves backwardly a jarring motion is imparted to the concentrating-table by the tightening of  
 30 the links 57 and 58. Thus I produce a rapid jarring of the concentrating-table by the lost motion or looseness of the links 57 and 58, together with the slow action of the spring and the rapid action of the crank-shaft and  
 35 its connections.

I claim--

1. In a shaker for concentrating-tables: the reciprocating rods 21 and 22 slidingly mounted;  
 40 the crank-shaft 23 mounted above and transversely of the rods; the driving-rod 30 operated by the crank-shaft; the sliding head

33 rigidly mounted upon the reciprocating rods 22 and 23; the arm 43 rigidly mounted in an inclined position; the toggle-joint head 46 adjustably mounted upon the arm; the links 45  
 connecting the toggle-joint head to the sliding head 33 and to the driving-rod 30; a concentrating-table; the eyes 52 and 53 rigidly se-  
 50 cured to the forward ends of the reciprocating rods 21 and 22; the eyes 54 and 55 rigidly se- cured to the concentrating-table, the links 57 loosely connecting the eyes 52 and 54 the link 58 loosely connecting the eyes 53 and 55; and an expansive coil-spring between the concen-  
 55 trating-table and a rigid portion of the frame, substantially as specified.

2. In a shaker for concentrating-tables, the post 41 rigidly mounted; the spring-seat 42 upon the post; the toggle-joint-head seat 44 upon the post and inclined; the toggle-joint 60  
 head 46 adjustably mounted upon the toggle-joint-head seat; a concentrating-table; an expansive spring inserted between the concen-  
 65 trating-table and spring-seat 42; a sliding head; a loose connection between the sliding head and the concentrating-table; said loose connection consisting of the eyes 52 and 53 rigidly connected to the sliding head; the eyes 54 and 55 rigidly connected to the concentrat-  
 70 ing-table; the link 57 loosely connecting the eyes 52 and 54 and the link 58 loosely connecting the eyes 53 and 55; a toggle-joint connection between the sliding head and the toggle-joint head; a crank-shaft; and a driving-rod connecting the crank-shaft to the toggle-joint. 75

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

JOHN KLEIN.

Witnesses:

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 E. J. LAHM.