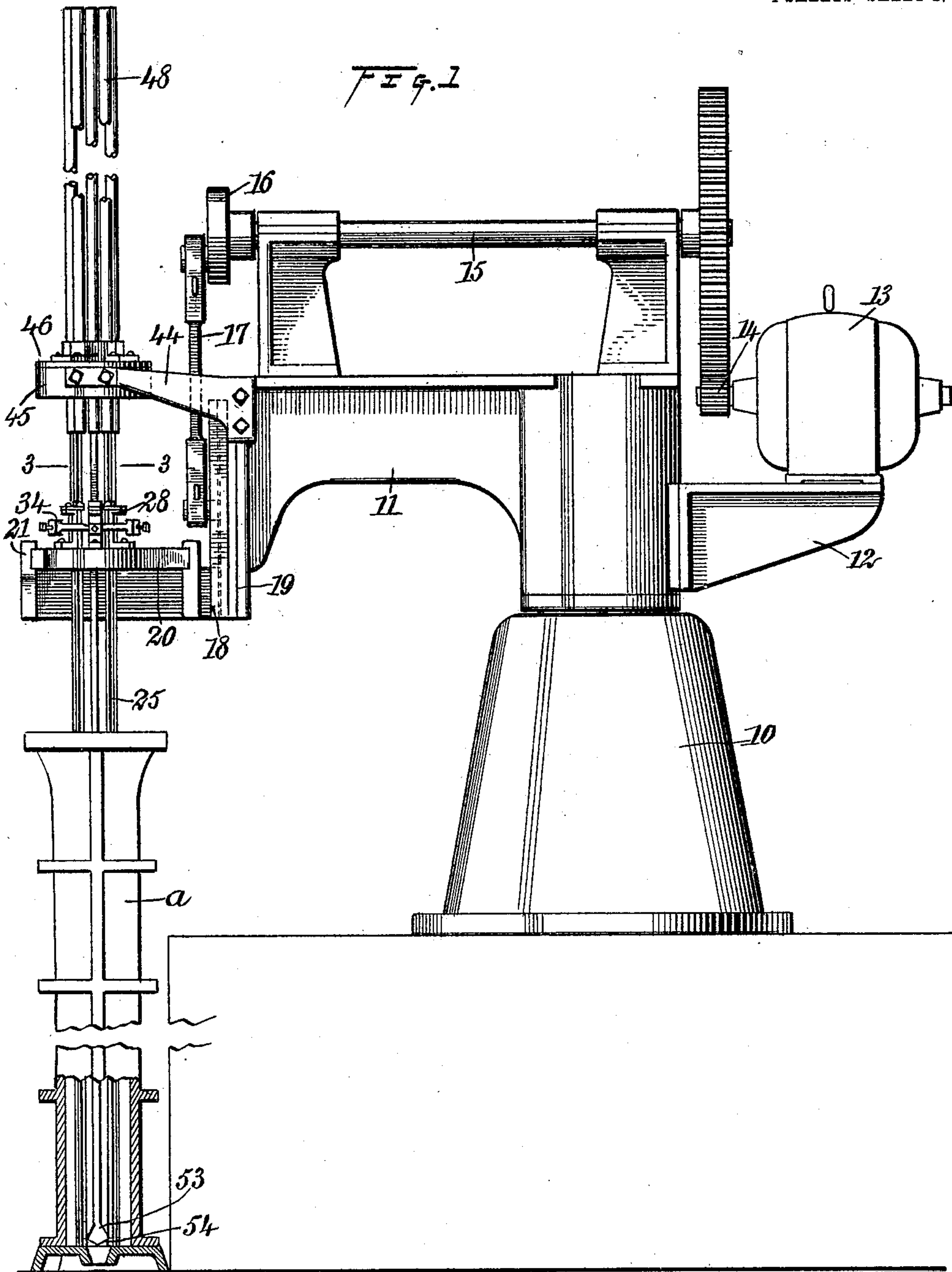


No. 820,253.

PATENTED MAY 8, 1906.

J. POULSON.  
MOLD RAMMING MACHINE.  
APPLICATION FILED JUNE 12, 1905.

4 SHEETS—SHEET 1.



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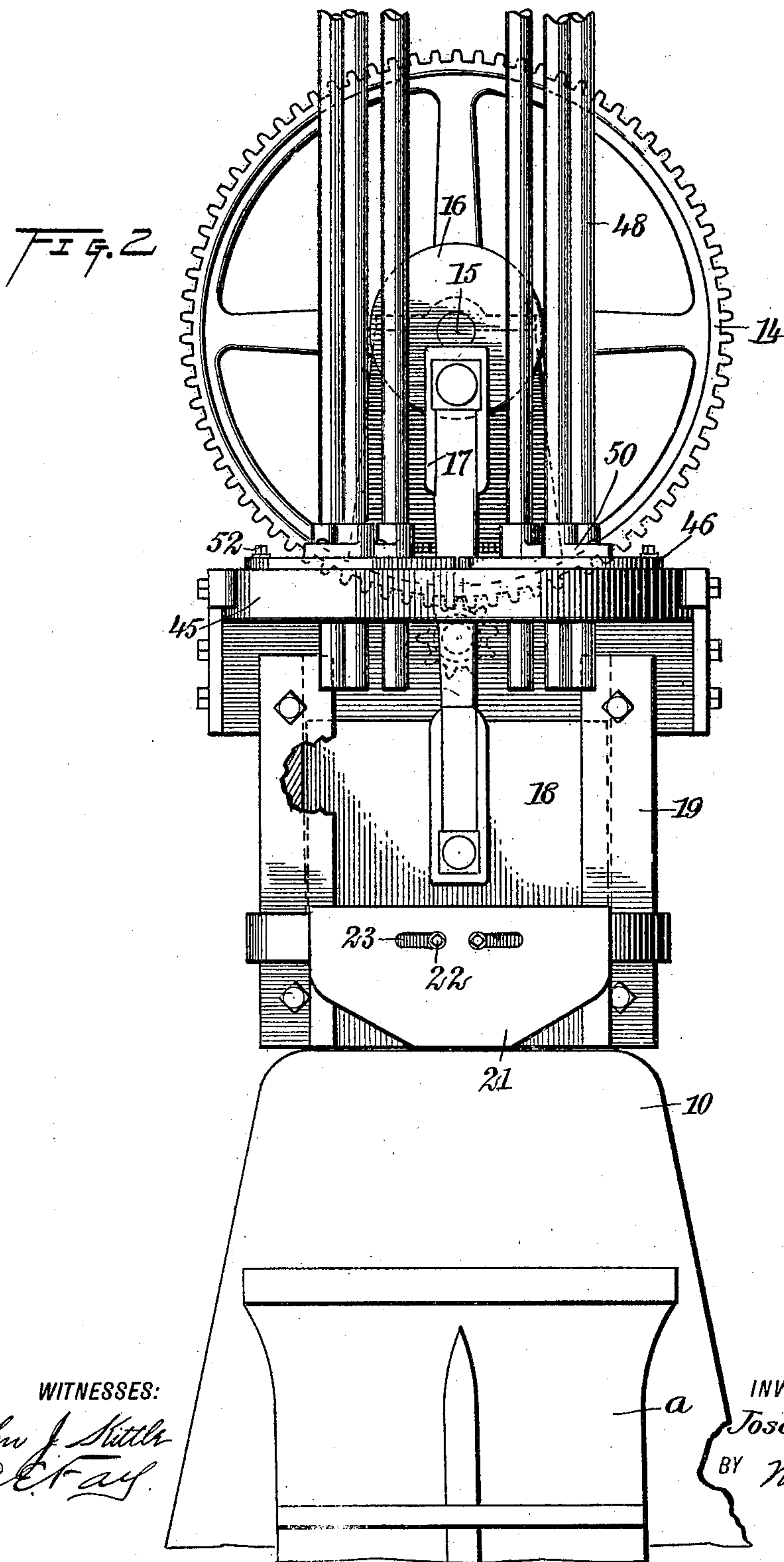
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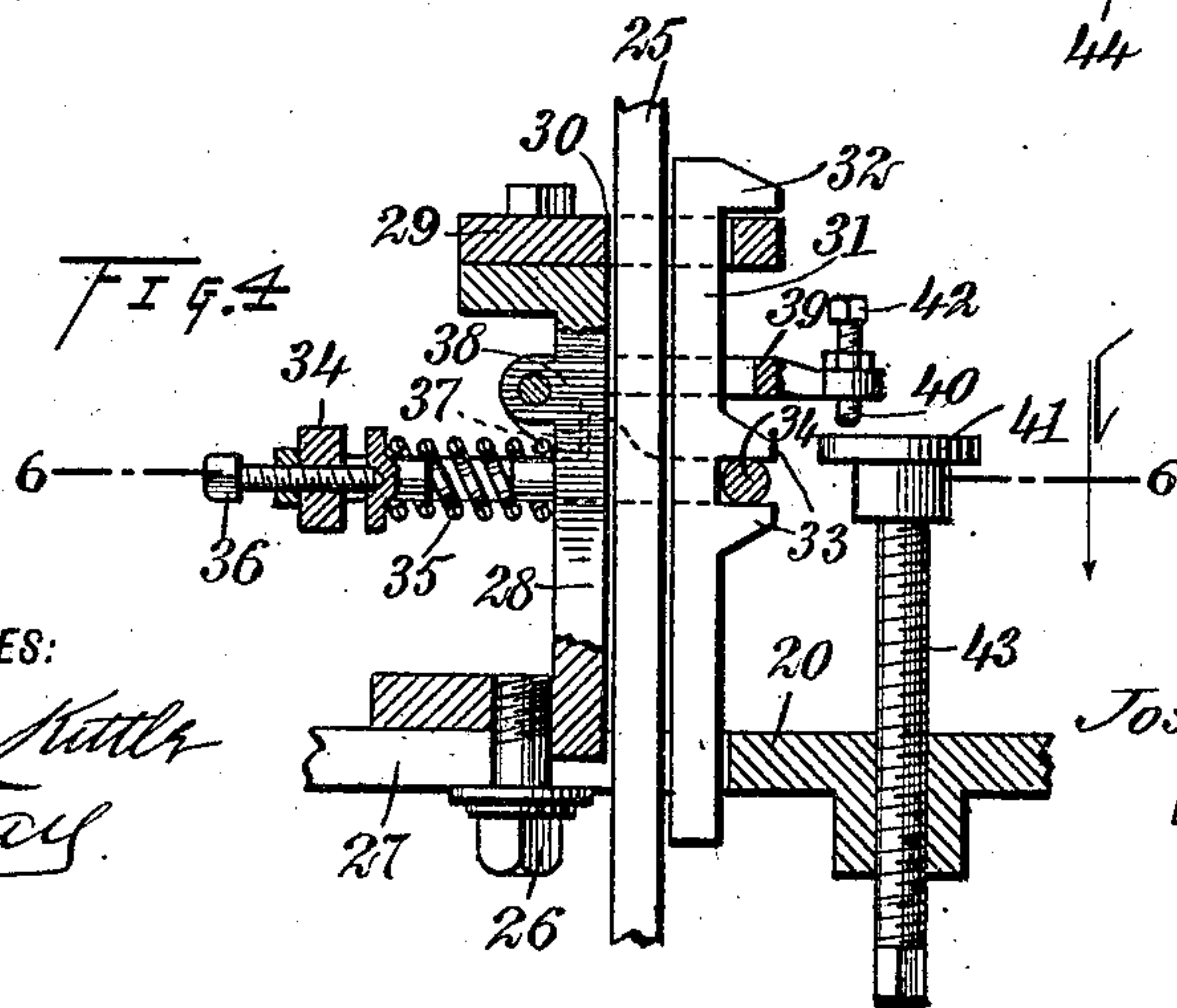
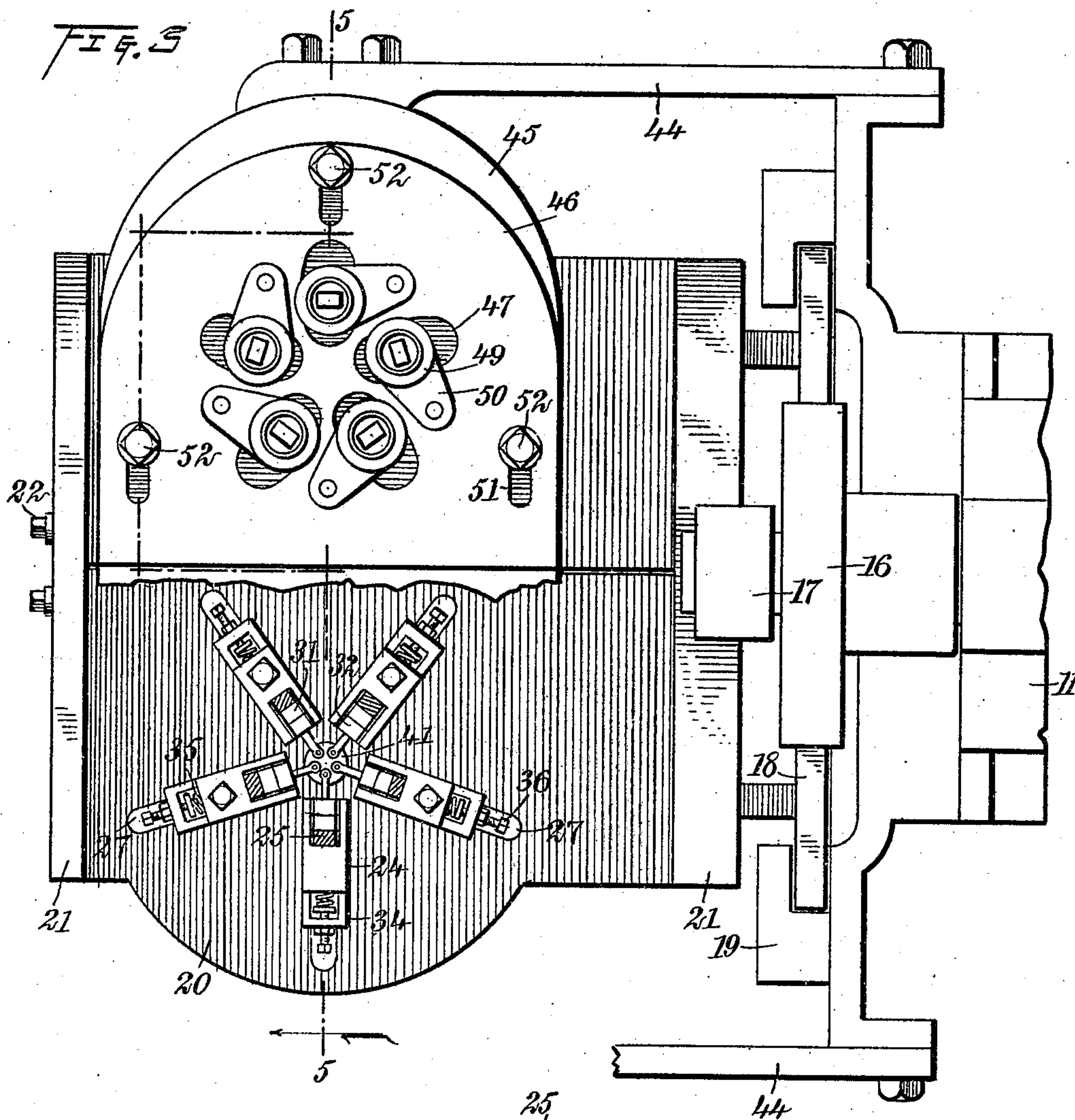


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4 SHEETS—SHEET 3.



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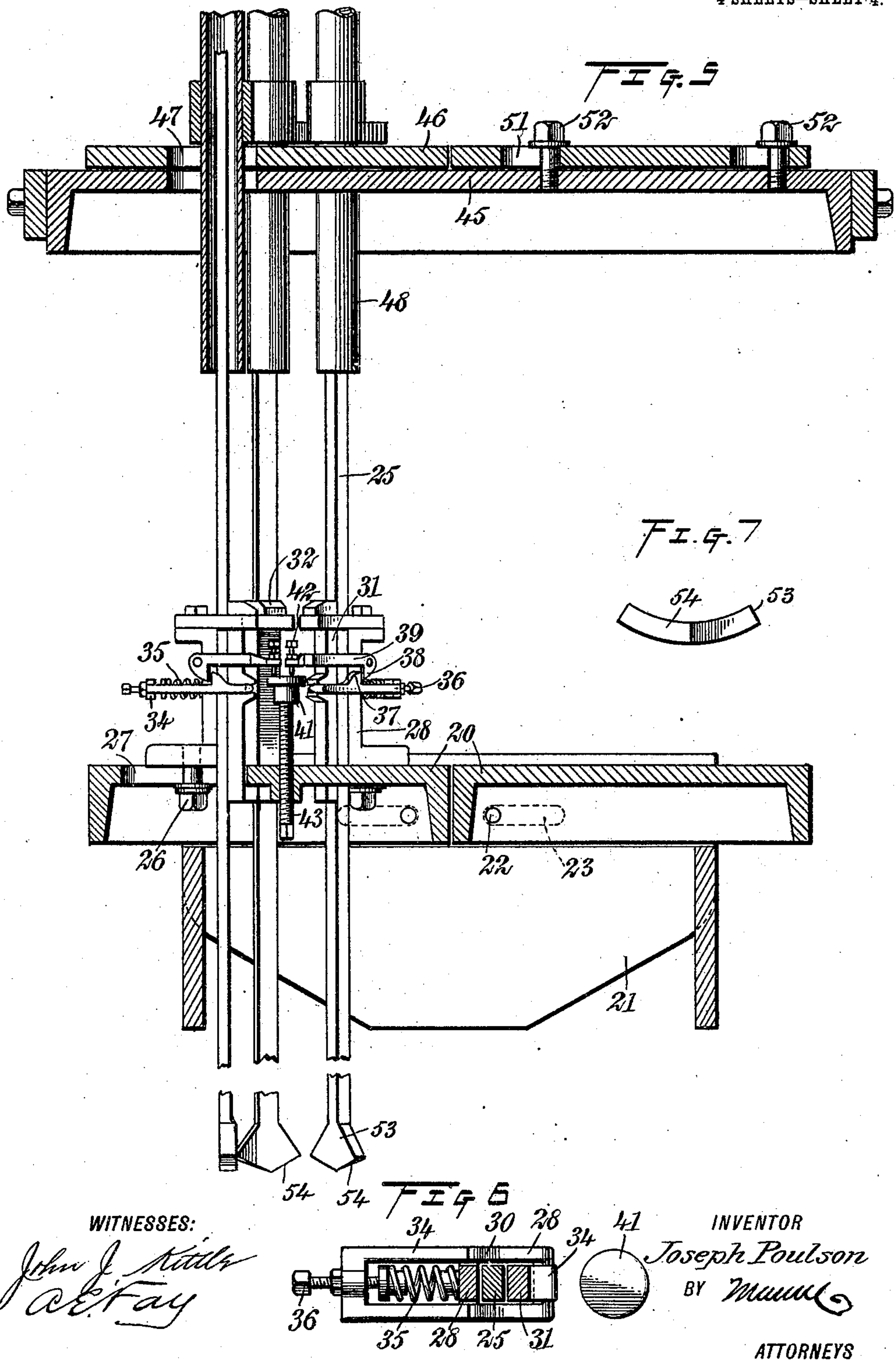
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4 SHEETS—SHEET 4.





# UNITED STATES PATENT OFFICE.

JOSEPH POULSON, OF PHILLIPSBURG, NEW JERSEY.

## MOLD-RAMMING MACHINE.

No. 820,253.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed June 12, 1905. Serial No. 264,900.

*To all whom it may concern:*

Be it known that I, JOSEPH POULSON, a citizen of the United States, and a resident of Phillipsburg, in the county of Warren and State of New Jersey, have invented a new and Improved Mold-Ramming Machine, of which the following is a full, clear, and exact description.

My invention relates to a machine for ramming molds, and while capable of use for molding in general it is especially adapted for foundry-work, and particularly for that class of foundry-work in which vertical pipe-molds are employed. It is adapted to ram one such mold or a larger number and is capable of use in making all kinds of molds of this character.

One of the principal objects of the invention is to provide for reciprocating a series of rammers in such a manner that they will be picked up by the reciprocating device and elevated to the desired height and that when forced against the sand in the mold the rammers will be shortened, or, in other words, the distance between the lifting means and the bits of the rammers will be decreased, so that as the sand rises in the mold the rammers will be in such condition that they will at all times give a strong blow upon the top of the sand and will ram the sand with evenness throughout the length of the mold.

Further objects of the invention are to provide a yielding gripping device for assisting in the operation described above, to provide various adjustments for the rammers in order to permit the ramming of a plurality of molds at different distances apart on the centers, to provide for guiding the rammers, and to improve the form of the bits of the rammers, so that they may more efficiently pack the sand in the mold.

Additional objects will appear below.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a mold-ramming machine, showing the principle of my invention, a portion of the mold being operated upon appearing in section. Fig. 2 is a front elevation of the same on an enlarged scale. Fig. 3 is a plan with one side of the device appearing in section on the line 3-3 of Fig. 1. Fig. 4 is a vertical sectional view, on

an enlarged scale, of a gripping device constituting a part of the invention. Fig. 5 is a sectional view on the line 5-5 of Fig. 3. Fig. 6 is a sectional view on the line 6-6 of Fig. 4, and Fig. 7 is a bottom view of a ramming-bit.

The machine is pivotally mounted upon a base 10, so that the arm 11, which supports most of the working parts, can swing about the base to the desired position. On a bracket 12 is located a motor 13, connected, by means of gearing 14, with a shaft 15. This shaft is provided with a crank 16. By means of a connecting-rod 17 the crank operates a slide 18 to give it vertical reciprocation in ways 19 on the arm 11. Upon this slide is rigidly mounted a plate 20, which I call the "gripping-plate." This plate is preferably in two or more parts, and these parts are adjustable in horizontal ways 21, secured to the slide 18. The parts of the gripping-plate are secured in any desired position on these ways by means of screws or bolts 22, passing through elongated slots 23 on the outer ways 21. The purpose of providing for this adjustment is to permit the device to be used with different flasks. The flasks with which this machine is ordinarily used are in the form of vertical cylinders *a*, of different sizes, according to the diameter of the pipe to be molded. These flasks are usually set up in pairs, and it will be readily understood that the larger the pipe to be molded the greater is the distance between the centers of the two flasks, which are mounted upon the same base *b*, and consequently the plates 20 are adjusted toward and from each other in order that their centers may correspond with the centers of the flask. Although I have illustrated the device only as being used for double flasks, it will be readily understood that the same principle is applicable when the flasks are put up in threes or larger numbers.

The purpose of the gripping-plates is to support gripping devices 24 for holding rammers 25. These gripping devices are secured to the gripping-plates by means of bolts or screws 26, passing through radial elongated slots 27, so that they can be radially adjusted to any desired position in order that the rammers may enter the flasks at the proper position and form a circle about the pattern in the flask. Each gripping device comprises a frame 28, having a top plate 29, provided with an opening 30 for the ram-



mer and for a clamping-bar 31. The rammer and clamping-bar also pass through the slot 27 below. The clamping-bar is provided with a nose 32, adapted to rest upon the top plate 29 and hold it in position. It is also provided with a pair of projections 33, having a space between them for receiving a clamping member 34, which passes around the frame 28 and is provided with a spring 35 for forcing the clamping member 31 against the rammer. A screw 36 is also provided for exerting pressure upon the spring 35 and regulating the tension with which the clamping-bar 31 is forced against the rammer. The clamping member 34 is provided with a tooth 37, with which engages a tooth 38 upon a lever 39. This lever is pivoted upon the frame 28 and extends forwardly therefrom. It is provided with a point 40, which is adapted to be engaged by a plate 41 for adjusting it. This point is preferably formed by the lower end of a screw 42, mounted in the end of the lever and capable of being turned so as to adjust the position of the point. The plate 41 is mounted upon a screw 43, which passes through the central portion of the plate 20. It will be understood that all these parts are duplicated upon the other half of the plate. The plate 41 is adapted to engage all the points 40, one of which is connected with each gripping device, and it will be seen that the raising of this plate will cause all of the projections 38 to engage the projections 37 and force the clamping members 34 away from the rammers 25, so as to release them and allow them to drop through the clamping devices, while the lowering of the plate 41 will reverse this operation and permit the springs 35 to operate in the normal manner and force the clamping-bars 31 against the rammers, so as to hold them in position under the tension of the spring.

Upon the arm 11 are mounted brackets 44, which support a plate 45 directly over the plates 20. This plate is provided with a pair of plates 46, having a series of radial slots 47 for receiving a series of guide-tubes 48 for the rammers. These guide-tubes are capable of adjustment along the slots 47, so as to register with the rammers and guide them. Each tube is provided with a collar 49, having an arm 50, extending at an angle to the slot 47, in which the tube is located. By means of these arms the tubes are adjusted in the slots as desired. Each plate 46 is also provided with a series of slots 51 and is secured to the plate 45 by means of screws or bolts 52, passing through these slots and providing for adjustment of the plates 46. The rammers are provided with curved bits 53, having slanting lower surfaces 54, and are so arranged as to perform a continuous ramming effect around the pattern. The formation of the bits is such as to exert force both sidewise and downward upon the blow being deliv-

ered, which provides for a thorough packing of the sand in the space between the flask and the pattern.

The operation of the machine is as follows: The flask or flasks containing the patterns are placed in position and the swinging arm revolved around the base until the ramming-bars are in central position directly over the flasks. If there are two or more flasks on one base, the plates 20 and 46 are so adjusted as to provide for the centering of the ramming-bars over each flask. It will be understood that during this time the ramming-bars are held in elevated position by the force of the clamping-bars 31, applied by means of the springs 35. By tightening up the screw 43 the plate or disk 41 engages all the points 40 on each half of the gripping-plate, and the levers 39 are lifted, so as to force the clamping member 34 outwardly and release the ramming-bars. They consequently drop to the bottom of the flasks. The screw 43 is then loosened and the plate 41 lowered, so as to permit the spring to exert a pressure upon the clamping-bar 31 and normally hold the ramming-bars on the clamping-plates. Sand is then thrown into the top of the flask and falls under the ramming-bars. The machine being started up, the plate 20 is reciprocated, and upon its upward stroke it carries the ramming-bars with it on account of the force of the spring 35. On the downstroke also it carries the ramming-bars; but when they strike the sand they are allowed to slip between the frames 28 and clamping-bars 31 on account of the resiliency of the spring 35. They give a sharp blow to the sand, however, and ram it in an effective manner; but on account of the slip caused by the yielding of the spring they are shortened, or rather the bits are moved normally toward the clamping-plate, so that upon the next stroke, more sand being admitted, they will not reach so far into the mold.

It will be seen that by this construction the height of sand in the mold at the time when one stroke is delivered regulates the position of the ramming-bits and provides for their giving a blow to any sand admitted afterward, but prevents the upper part of the mold being rammed harder than the lower part, which would be the case if the stroke were the same at all times. When the flask has been filled and the ramming-bars have been forced to its top, the flask can be removed and the machine swung around to a position to ram other molds. The molds can be arranged in a circle around the machine and readily rammed one after another in this manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of a frame, a clamp-



ing-bar thereon, a clamping member engaging said clamping-bar and adapted to force the same toward the frame, and means for regulating the pressure exerted by the clamping member on the bar.

2. The combination with a ramming-bar, of a gripping device, comprising a frame, a clamping-bar mounted on said frame and adapted to engage the ramming-bar, a clamping member connected with said clamping-bar and means for forcing the clamping member toward the clamping-bar.

3. The combination with a series of ramming-bars, of a series of gripping devices each comprising a frame, a clamping-bar mounted on said frame and adapted to engage a ramming-bar, a clamping member connected with said clamping-bar, and resilient means for forcing said clamping member toward the clamping-bar to secure the ramming-bar in position upon the gripping device.

4. The combination of a frame, a clamping-bar mounted thereon, a clamping member engaging said clamping-bar and adapted to force it toward the frame, a spring for operating said clamping member, means for adjusting the tension on said spring, and means for overcoming the tension of the spring.

5. The combination of a frame, a clamping-bar mounted thereon, a clamping member engaging said clamping-bar and adapted to force it toward the frame, a spring for operating said clamping member, means for adjusting the tension on said spring, and means for overcoming the tension of the spring; said last-named means comprising a pivoted lever having means for engaging said clamping member, and means for moving said lever.

6. The combination of a gripping-plate having a series of perforations therein for ramming-bars, a gripping device located adjacent to each of said perforations, said gripping devices each comprising a clamping member, a spring for operating said member, a projection on said member, a pivoted lever having a projection adapted to engage the first-mentioned projection and overcome the force of said spring, and an adjustable contact-point located upon said lever, with a screw mounted upon said gripping-plate, and a plate or disk on said screw in position to engage all of said contact-points.

7. The combination of a gripping-plate having a perforation therein for a ramming-bar, and a gripping device located adjacent to said perforation; said gripping device comprising a clamping member, a projection on said member, a lever having a projection adapted to engage the first-mentioned projection, a screw mounted upon the gripping-plate, and a plate or disk on said screw in position to engage said lever.

8. The combination of a frame, a clamping-bar mounted thereon, a clamping member engaging said clamping-bar and adapted

to force it toward the frame, a lever having means for engaging the clamping member, and means for moving said lever to disengage the clamping member from said bar.

9. A molding-machine having a gripping-plate in sections adjustable toward and from each other, each section having means for supporting rammers.

10. The combination of a gripping-plate in sections adjustable toward and from each other, a series of gripping devices on each section for holding rammers, a series of guide-plates mounted above said gripping-plates, means for adjusting the guide-plates toward and from each other, and a series of guides mounted upon each guide-plate and adapted to register with the gripping devices.

11. The combination of a gripping-plate in sections adjustable toward and from each other, a series of gripping devices on each section for holding rammers, and means for adjusting the gripping devices toward and from each other.

12. The combination of a gripping-plate in sections adjustable toward and from each other, a series of gripping devices on each section for holding rammers, a series of guides for the rammers, and means for adjusting the guides toward and from each other.

13. The combination of a gripping-plate in sections, means for adjusting said sections toward and from each other, a series of plates above said sections, means for adjusting said last-named plates toward and from each other, and a series of guides located on said last-named plates.

14. The combination of a gripping-plate in sections adjustable toward and from each other, a series of gripping devices on each section for holding rammers, means for adjusting the gripping devices toward and from each other, a series of guide-plates mounted above said gripping-plates, means for adjusting said guide-plates toward and from each other, and a series of guides mounted upon each guide-plate and adapted to register with the gripping devices, said guides being radially adjustable upon the guide-plates.

15. The combination of a gripping-plate in sections adjustable toward and from each other, a series of gripping devices on each section for holding rammers, means for adjusting the gripping devices toward and from each other, a series of guide-plates mounted above said gripping-plates, means for adjusting said guide-plates toward and from each other, a series of guides mounted upon each guide-plate, and means for reciprocating the gripping-plates and rammers.

16. The combination of a gripping-plate in sections adjustable toward and from each other, a series of gripping devices on each section for holding rammers, means for adjusting the gripping devices toward and from each other, and a rammer connected with each



gripping device; said rammers being arranged in a circle and each rammer having bits provided with slanting sides.

17. The combination of a gripping-plate in 5 sections adjustable toward and from each other, a series of gripping devices on each section for holding rammers, and a rammer connected with each gripping device; said rammers being arranged in a circle.

18. The combination of a gripping-plate in 10 sections adjustable toward and from each other, a series of gripping devices on each section for holding rammers, a series of guide-

plates mounted above said gripping-plates, means for adjusting said guide-plates toward 15 and from each other, a series of guides mounted upon each guide-plate, and means for reciprocating the gripping-plates and rammers.

In testimony whereof I have signed my name to this specification in the presence of 20 two subscribing witnesses.

JOSEPH POULSON.

Witnesses:

JACOB S. STEWART,  
J. I. BLAIR REILEY.