

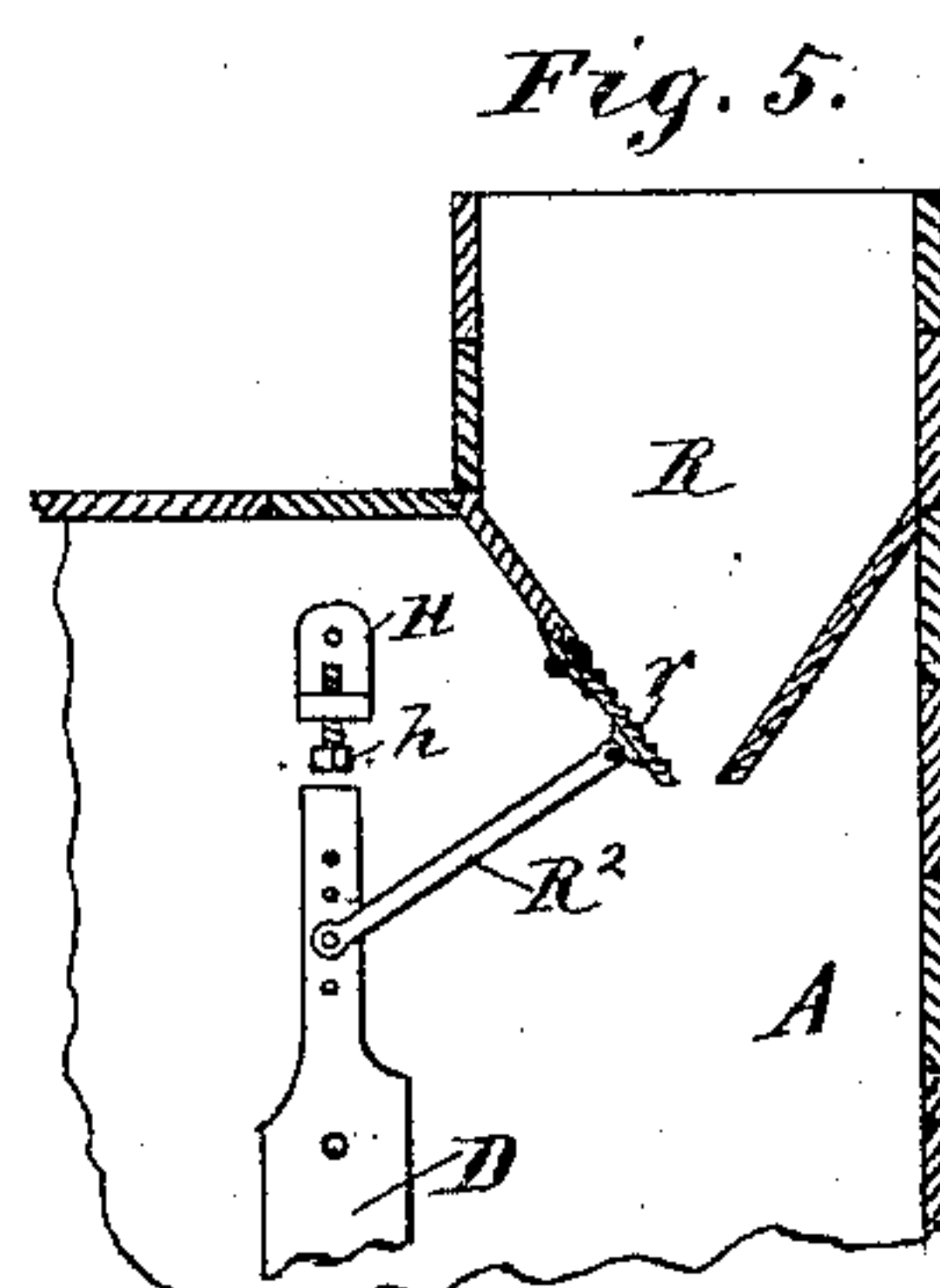
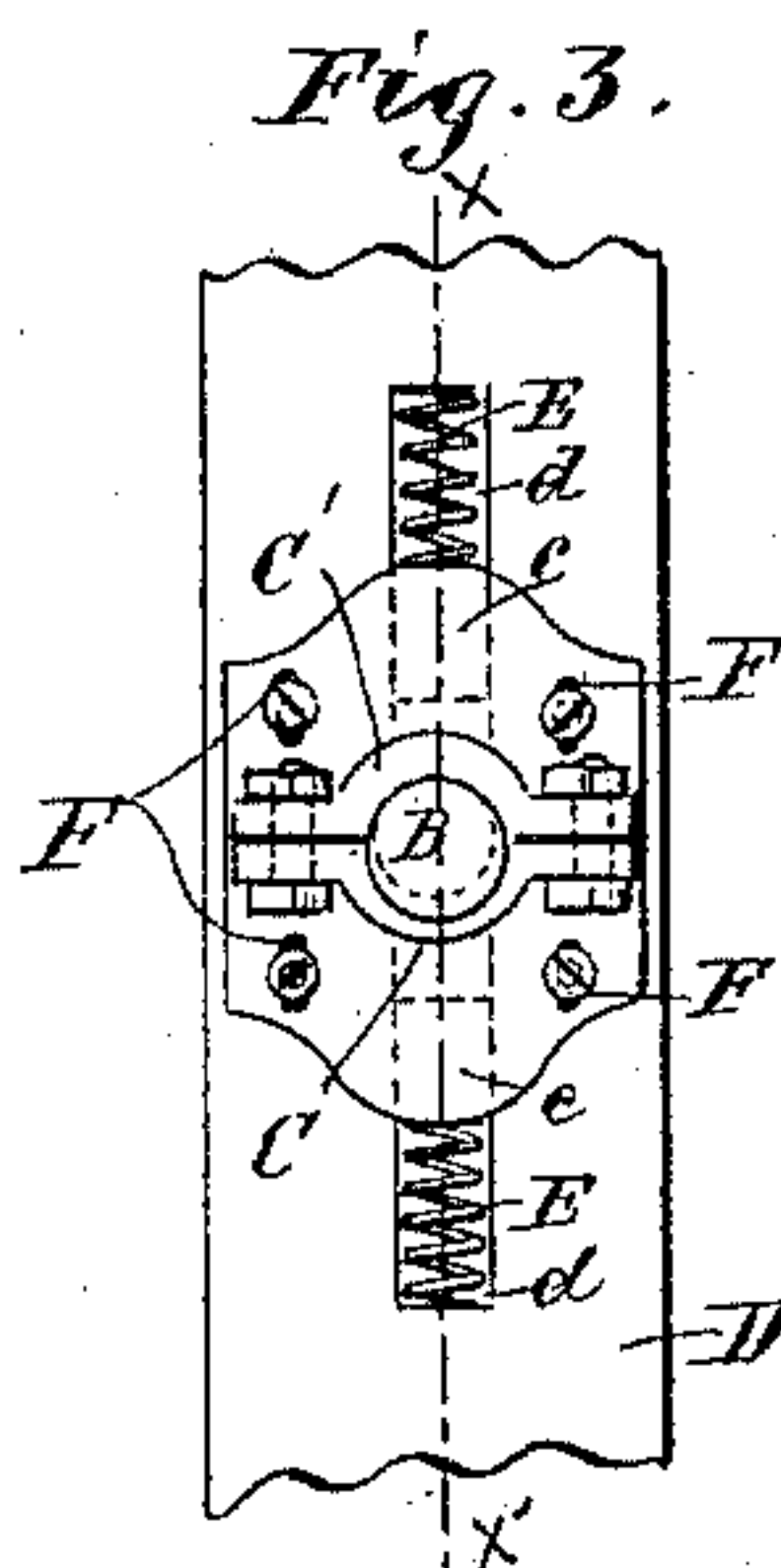
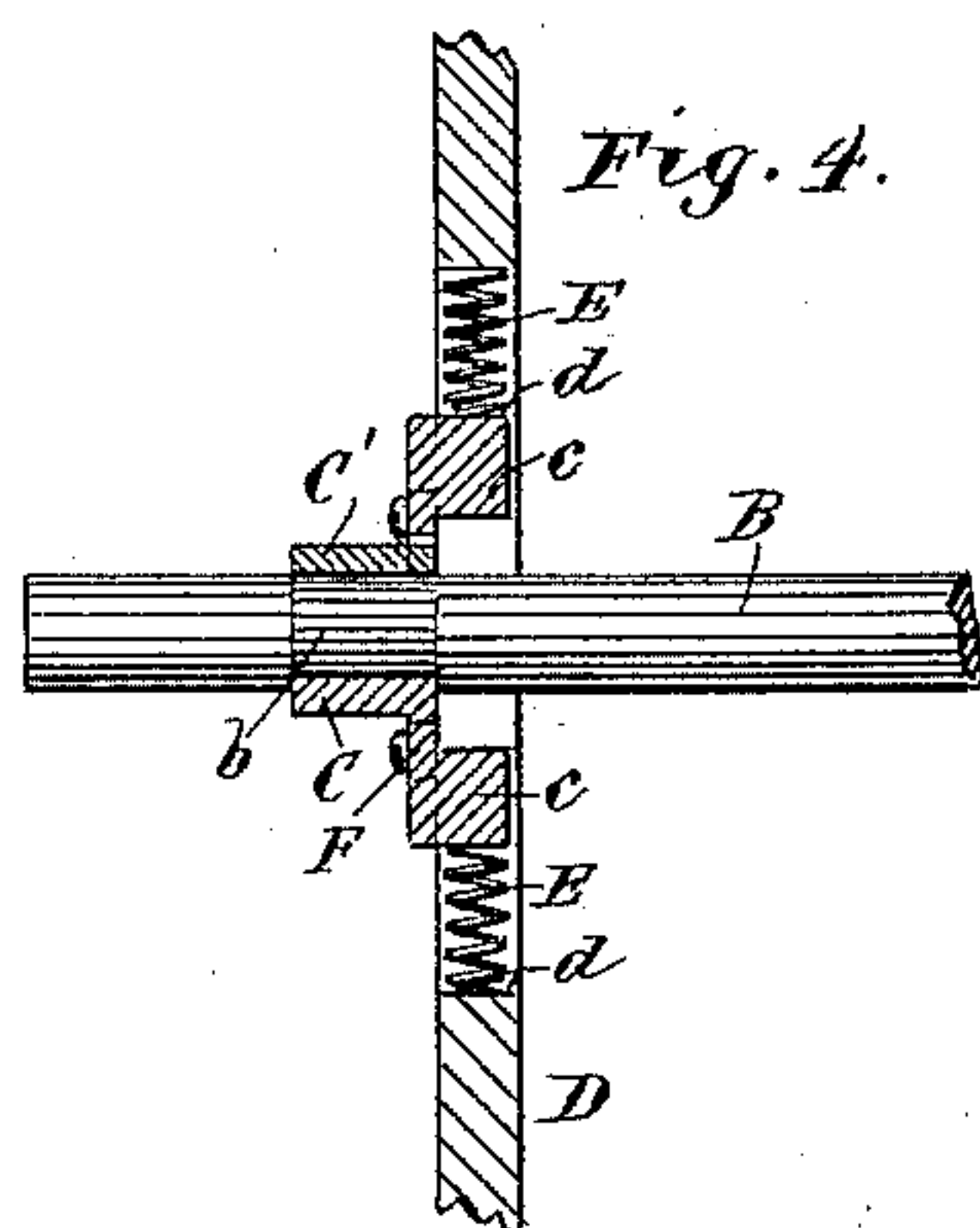
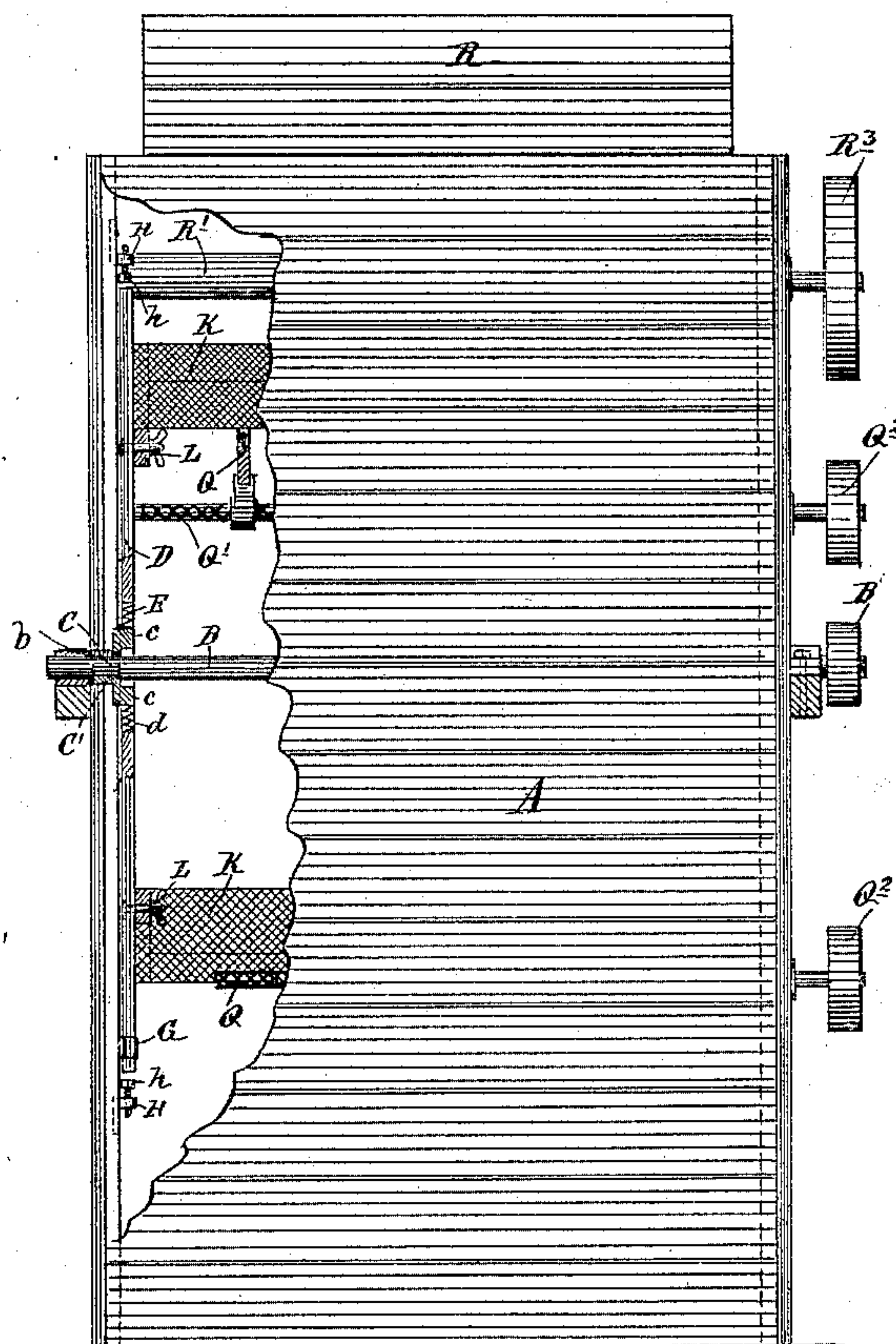
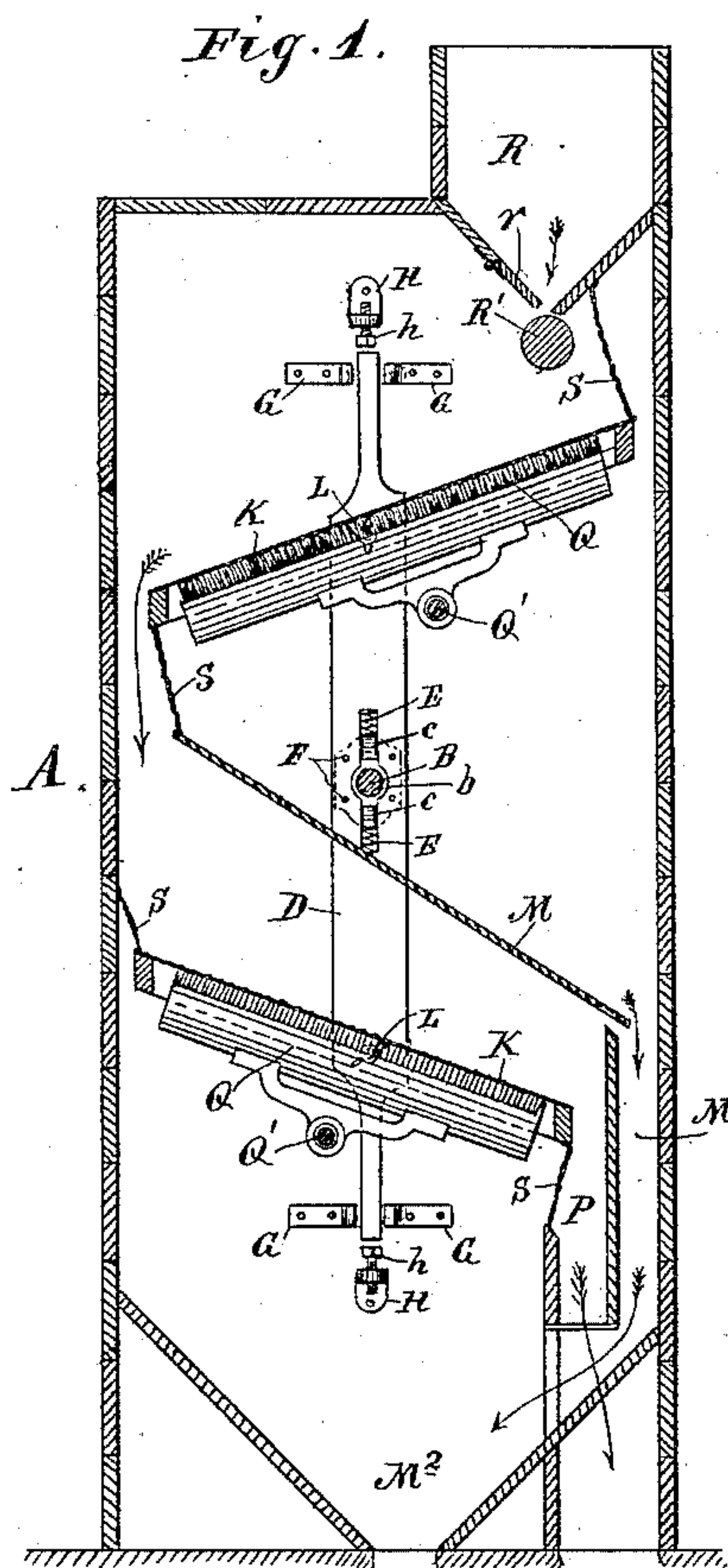
(No Model.)

J. DESJARDIN & W. J. STEWART.
GRADER AND SCALPER.

No. 473,500.

Patented Apr. 26, 1892.

Fig. 2



Witnesses.

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UNITED STATES PATENT OFFICE.

JOSEPH DESJARDIN AND WILLIAM J. STEWART, OF MINNEAPOLIS, MINNE-
SOTA; SAID DESJARDIN ASSIGNOR TO LEVI S. HOGEBROOM, OF SAME
PLACE.

GRADER AND SCALPER.

SPECIFICATION forming part of Letters Patent No. 473,500, dated April 26, 1892.

Application filed November 24, 1891. Serial No. 413,008. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH DESJARDIN and WILLIAM J. STEWART, citizens of the United States, residing at Minneapolis, in the
5 county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Graders and Scalpers; and we do hereby declare the following to be a full, clear, and exact description of the invention,
10 such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to that class of flour-mill appliances known as "graders" and "scalpers," and has for its object to provide
15 a simple and more efficient machine for effecting various separations required in the manipulation of mill-stock.

Our invention is especially directed to the mechanism for imparting motion to the sieves,
20 and the construction is such as to give to the sieves a series of short and rapid vibrations both lengthwise of the sieve and transversely to the same. We accomplish this result by mounting the sieve-support on one or more ec-
25 centric-straps working on the eccentrics of a constantly-running shaft in co-operation with stops located in the path of the support's movement under the action of the eccentrics. The eccentrics and straps would, if unimpeded,
30 impart to the said support and the sieves a regular eccentric motion moving the sieves both in a longitudinal and in a lateral or transverse direction equal to the throw of the eccentric; but in virtue of the stops the sup-
35 port is intercepted at different points in its movement, the result of which is to impart to the said support and the sieves carried thereby a series of knocks or jars, which keep the sieve-surface in a constant state of rapid and
40 violent vibrations. In order to permit the support to be intercepted in this way, it is constructed so that it will yield both laterally and longitudinally. The yielding in the longi-
45 tudinal direction is, in the construction shown, effected by spring-seating the support on the eccentric-straps and connecting the support to the straps in such a way that the strap may move independent of the support. The yielding in the lateral direction is per-
50 mitted by constructing the support in such a way as to be flexible at one or more points.

The preferred form of our invention is illustrated in the accompanying drawings, where-
in like letters refer to like parts throughout.

Figure 1 is a vertical section from front to
55 rear of the entire machine. Fig. 2 is a front elevation of the same, some parts being broken away. Fig. 3 is a detail in side elevation of one of the parallel bars constituting the sieve-support, showing the way in which the same
60 is mounted and operated from the eccentric-shaft. Fig. 4 is a vertical section of the same on the line X X' of Fig. 3. Fig. 5 is a detail in sectional elevation showing an application of the sieve motion to operate the feed-
65 hopper.

A is the case or frame, in which the other parts are mounted.

B is a constantly-running shaft located near the center of the case and provided with ec-
70 centrics *b* just inside the side walls of the case.

C C' are the parts constituting the eccentric-strap, of which the part C' is a removable
75 half-box suitably connected to the main casting C.

D are the parallel bars constituting the sieve-support, each of which is cut away to re-
ceive the casting C of the eccentric-strap, and is provided with vertical grooves *d* in which
80 the projecting parts *c* of the eccentric-strap may move. The bar D is spring-seated on the strap by means of the springs E, located in the grooves *d*. The face-plate of the strap is also connected to the bar by a slot-and-screw
85 connection, as shown at F, permitting the strap to move lengthwise of the bar.

G are sets of stops arranged on the opposite sides of the bar near the opposite ends of the same, being fixed to the side walls of the
90 case in the path of the bar's lateral motion.

H *h* are a corresponding set of stops fixed to the side walls of the case, one above and the other below the bar in the path of its longitudinal movement. The part *h* of these
95 end stops is adjustable in the fixed part H and may be set so as to entirely prevent the longitudinal movement of the bar, if so desired. The bars D are, as shown, reduced at their upper and lower ends, so as to be slightly
100 flexible. Hence when the bar is intercepted by the lateral stops it will yield to permit the

complete throw of the eccentric without breaking.

5 K K are a pair of wire-cloth sieves secured, as shown, one above and the other below the center of the bars and at reverse angles to each other. The sieves are secured to the bars, as shown, by thumb-nuts L, so that they may be set at any desired angle.

10 M is a guide-board or deflecting-plate supported in any suitable way intermediate the two sieves to keep the screenings from the upper sieve from falling onto the face of the lower sieve and directing the same through the chute M' into the bottom or outlet hopper 15 M² of the case. The tailings from the upper sieve fall onto the face of the lower sieve. The screenings from the lower sieve fall directly into the outlet-hopper and the tailings from the same into the discharge-chute P.

20 Q is the traveling brush, and Q' the double-threaded screw-shaft for operating the same.

Referring to Figs. 1 and 2, R is the feed-hopper, r the movable feed-plate of the same, and R' the feed-roll constituting the ordinary 25 feed in machines of this class.

Referring to Fig. 5, the feed-roll is dispensed with and motion is imparted to the feed-plate r by a link R², connecting the same with the movable bar D. In this modification 30 (shown in Fig. 5) the feed motion is therefore obtained directly from the sieve motion. The eccentric-shaft carries a driving-pulley B', the brush-shaft driving-pulleys Q², and the feed-roll (in Figs. 1 and 2) a pulley R³ for the application of power in any suitable way. 35 S are the ordinary dividing-aprons.

The operation on the sieves is obvious. The eccentric-shaft being in motion will tend to move the bars D, constituting the sieve- 40 support, both lengthwise of the bars and in a lateral direction, and, if unimpeded, would give to the sieves an up-and-down and a forward-and-backward regular motion. Instead of so doing, however, the lateral motion of the 45 sieve-support is always intercepted by one or another of the set of stops G. If the end stops H be in the position shown, they will also intercept the movement of the sieve-support in the vertical direction. These jars will come at 50 every quarter of the eccentric's movement, setting the sieve-surface in violent vibrations. This jarring motion, taken together with the regular motion from the eccentric, gives a compound result on the sieve-surface, which we 55 have found in actual practice to be very effective. The separation is so much better than by any other motion to us known that it enables the sieve to be set much nearer the horizontal level, thus enabling the use of a 60 less number of sieves to separate any given quantity of stock. It will be noted that the springs E permit the bars D to yield in the vertical direction when intercepted by the end stops H. In some cases it may be found 65 desirable to prevent any endwise motion of the support. In that case the screw-bolt h in the end supports would be adjusted until

they came in contact with the ends of the bar, or very nearly so. The up-and-down motion of the eccentric-strap would then be entirely 70 taken up, or very nearly so, by the springs E, and the only jars received would be from the side stops G. The side or lateral motion will in most cases be desired, because it has a propelling action on the stock to force it forward 75 down the surface of the sieve. Of course it will be understood that the character of the motion may be modified at will by varying the size or throw of the eccentric and the positions of the different sets of stops. 80

It is evident that instead of a pair of parallel bars D, mounted on separate eccentrics on the eccentric-shaft, the sieve-support might be constructed in the form of a single hub with diverging arms attached to the sieve- 85 frames and be actuated from a single eccentric and eccentric-strap. This construction, however, would not be so satisfactory nor so simple to construct. It is also apparent that instead of a slot-and-pin connection with 90 the eccentric-strap the bars D, constituting the sieve-support, might be connected therewith in any other suitable way, which would permit the same movement of the support. It should be further noted that instead of constructing the sieve-support so that it is flexible at certain points to permit the laterally- 95 yielding action the same result might be secured by mounting the support on the eccentric-strap, so that the lateral motion would 100 take place against springs, as the longitudinal motion is taken in the construction shown.

The improved motion herein described not only gives a machine of increased capacity, as before stated, but also gives an improvement 105 in the quality of the work, as it enables the use of finer cloth giving closer separations and more even grades. It will be understood that this motion might be applied directly to operate any form of shaking table, whether it 110 be a sieve, a grating, or an imperforate body, such as a feed-table. It will also be understood, of course, that a cam and cam-box having the same connection and relation to the sieve-support might be substituted for the eccentric 115 and the eccentric-strap shown and described without departing from the spirit of the invention; but a cam and cam-box would not give as good results as the eccentric and the eccentric-strap. It should be further noted 120 that the peculiar motion given to the sieve as the result of our invention enables the brush to be much more effective in keeping the sieve-surface clean, or, at least, the co-operation of the two—viz., our new motion and 125 the old brush—has that effect. We have found by actual practice that the sieves are kept much cleaner.

What we claim, and desire to secure by Letters Patent of the United States, is as follows: 130

1. The combination, with an eccentric-shaft, of a sieve-support mounted on the eccentric portion of said shaft, one or more sieves carried by said support, and sets of stops in the

path of said support under its motion from said eccentric, the said support being constructed to yield when intercepted by said stops, substantially as and for the purpose set forth.

2. The combination, with a shaft having a pair of eccentrics spaced apart from each other, of a pair of bars mounted one on each of said eccentrics and constructed to yield when intercepted, one or more sieves carried by said bars, and sets of stops in the paths of the said bars under their motion from the eccentrics, substantially as and for the purpose set forth.

3. The combination, with an eccentric-shaft, of one or more straps on the eccentric portions of said shaft, a sieve-support mounted on said strap and connected thereto with freedom to permit the movement of the straps independent of the support, one or more sieves carried by said support, and stops in the path of the support's movement, substantially as and for the purpose set forth.

4. The combination, with an eccentric-shaft, of a sieve-support, one or more eccentric-straps on the eccentric portion of said shaft, having a slot-and-screw connection with said support for permitting the strap to move independently of the said support in one part of the eccentric's travel, one or more sieves on said support, and stops for intercepting the support, substantially as and for the purpose set forth.

5. The combination, with an eccentric-shaft, of one or more straps on the eccentric portion of said shaft, a sieve-support spring-seated on said straps, so that the straps may move independently of the said support, one or more sieves carried by said support, and sets of stops in the path of said support for intercepting its movements, substantially as described.

6. The combination, with a shaft having eccentrics, of straps on said eccentrics, a sieve-support flexible at one or more points to permit

the same to yield laterally and spring-seated on said straps to permit it to yield longitudinally, one or more sieves carried by said support, and sets of stops arranged in the path of said support in both its lateral and longitudinal movement, substantially as described.

7. The combination, with a pair of movable bars constituting a sieve-support, of a series of sieves secured to said bars at reverse angles to each other, dividing-boards between the sieves, a shaft having a pair of eccentric-straps on said eccentric, secured one to each of said bars, and stops in the paths of the said bars for imparting the motion of the said bars uniformly to the entire series of sieves, substantially as described.

8. The combination, with a suitable case, of the shaft B, having the eccentrics *b*, the pair of bars D, flexible at some point to permit the same to yield laterally, the eccentric-straps C C', having slot-and-screw connection with said bars, the springs E between the eccentric-straps and the said bars, the sets of stops G and H *h*, and the sieves K, secured to the said bars, the said parts being arranged and operating substantially as described.

9. The combination, with the eccentric-shaft, of the sieve-support mounted on the eccentric portion of said shaft, stops in the path of the sieve-support under its motion from the eccentric-shaft, a feed-hopper having a movable feed-plate, and a link connecting said feed-plate with said sieve-support, whereby the feed is operated from the sieve motion, substantially as described.

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

JOSEPH DESJARDIN.

WILLIAM J. STEWART.

Witnesses:

JAS. F. WILLIAMSON,
EMMA F. ELMORE.