

No. 612,721.

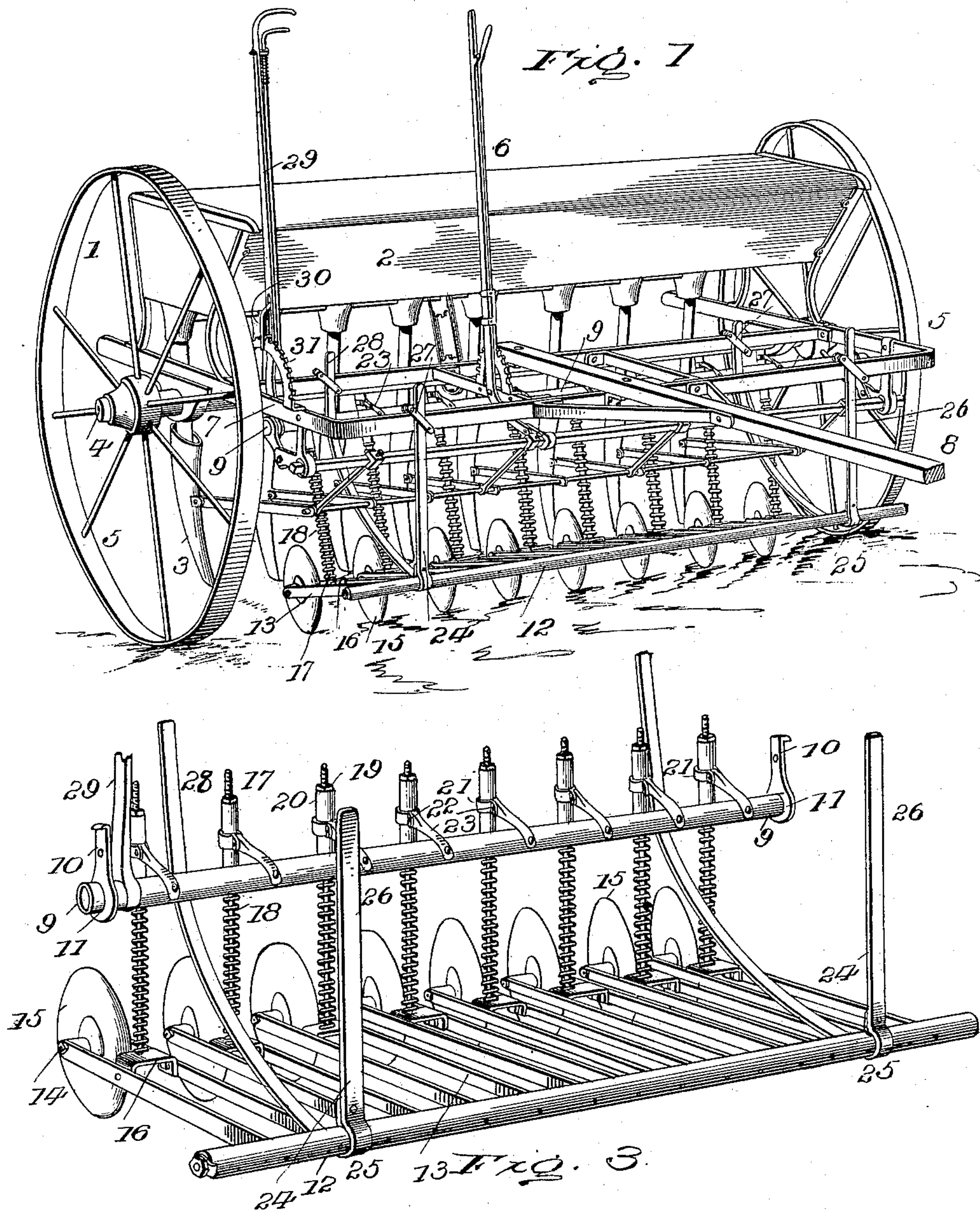
Patented Oct. 18, 1898.

B. F. HAVER.
GRAIN DRILL.

(Application filed Apr. 21, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses

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FIG. 2

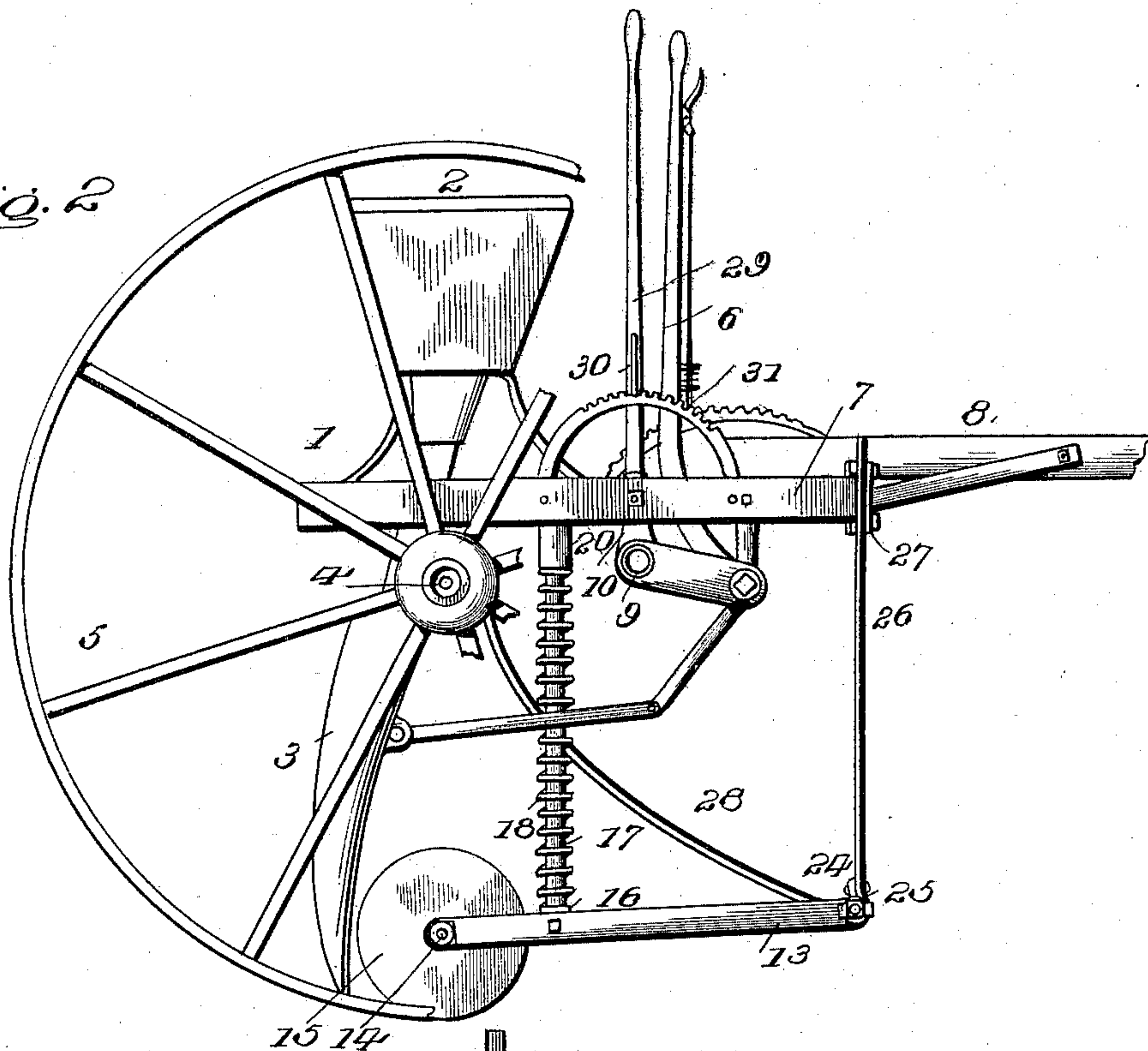
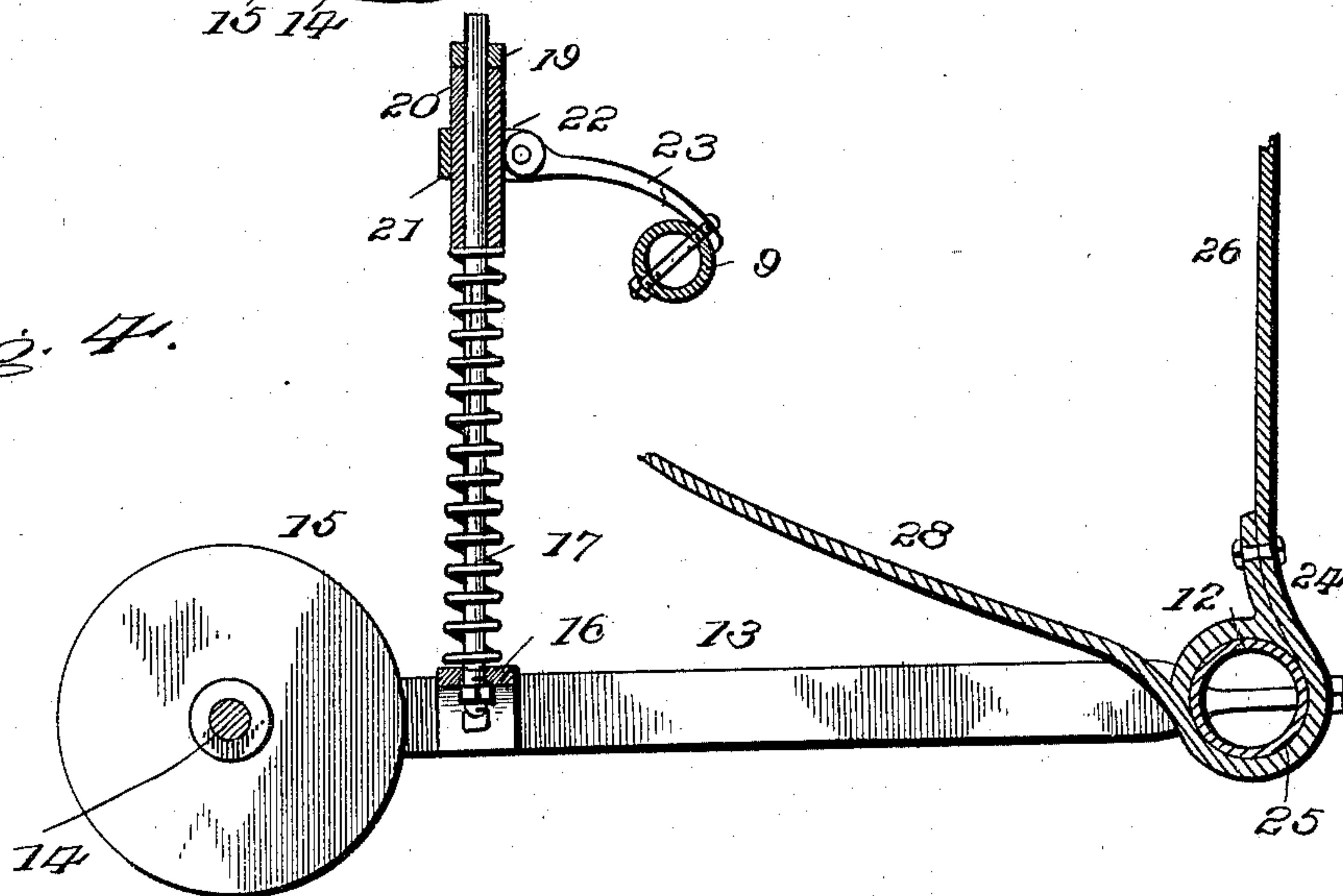


FIG. 4.



Witnesses

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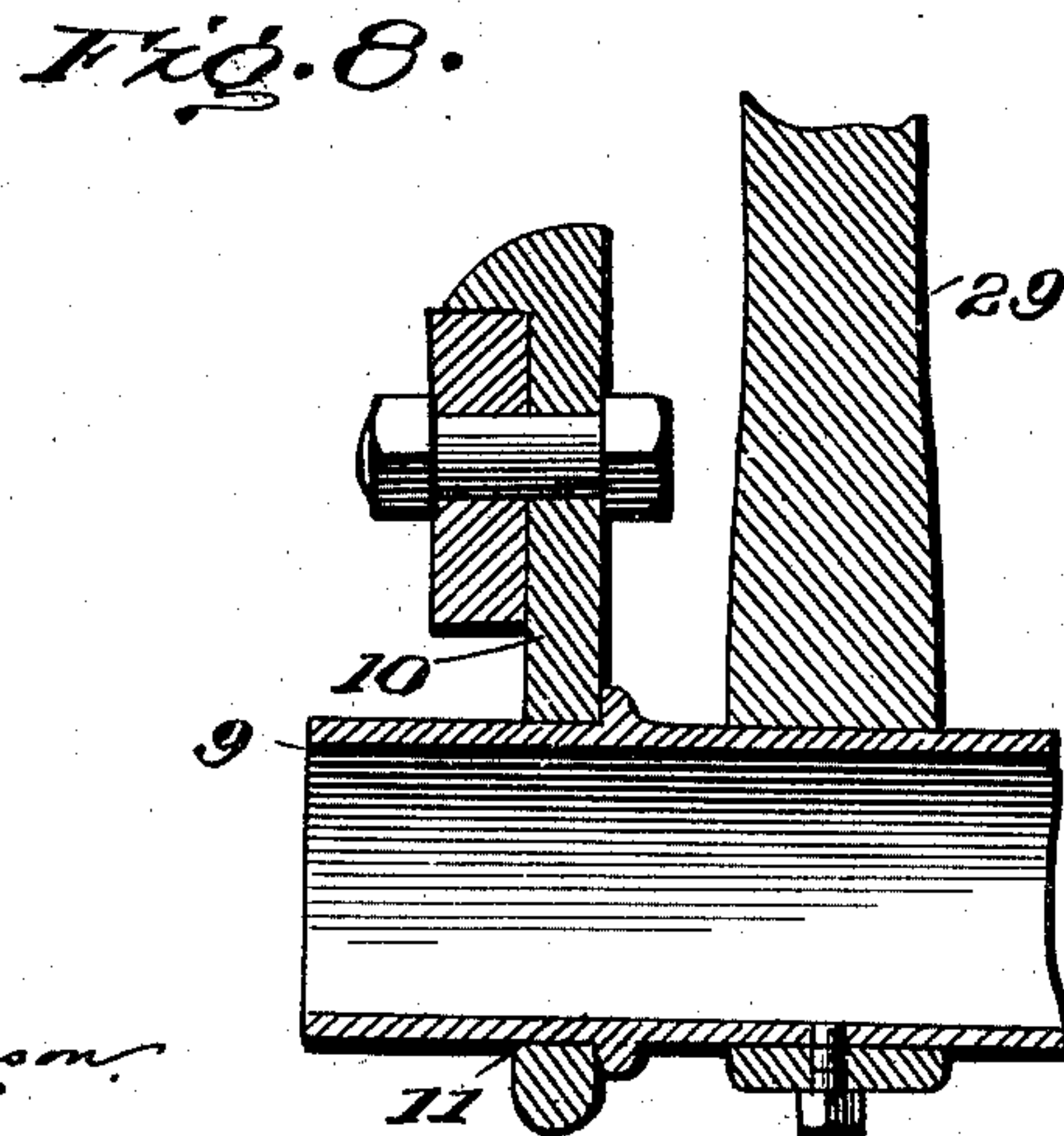
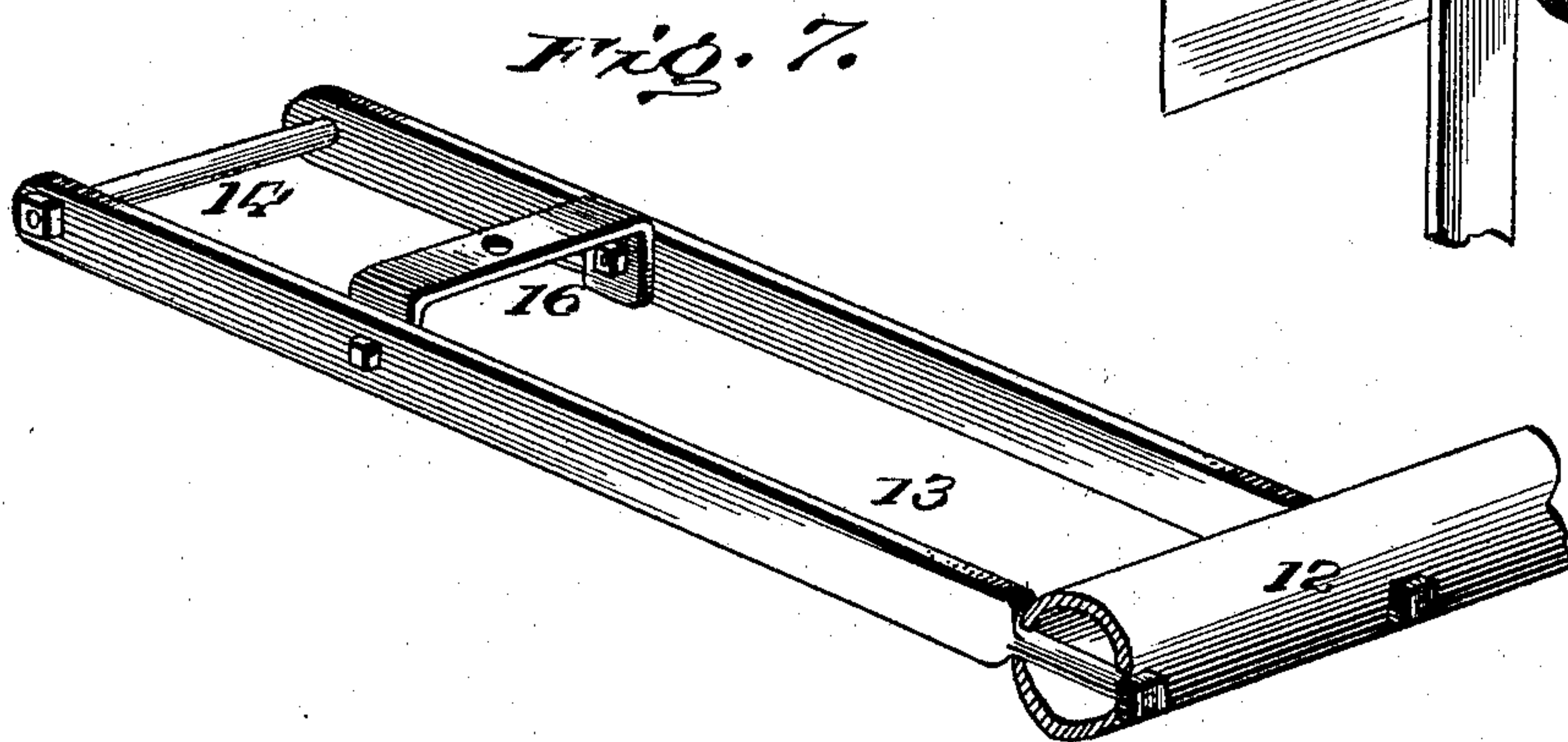
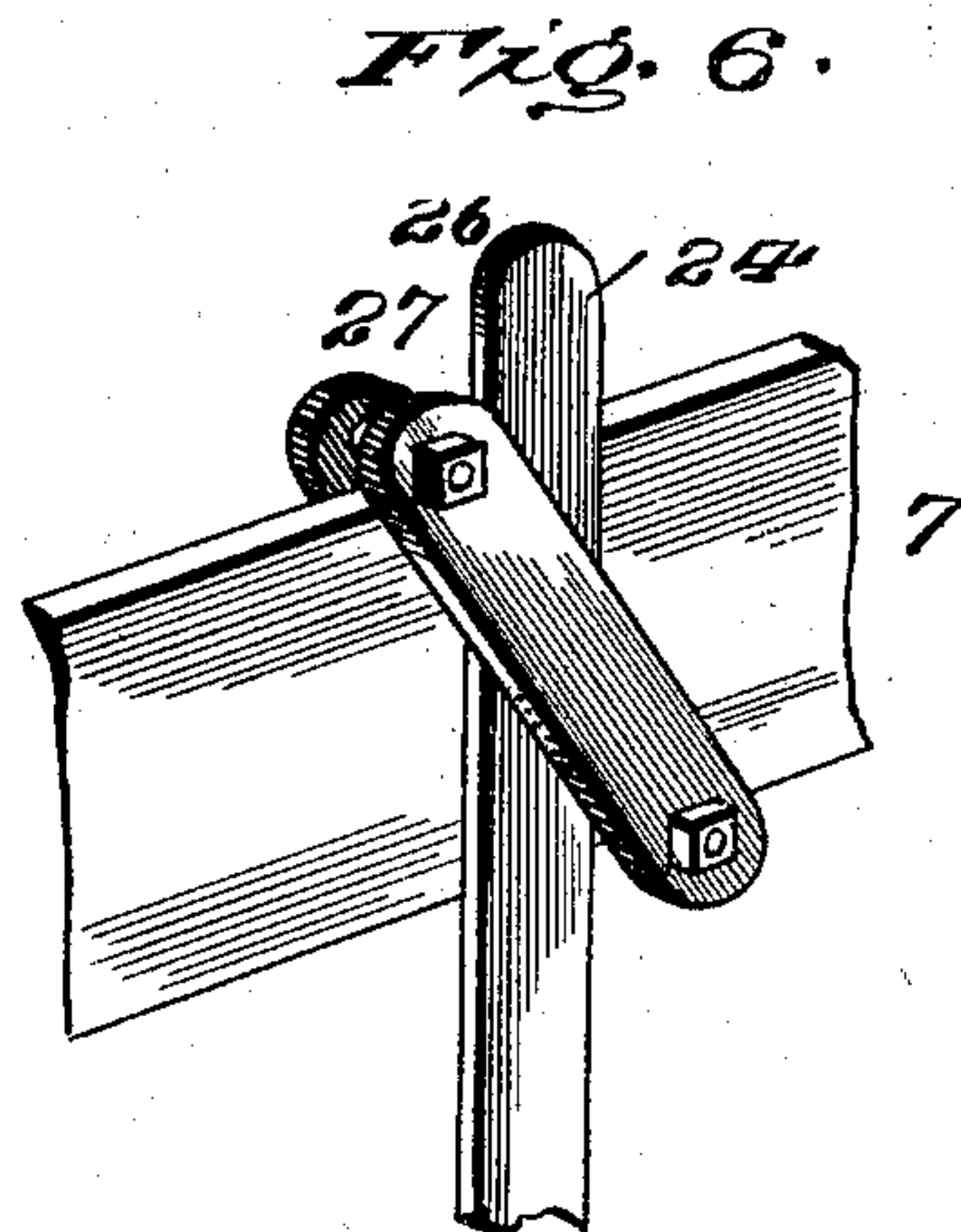
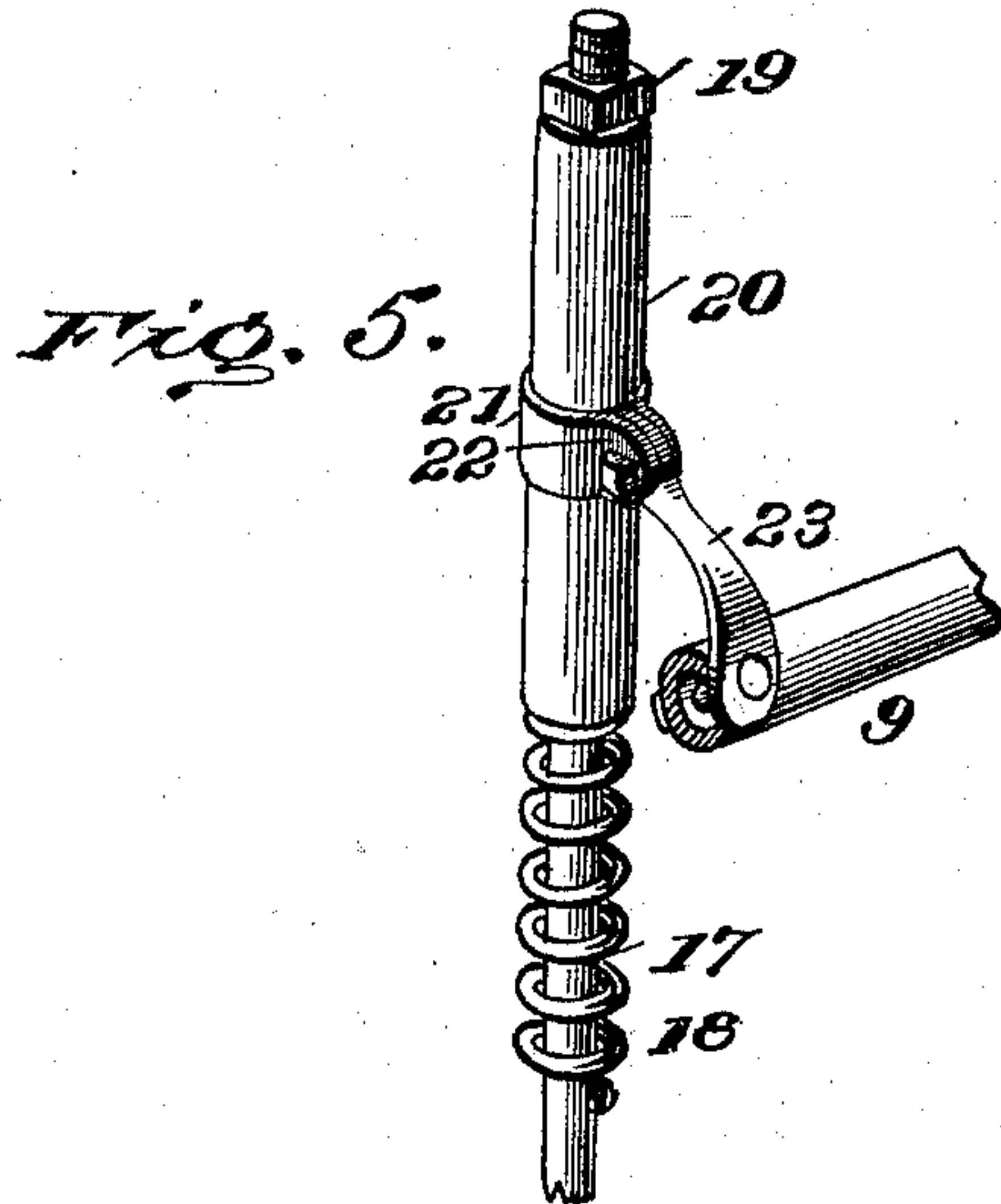
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. HAFFER, OF OKLAHOMA, OKLAHOMA TERRITORY.

GRAIN-DRILL.

SPECIFICATION forming part of Letters Patent No. 612,721, dated October 18, 1898.

Application filed April 21, 1898. Serial No. 678,419. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. HAFFER, a citizen of the United States, residing at Oklahoma city, in the county of Oklahoma and Territory of Oklahoma, have invented certain new and useful Improvements in Grain-Drills; and I 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.

This invention relates to grain-drills and the like; and it consists, essentially, of an attachment comprising a frame having yielding devices and rear disks independently rotatable and designed to lie in advance of the lower ends of the drill-boots or other seed-dropping tubes, the said attachment being adapted to be removably applied to any form of drill and elevatable when not in use by means independent of the devices controlling the depression or elevation of the said boots.

The invention further consists of the details of construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

The object of the invention is to facilitate the operation of a drill by forming seed-furrows in advance of the boot or tube ends and decrease the wear and tear on the latter and effectually break or cut up clods or lumps and provide a clean furrow for the deposition of the seed.

In ground having a natural fertility and readily-yielding characteristics a machine with the improved attachment can be employed in seeding without the customary preliminary preparation of the ground by plowing or otherwise breaking up and the distribution of fertilizers. If it is necessary to fertilize the ground, the attachment can be applied to a machine carrying a fertilizer-distributer, and while the attachment is shown and will be hereinafter described as combined with a drill it is intended to use it in connection with any other analogous machine or with agricultural machinery generally, to which it is adapted for operations demanding a device of this character.

In the accompanying drawings, Figure 1 is a perspective view of a drill, showing the improved attachment applied thereto. Fig. 2 is an end elevation of the drill and attachment. Fig. 3 is a detail perspective view of the im-

proved attachment on a larger scale. Fig. 4 is a transverse vertical section of the device as shown by Fig. 3. Fig. 5 is a detail perspective view of a part of one of the adjusting devices. Fig. 6 is a similar view of a part of one of the braces and means for holding it to the frame. Fig. 7 is a similar view of one of the pairs of parallel disk-arms. Fig. 8 is a detail section of the shifting-lever.

Referring to the drawings, wherein similar numerals of reference are employed to indicate corresponding parts in the several views, the numeral 1 designates a drill which may be of any preferred form and having a seed-box 2, dropping-tubes and adjustable boots 3, and an axle 4 with ground-wheels 5 thereon. A lever 6 is also attached to the drill for elevating or depressing the boots 3, and the frame 7 in the present instance is extended forward and of rectangular form. The tongue 8 is attached to the central part of the front of said frame, and the latter is so arranged as to properly equalize the draft and facilitate the application of the improved attachment, which will now be described.

An upper transversely-extending operating-bar 9 is provided, preferably of tubular construction, though a solid bar could be used equally well, and secured to the opposite ends of the front part of the frame 7 by bearing-clamps 10, which depend slightly below the said frame, and formed with lower apertured heads 11, in which said bar has rotary movement. Some distance below and in advance of the bar 9 a second outer transverse supporting-bar 12 is located, and extending rearward therefrom in a longitudinal direction are separate pairs of parallel arms 13, bolted through or otherwise secured to said bar 12 at their outer ends and apertured at their rear ends to receive the opposite ends of short spindles 14, on which disks 15 are loosely mounted and positioned between the arms, one disk being held by each pair of arms entirely independent of the adjacent or any other disk of the series. This individual arrangement of the disks allows them to run loose and all be capable of separate rotation for the purpose of obviating a drag by an obstruction engaging any one of the disks and also to accommodate turning the entire drill when it would be necessary for the outer disks or those gradually increasing in distance from the pivotal point of the machine in a

turning operation to revolve at different rates of speed. The said arrangement of the disks also makes it convenient in rectifying an irregularity in any one of the same without disturbing the others, or in the event of breakage the injured disk or spindle may be expeditiously removed and another substituted therefor. Furthermore, different kinds of disks can be employed, if desired, and replace those previously worked.

A transverse yoke 16 is secured to each pair of arms 13 and situated nearer the rear ends of the latter and serve as ties or reinforces and also as seats for the lower ends of vertical rods 17, surrounded by coil-springs 18, having their lower ends resting on said yokes. The rods 17 are immovably held by the yokes by being screw-threaded and engaged by nuts 19, turned down a suitable distance against the upper ends of sleeves 20, fitted on the rods and having their lower ends bearing on the upper ends of the springs 18. The sleeves 20 have clips 21 thereon and provided with ears 22, in which the rear ends of bracket-fingers 23, bolted at regular intervals to the operating-bar 9, are adjustably attached. The springs 18 exert a predetermined normal tension on the arms 13 and tend to throw the latter to their adjusted working position.

As a pivotal support for the attachment a pair of angle-braces 24 are applied to opposite parts of the same and have curved seats 25, in which the supporting-bar 12 has loose bearing. The front arms 26 of said braces extend upwardly at a rearward incline and are attached by clips 27 to the front of the frame 7. The rear arms 28 extend along between the adjacent pairs of arms 13 and then upward at an incline to the rear of said frame, where they are in like manner secured. By this means the entire attachment can be raised from or lowered to the ground to throw the disks out of working position when their use is not desired or depress the same when their utilization is required.

The lower end of a shifting-lever 29 is secured to one end of the operating-bar 9, and has a dog 30 thereon to coact with a toothed segment 31, located at one side of the drill-frame. The said lever extends upwardly within convenient reaching distance, and when thrown forward the disks are elevated from the ground. When thrown rearward a predetermined distance, the said disks are brought down to working position. To increase the downward pressure on the said disks, and consequently make them have a greater penetration in the ground, the said lever is drawn backwardly a greater extent than required for ordinary depression of said disks and a greater depth thereof is attained; also, in attaining this greater-depression adjustment the springs 18 are caused to bear with increased tension on the arms 13 as the sleeves 20 are forced downward thereon over the rods 17 by the fingers 23.

Some purposes of the attachment have heretofore been disclosed; but as a harrowing device it is exceptionally efficient. Further, the rapidity and facility of articulation or dissemblage of the several devices and the simplicity of construction provide for easy setting up and application for use or detachment and dismemberment for storage in a compact form without requiring mechanical skill or ingenuity to attain the desired result; also, changes in the proportions, dimensions, and details of construction can be resorted to without in the least departing from the nature of the invention or sacrificing any of the advantages thereof.

Having thus described the invention, what is claimed as new is—

1. In combination with a drill having a front overhanging frame and a series of boots, of an upper operating-bar located under the rear part of said frame, bearing-clamps depending from said frame in which said bar is rotatably mounted, a supporting-bar normally adjacent the ground-surface in advance of the said operating-bar and in a plane parallel with that of the latter, a series of separate pairs of straight horizontally-disposed arms extending rearwardly from the said supporting-bar each pair having a removable spindle connecting their rear ends, disks rotatably mounted on said spindles, yokes connecting each pair of arms and located near the rear ends of the latter, vertical rods attached to said yokes, sleeves movably mounted on said rods, springs surrounding the rods between the yokes and lower ends of the sleeves, clips secured to said sleeves, bracket-fingers movably attached to said sleeves at their rear ends and rigidly secured to the operating-bar at their front ends, a lever attached to said operating-bar for rotating the same, and a lever for elevating and lowering the entire attachment.

2. In combination with a drill having a frame and a series of boots, of an upper operating-bar, a supporting-bar in advance of and below said operating-bar, a series of horizontal arms extending rearwardly from the said supporting-bar and below and under the operating-bar and carrying independent rotatably-mounted disks between their rear ends, yielding connections between the arms and the operating-bar, and a pair of angle-braces having curved seats in which said supporting-bar has loose bearing, the front arms of said braces extending upwardly and having their ends attached to the drill-frame, and the rear arms extended along between adjacent pairs of said arms and then upward at an incline to the rear of said drill-frame where they are secured.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN F. HAFFER.

Witnesses:

R. F. CAFFREY,
ANNA G. CAFFREY.