

No. 754,839.

PATENTED MAR. 15, 1904.

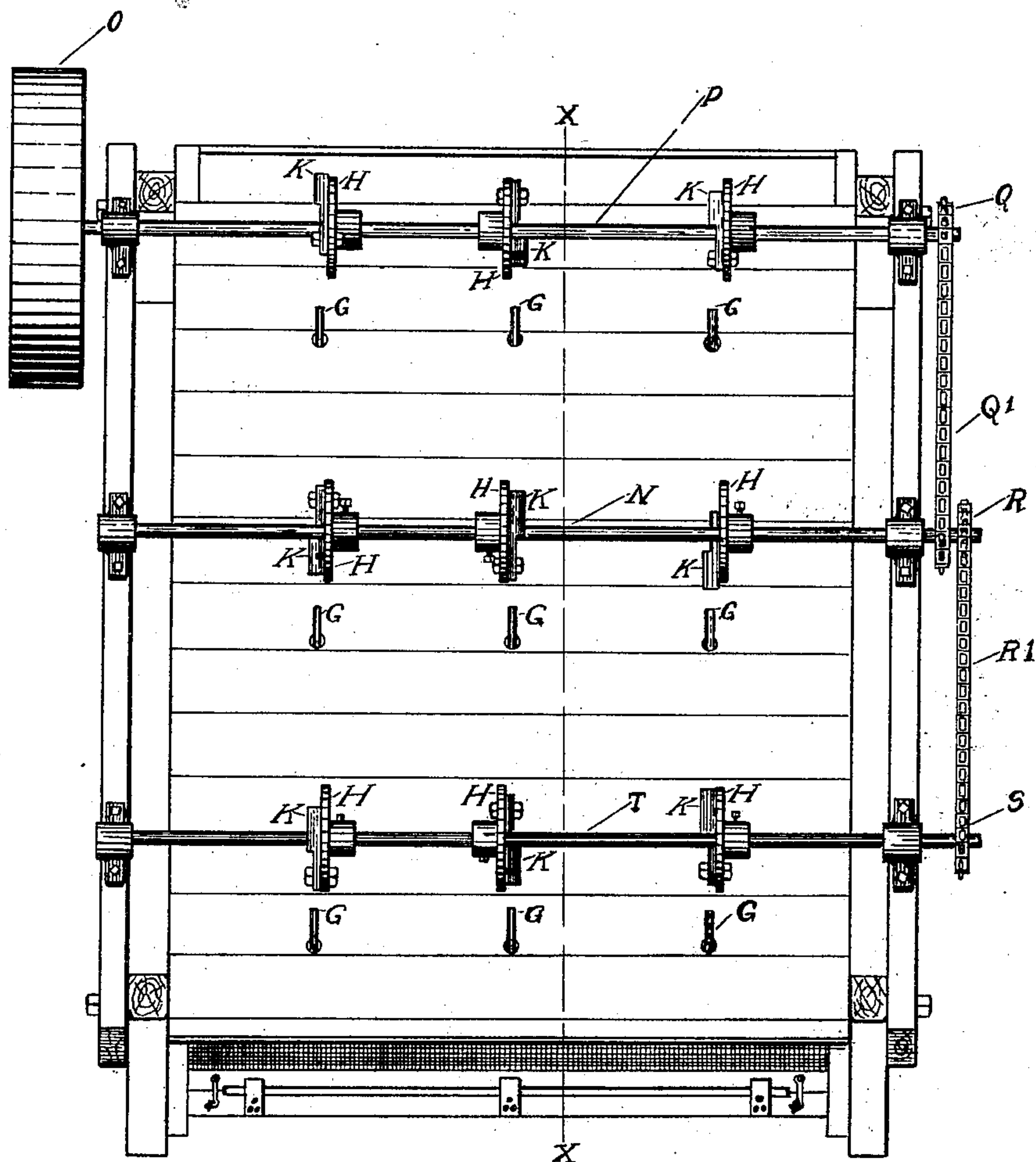
W. J. BELL.
VIBRATING SCREEN.

APPLICATION FILED NOV. 5, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

FIG. 1.



Inventor

Witnesses

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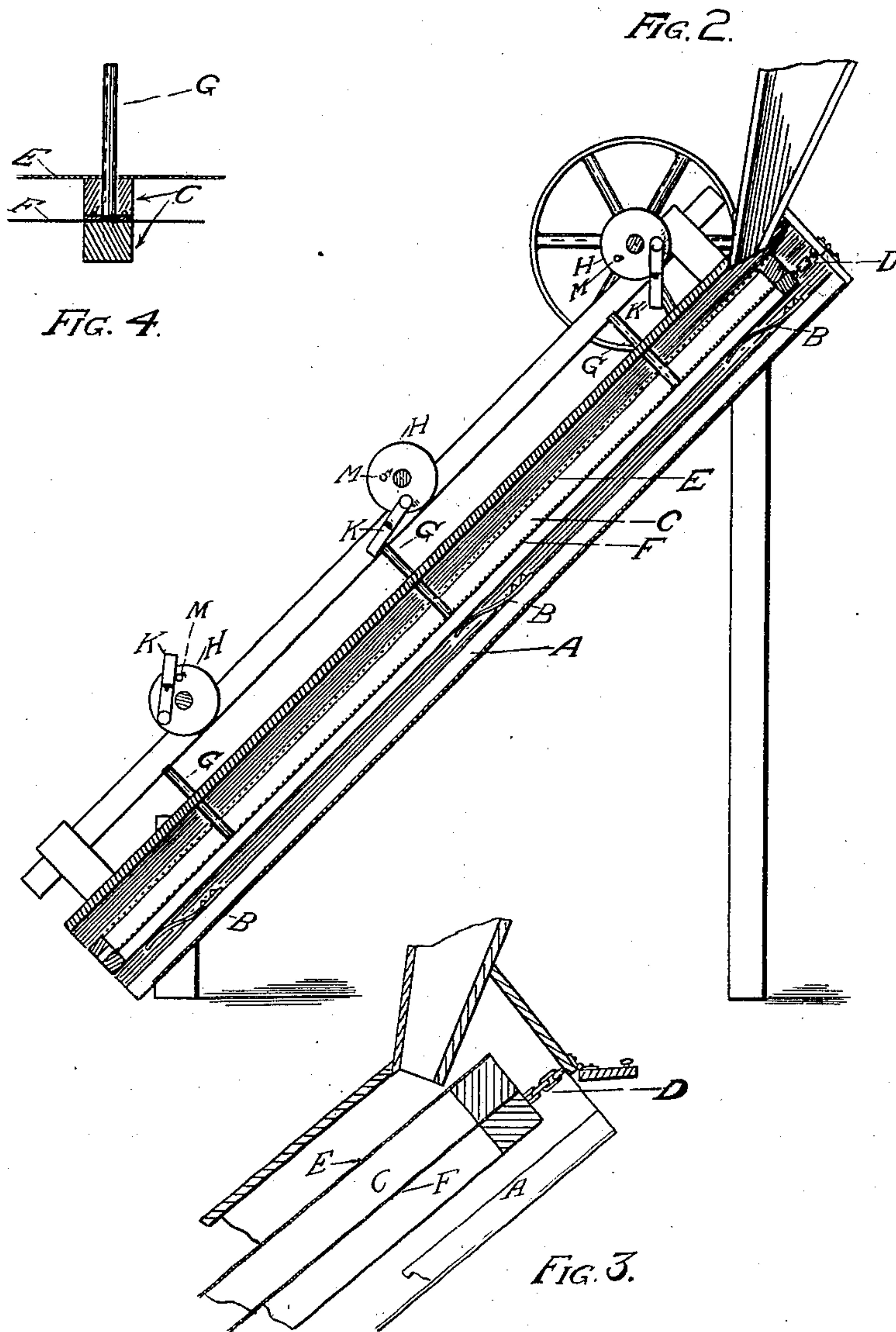
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

FIG. 5

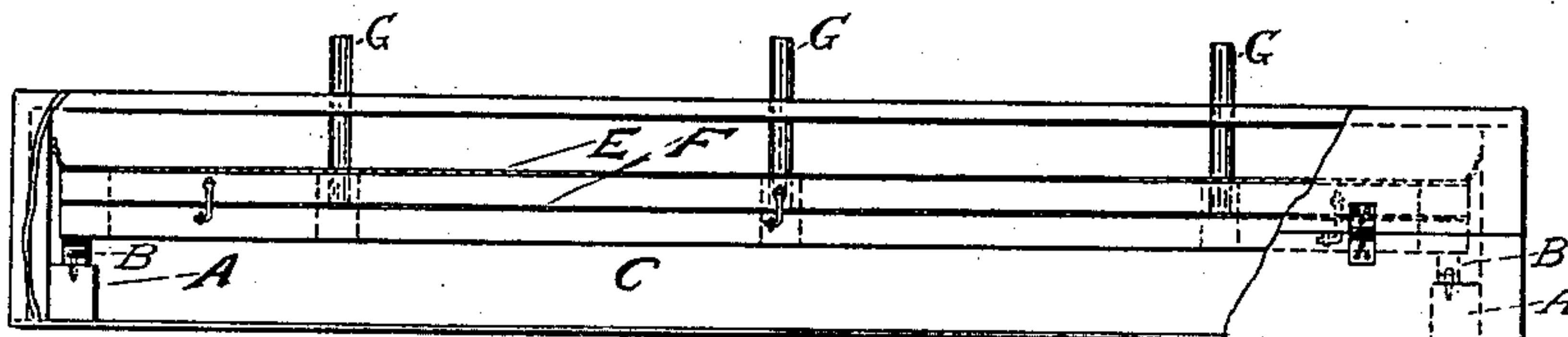
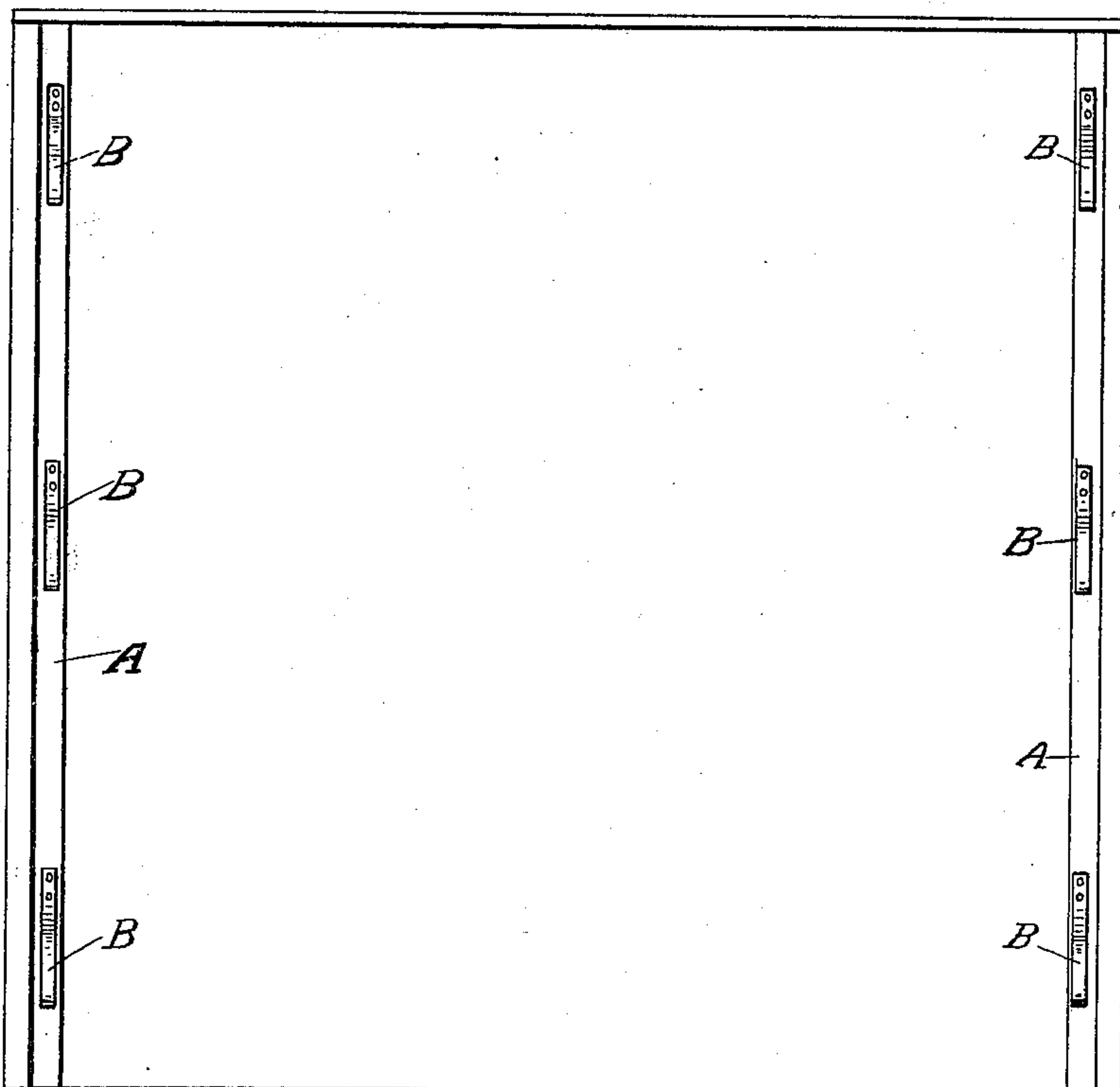


FIG. 6



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NO MODEL.

4 SHEETS—SHEET 4.

FIG. 7.

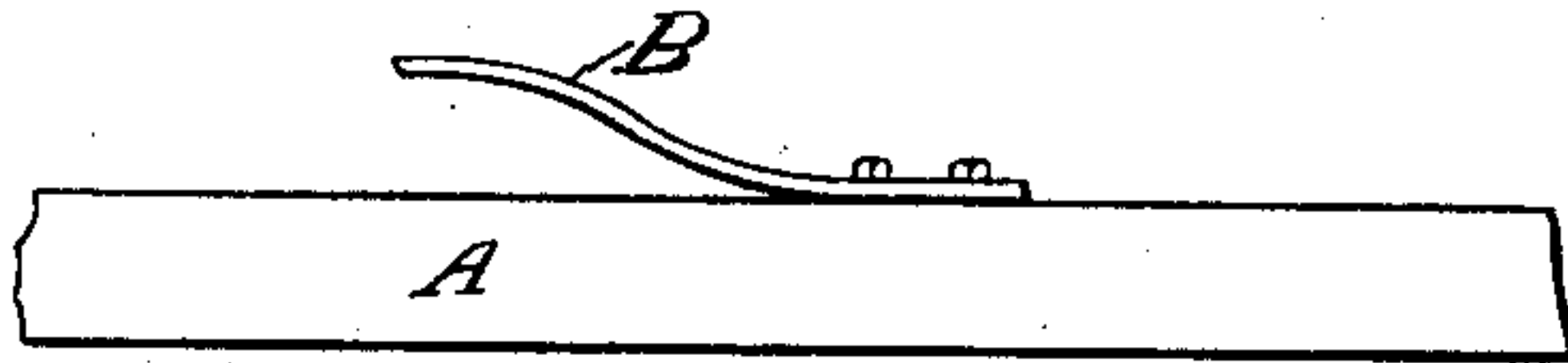


FIG. 8.

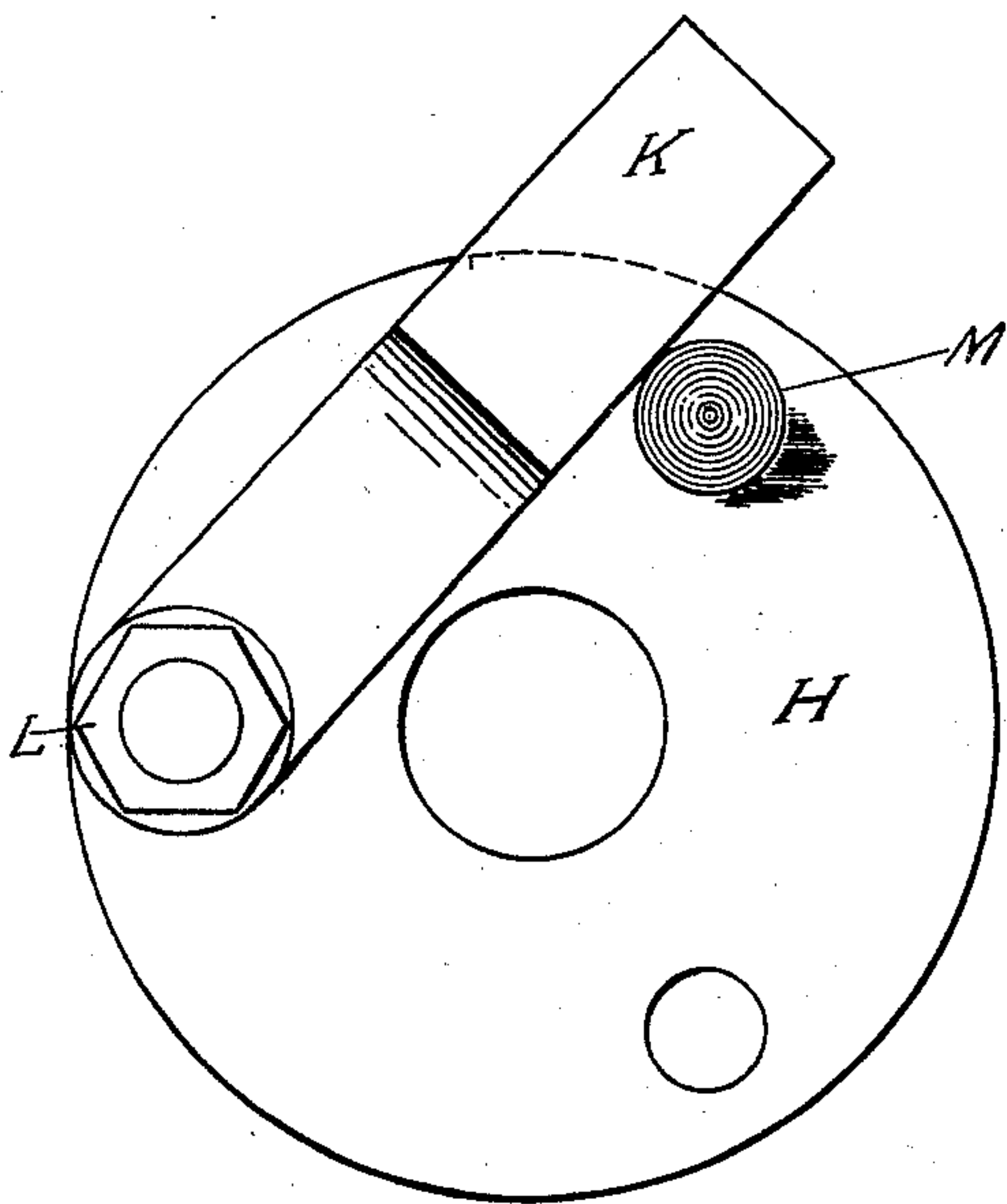
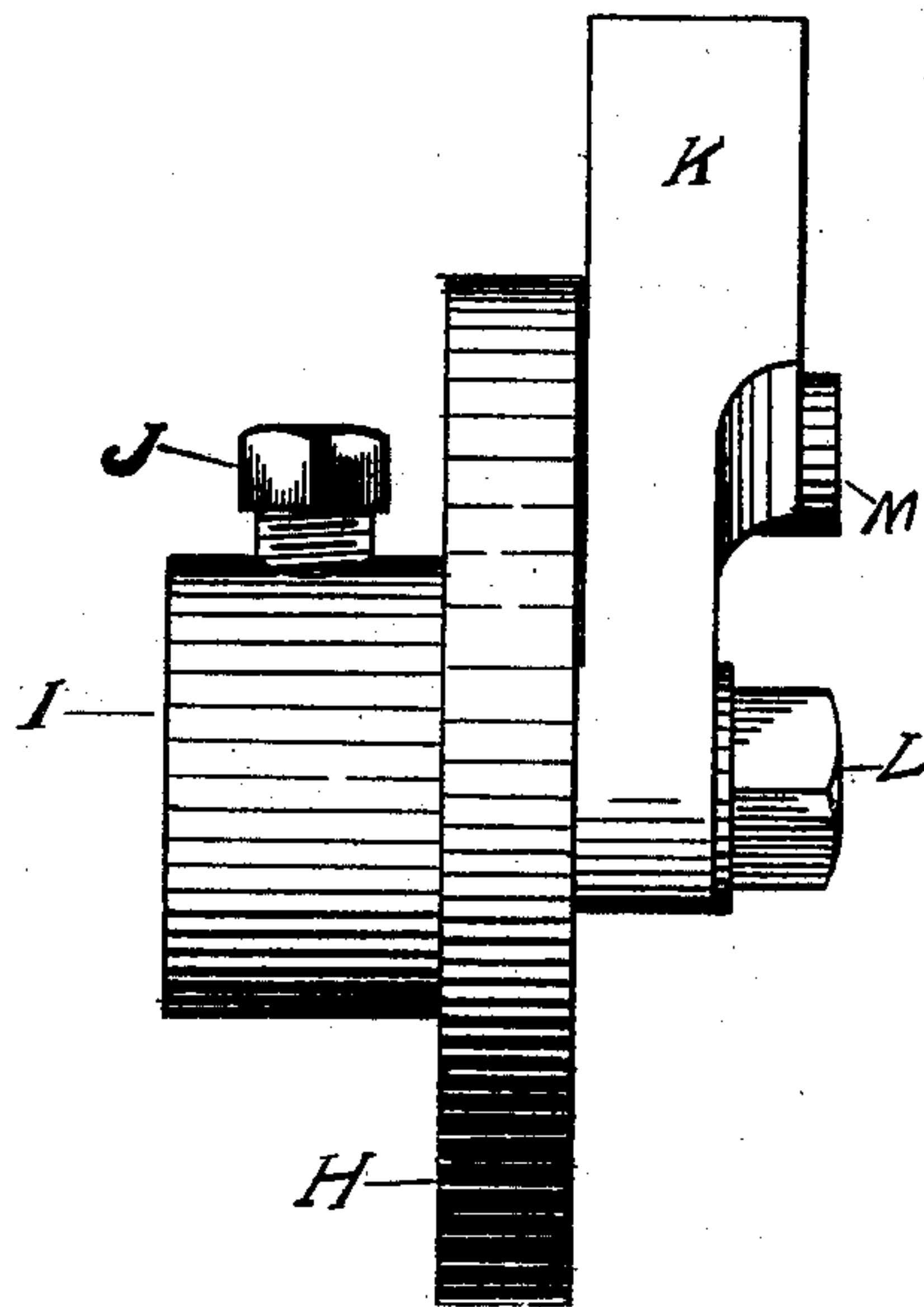


FIG. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLARD J. BELL, OF NEWAYGO, MICHIGAN.

VIBRATING SCREEN.

SPECIFICATION forming part of Letters Patent No. 754,839, dated March 15, 1904.

Application filed November 5, 1903. Serial No. 179,953. (No model.)

To all whom it may concern:

Be it known that I, WILLARD J. BELL, a citizen of the United States, residing at Newaygo, in the county of Newaygo and State of Michigan, have invented new and useful Improvements in Vibrating Screens, of which the following is a specification.

This invention relates to a new and useful vibrating screen used for screening gravel and other like material; and the invention consists, first, in combining with a spring-supported screen suitable means for giving a series of sudden impulses to the screen for the purpose of agitating the material placed thereon; second, in supporting a screen by means of springs so that the screen may be depressed by a stroke or impulse in any suitable manner; third, in supporting a screen upon springs, said screen being secured in a frame and the frame attached to the main supporting-frame by a flexible connection; fourth, in combining two screens, one placed above the other, securely attached together with supporting-springs, and suitable means for giving a series of impulses to agitate the material placed upon said screens.

The objects of my invention are, first, to furnish a screen for screening gravel and other like material which is agitated by a series of impulses, as is hereinafter described; second, to combine two screens supported in the same frame in such a manner that both screens may be agitated by the same series of impulses; third, other objects hereinafter described and claimed. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 shows a front elevation of a screen constructed in accordance with my invention, illustrating in a general way the arrangement of my preferred form of giving the impulses to the screens. Fig. 2 is a sectional view on line X X of Fig. 1, showing the arrangement of the two screens, one placed above the other, and what I term the "vibrating posts," which receive the impulses. Fig. 3 is a vertical sectional view, on an enlarged scale, of the upper part of the screen, taken on sub-

stantially the same line as is Fig. 2, showing the flexible attachment of the screen-frames to the supporting-frame. Fig. 4 is a sectional view through one of the vibrating posts, showing the position of the said post with reference to the screen-frames and screens. Fig. 5 is a front end view of the screen with the vibrating mechanism removed. Fig. 6 is a plan view of the supporting-frame which carries the springs, which springs in turn support the screen-frames. Fig. 7 is a detailed view of one of the supporting-springs attached to the frame. Fig. 8 is an elevation of one of the small disks which carry the operative hammers for giving the strokes or impulses to the screens, the figure showing the disk on an enlarged scale; and Fig. 9 is an edge elevation of the same parts shown in Fig. 8.

Similar letters refer to similar parts throughout the several views.

A represents the supporting-frame which carries the springs. This supporting-frame is placed upon an incline, preferably as shown in Fig. 2, and may be constructed and supported in any suitable manner. The supporting-springs are shown by B B, &c., placed upon the supporting-frame A, as shown in Figs. 2 and 6.

C C are the screen-frames supported upon the springs B B, &c., and also flexibly connected, by means of the attachment D, to the frame A, the attachment being shown in Figs. 2 and 3. In the drawings I have shown this attachment in the form of links; but any attachment may be used which contains flexibility.

E is the upper screen, which is preferably coarser than the lower screen, and F is the lower screen.

G G, &c., represent what I term "vibrating posts," each post being so attached to the screen-frames as to operate both screens simultaneously, and each post projects above the upper screen a sufficient distance to receive the impulse of the hammer or weight, hereinafter described.

H H, &c., show rotating disks, which in the form of my invention illustrated in the draw-

ings are mounted upon a series of shafts, (shown by P, N, and T,) the general position of these shafts and disks being fully illustrated in Fig. 1. Each disk is provided with a hub I, as shown in Fig. 9, the hub being provided with a set-screw J for adjusting the disk upon its shaft. Each disk also carries a hammer or weight K, which swings or turns upon a pivot L. The disk H is also provided with a projection or stop M, which as the disk revolves comes in contact with the hammer K, causing the same to be raised and carried over until it falls by gravity and strikes its corresponding vibrating post G. After striking the post the weight K is drawn in contact with the post and drops down, ready to be carried into a striking position, and the continued revolution of the disk H brings the weight into contact with the projection or stop M, which carries the weight up into position for another stroke. The disks by means of the adjusting-screw J may be adjusted into any required position upon the shafts, so as to give the strokes of the hammer or weight in any order required—that is, they can be arranged so that there will be one stroke at a time, the strokes falling fast upon the posts—or if it is required to give a stronger individual vibration to the screens the disks upon any one or more of the shafts may be arranged so as to fall simultaneously. The effect of the stroke upon the vibrating post is to depress suddenly the screen or screens to which the post is attached, which screen or screens are brought back to normal position by the springs which support the screen-frames from beneath.

In the example of my invention shown in the drawings I have illustrated three disk-bearing shafts, each shaft carrying three disks; but it will be understood that the number may be varied both as to the number of disks upon the shaft and as to the number of shafts to be used in connection with any one screen. The power for operating the disks may be taken from any suitable source.

In Fig. 1 I have illustrated a band-pulley O, placed upon the shaft P, which revolves the shaft P, the shaft P being provided with a sprocket-wheel Q, which is connected by a sprocket-chain Q' to a sprocket on the shaft N. The shaft N is provided also with a sprocket-wheel R, which is connected with a sprocket-chain R' to a sprocket-wheel S on the shaft T. I prefer to use a positive connection, such as a connection by sprocket-wheels and sprocket-chains, for the reason that this gives a uniform motion to all the revolving disks. Other means, however, may be used without departing from the spirit of my invention.

The material to be screened is fed through a suitable hopper or opening at the upper end, as shown in Figs. 2 and 3, and falls, in the first instance, upon the upper or coarser screen. Such as will not pass through the upper screen passes down to the bottom of the screen and is taken out in the ordinary manner, while such as passes through the upper screen and will not pass through the lower screen will be carried down upon the upper surface of the lower screen, while the material that passes through the lower screen will drop down beneath the lower screen or may be carried down upon any inclined surface, as required.

I prefer to construct my screen device with two screens, one placed above the other and both secured together, as above described; but, if desired, a single screen may be used in connection with the vibrating mechanism.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent, is—

1. In combination with a supporting-frame, a spring-supported screen, a plurality of revolving disks, each disk carrying a weight, and means for dropping the said weight upon the screen to produce a sudden downward movement against the action of the supporting-springs, for the purpose of agitating the material placed on said screen.

2. In combination with a frame, a spring-supported screen, a plurality of revolving disks, a weight carried by each disk, a stop on said disk, a pivot connecting the said weight to the disk, a stop on the disk for carrying the weight into a striking position, a plurality of vibrating surfaces or posts attached to the screen to receive the blow of the weight, whereby the screen is depressed by each stroke of said weight, substantially as described.

3. In combination with a screen-frame, a plurality of screens, one placed above the other and securely attached together, a plurality of springs supporting the said screens, a plurality of posts attached to the screen-frames, a plurality of revolving disks, each disk carrying a weight and means for giving an intermittent stroke upon one of the said posts, thereby suddenly depressing said screen.

4. In combination with a supporting-frame, a plurality of screens securely attached together, a plurality of vibrating posts carried by the screen-frame, a plurality of supporting-springs, a plurality of revolving disks, each disk carrying a weight which is dropped upon one of the said vibrating posts to suddenly depress the same for the purpose of agitating the screens, and a flexible connection between the screen-frame and the supporting-frame.

5. In combination with a spring-supported screen, a plurality of disks carried upon re-

volving shafts, each disk provided with a hub
and suitable means for adjusting the said disk
upon the shaft, a weight carried by each disk
and pivotally connected thereto, and a stop
5 carried by each disk for carrying the weight
into a striking position, substantially as de-
scribed.

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit-
nesses.

WILLARD J. BELL.

Witnesses:

EDWARD TAGGART,
MARY S. TOOKER.