

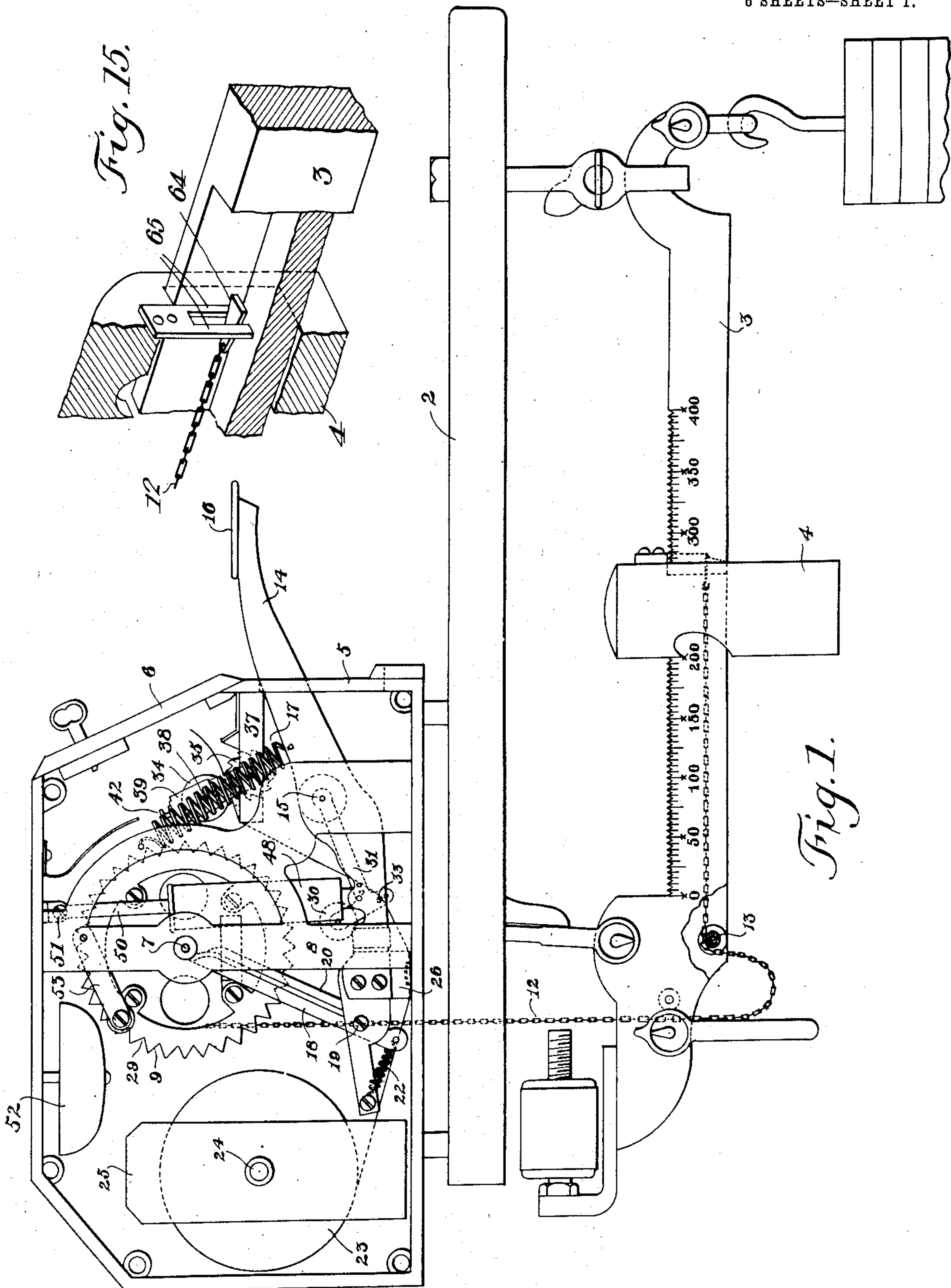
No. 812,286.

PATENTED FEB. 13, 1906.

E. McGARVEY.
MECHANICAL RECORDING SCALE.

APPLICATION FILED MAY 31, 1904.

6 SHEETS—SHEET 1.



Witnesses:
E. V. Mackenzie
Watson Large

Inventor.
Edward McGarvey
by C. M. Clarke Atty

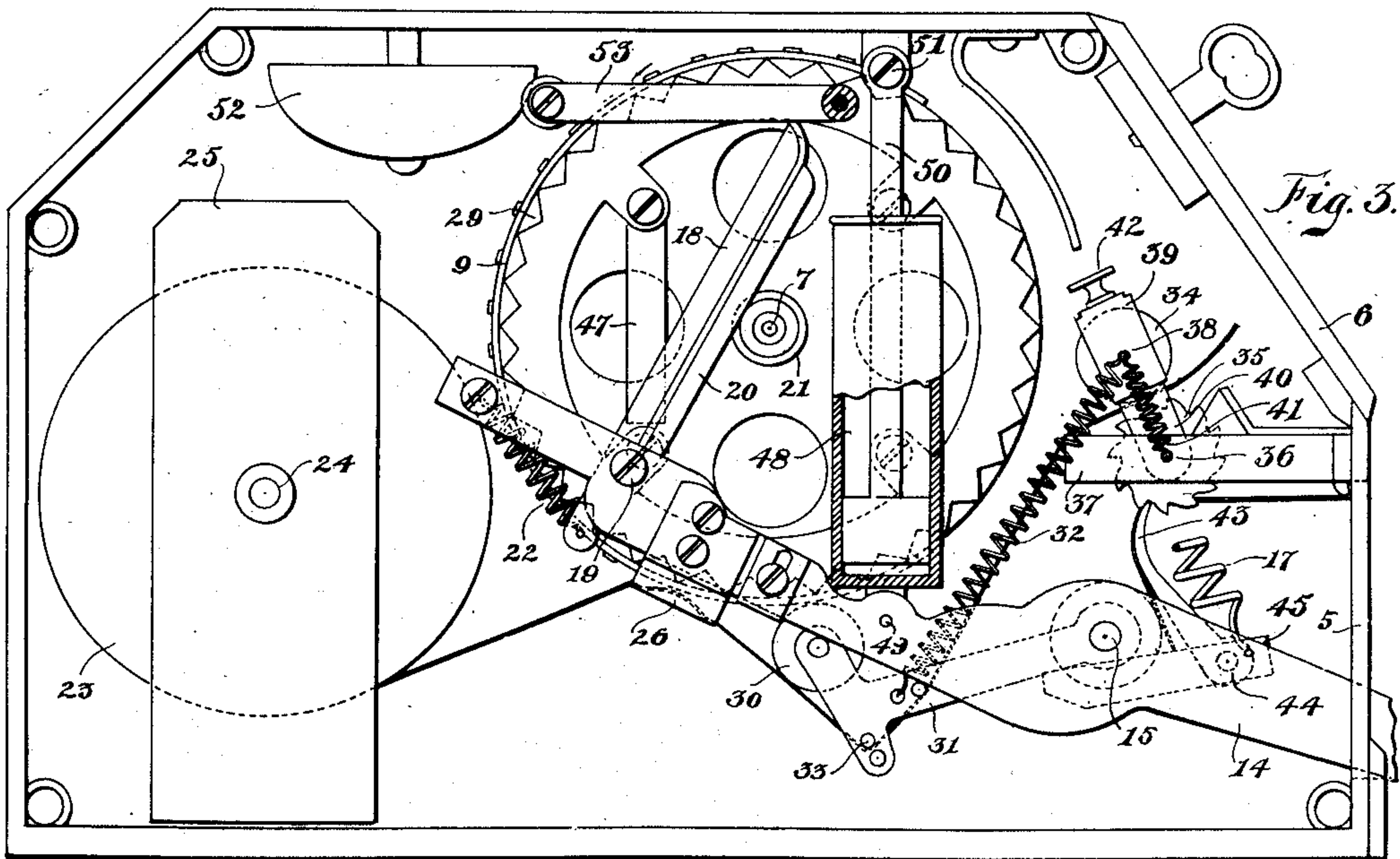
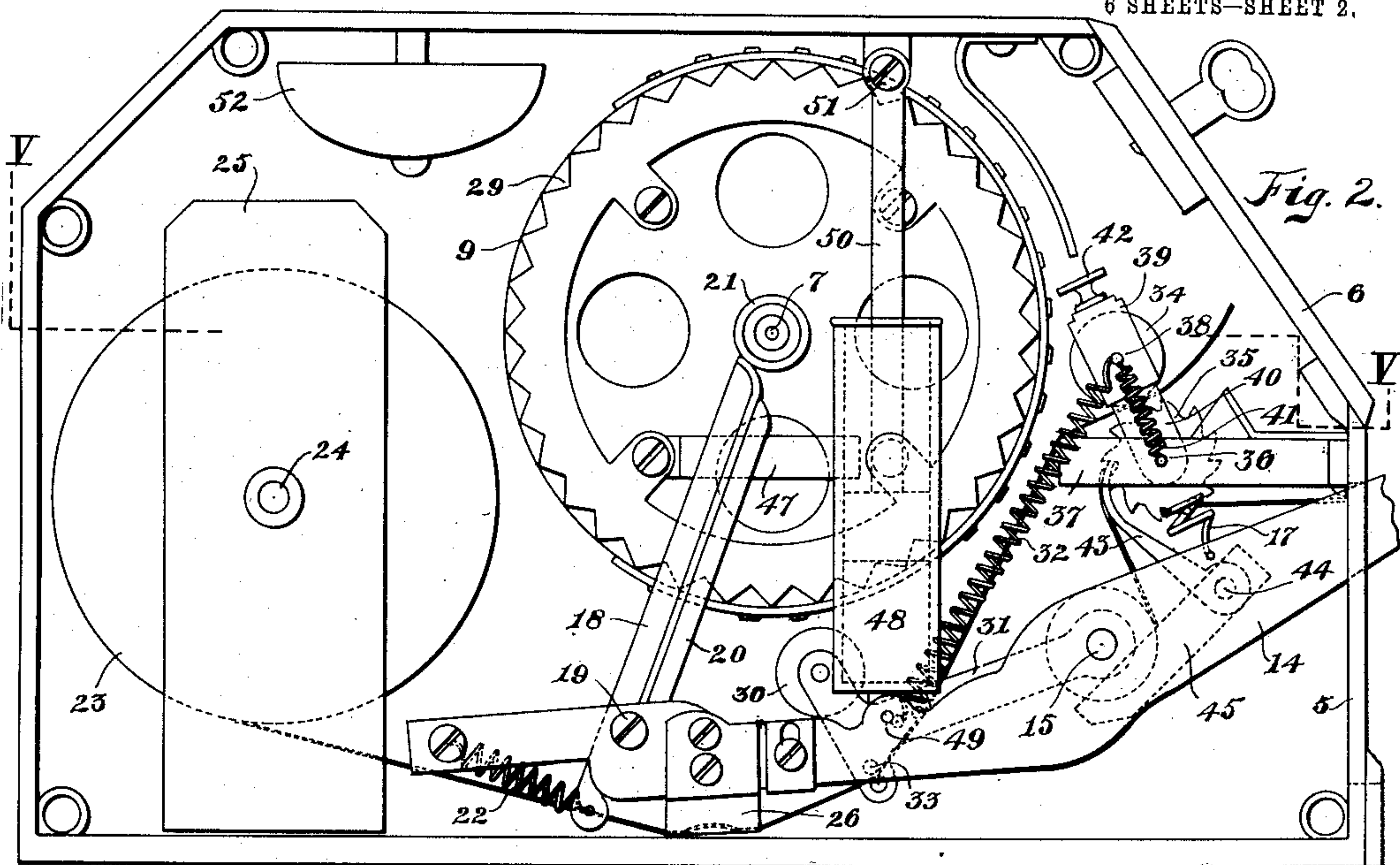
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6 SHEETS—SHEET 2.



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Fig. 4.

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6 SHEETS—SHEET 3.

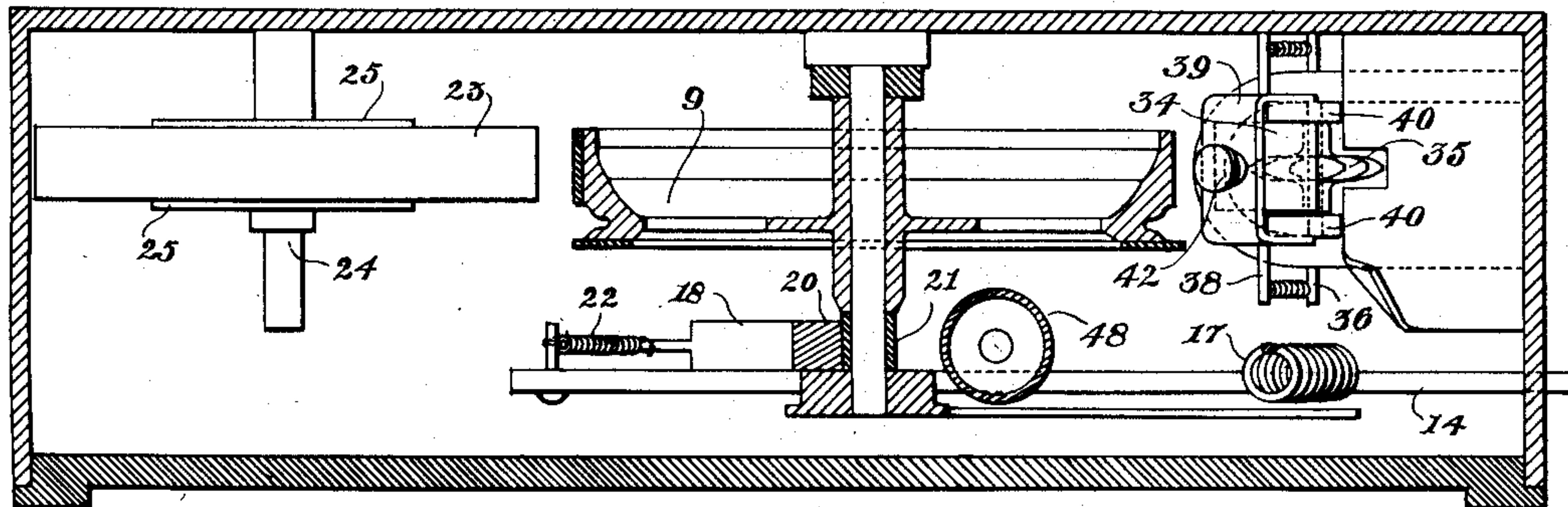


Fig. 5.

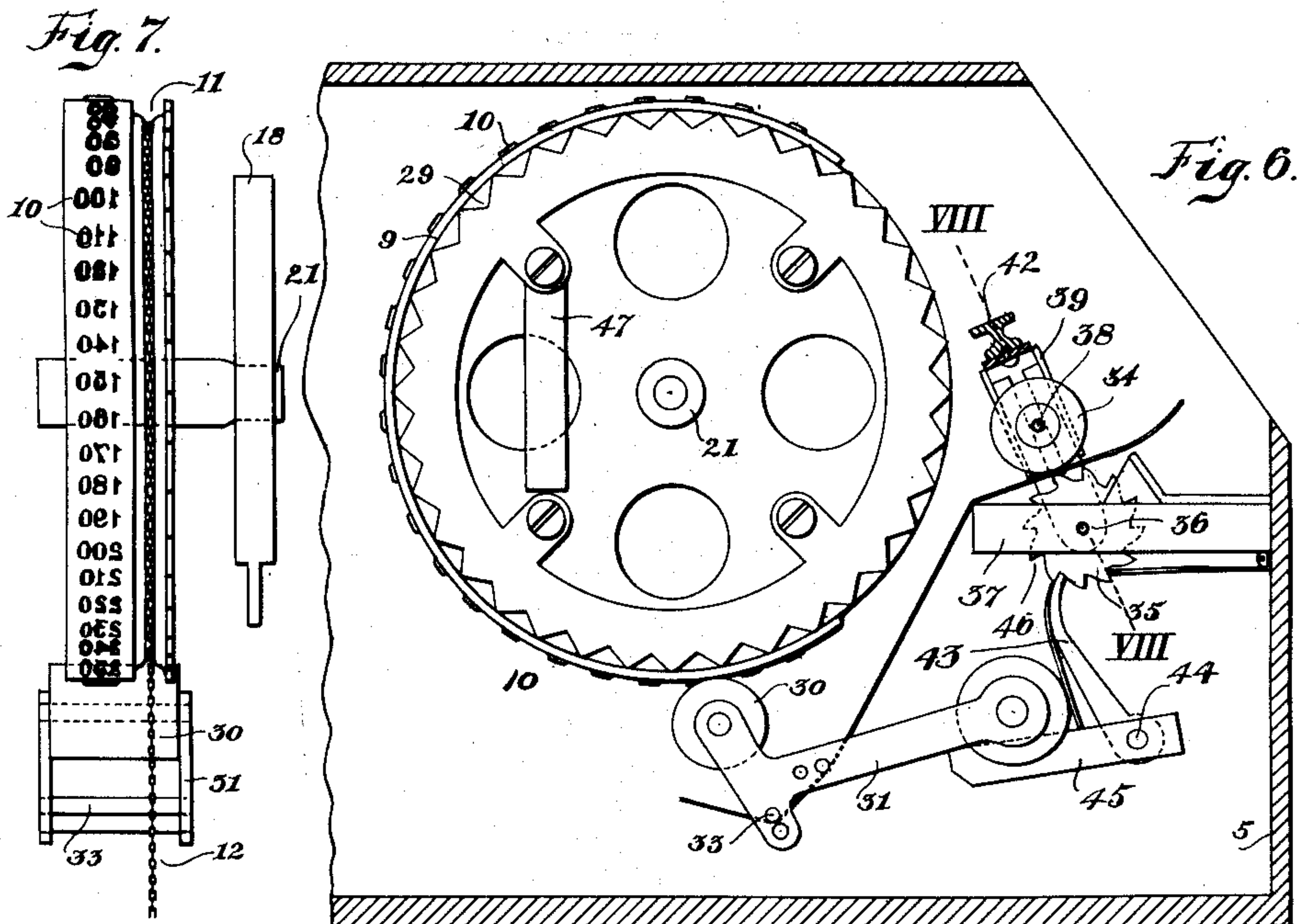


Fig. 6.

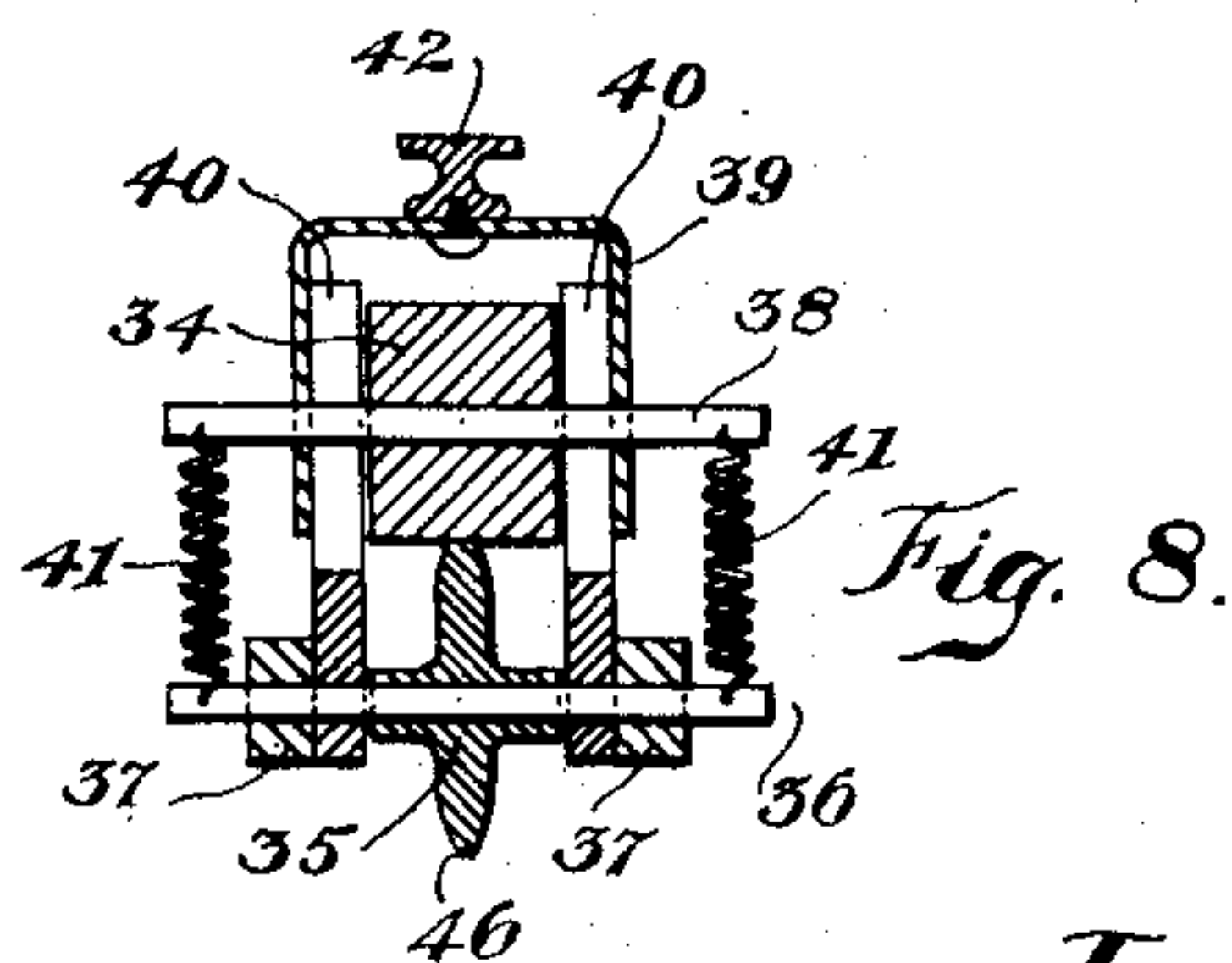
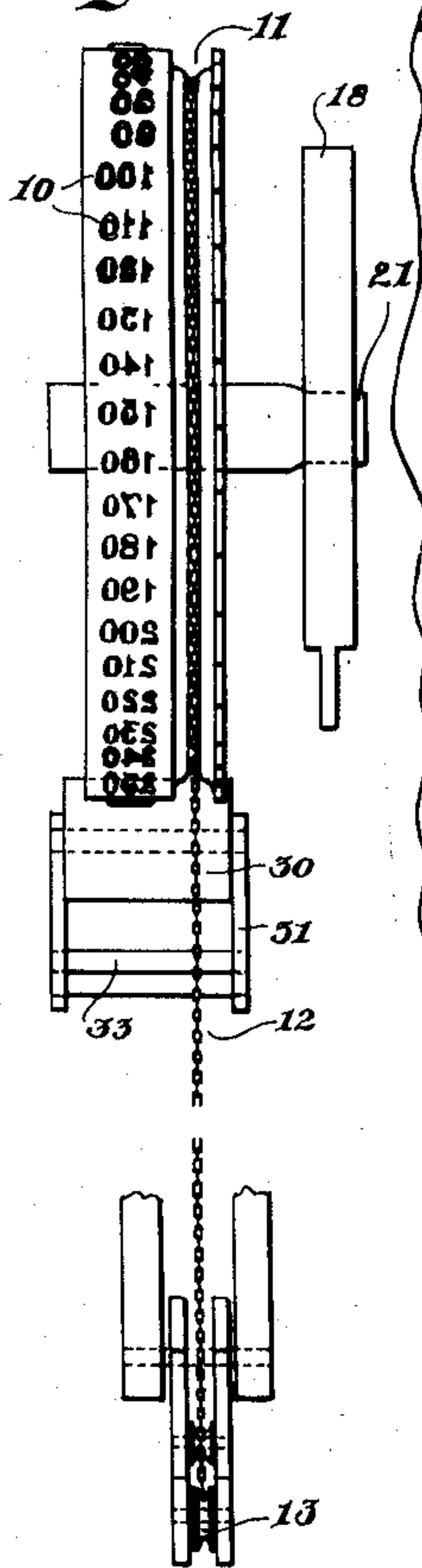


Fig. 8.

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6 SHEETS—SHEET 4.

Fig. 9.

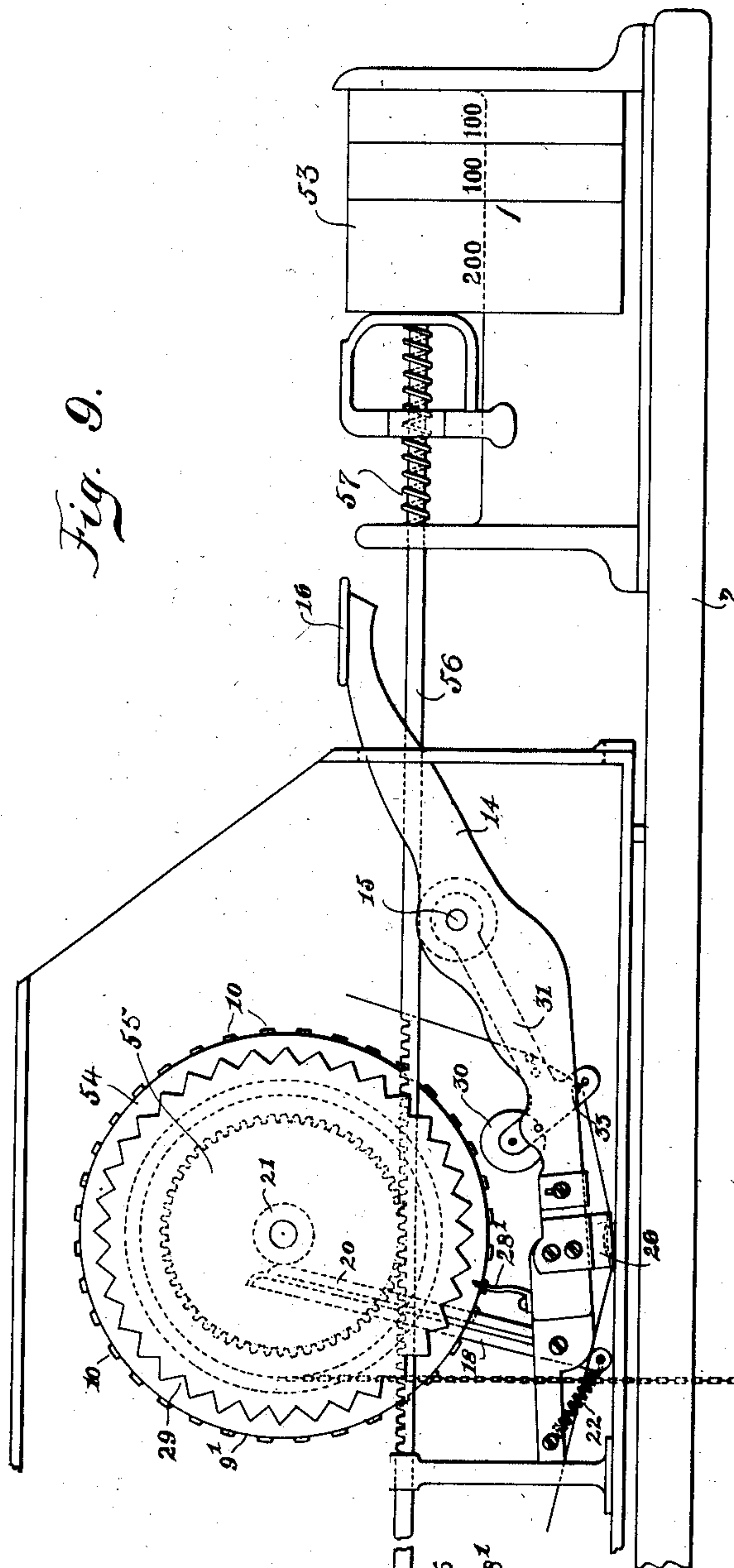
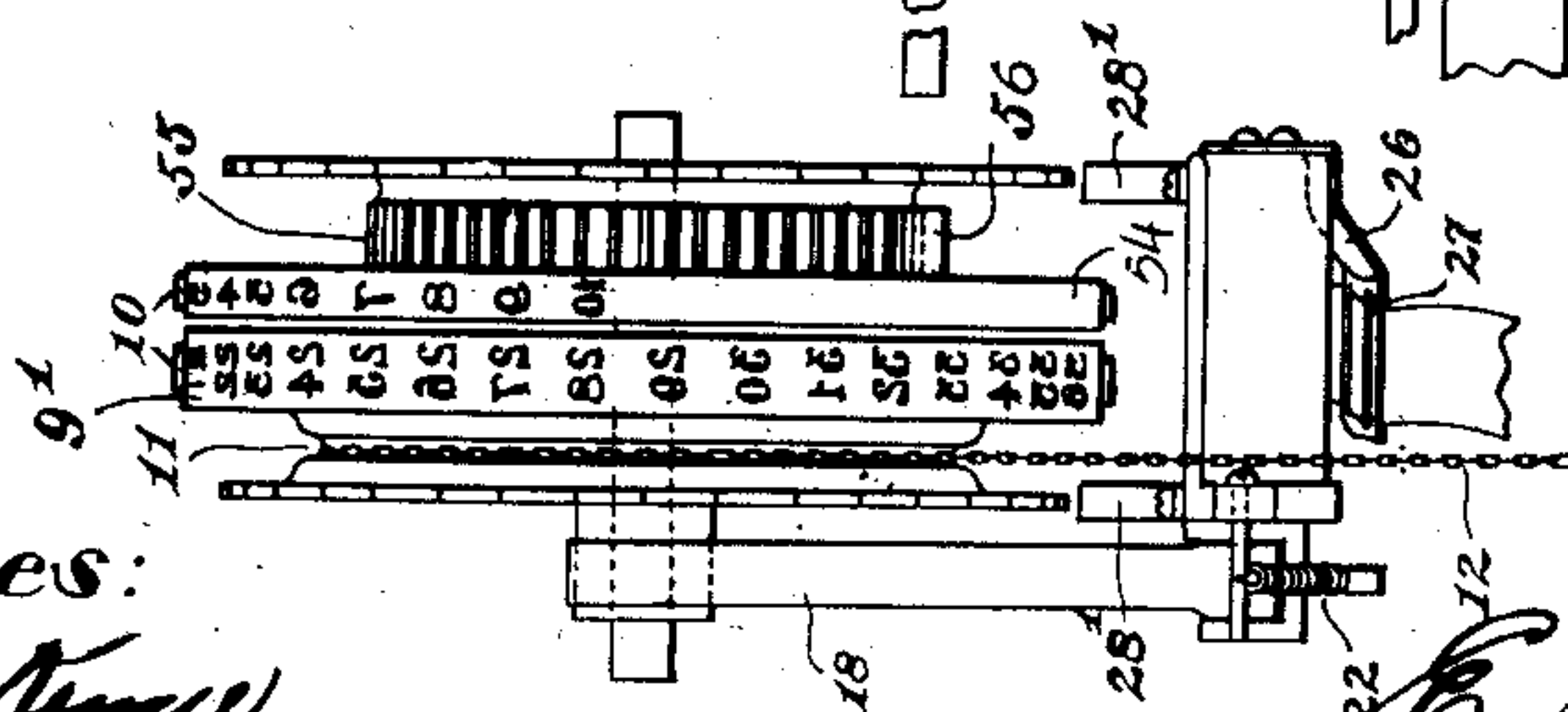


Fig. 10.



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6 SHEETS—SHEET 5.

Fig. 11.

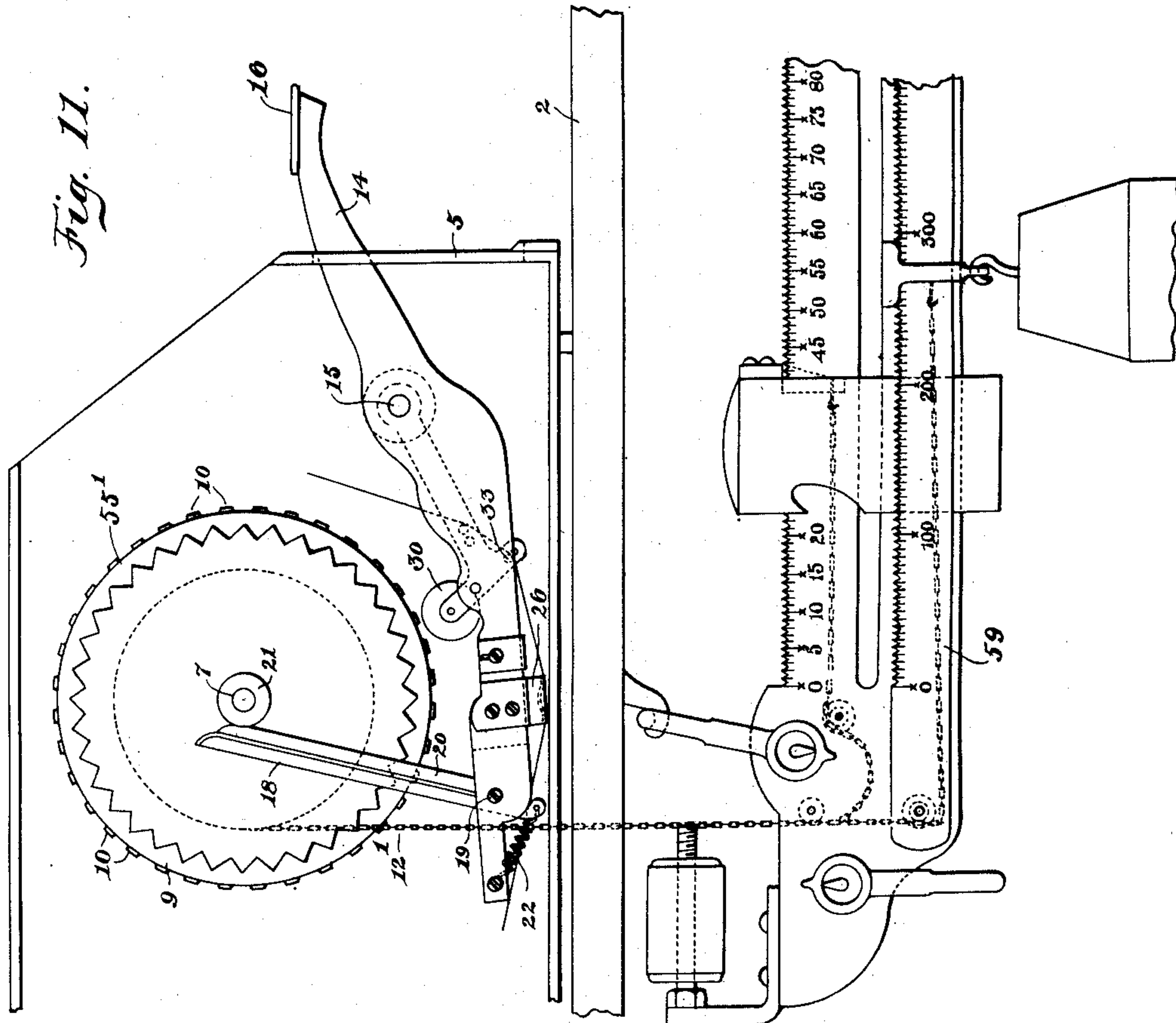
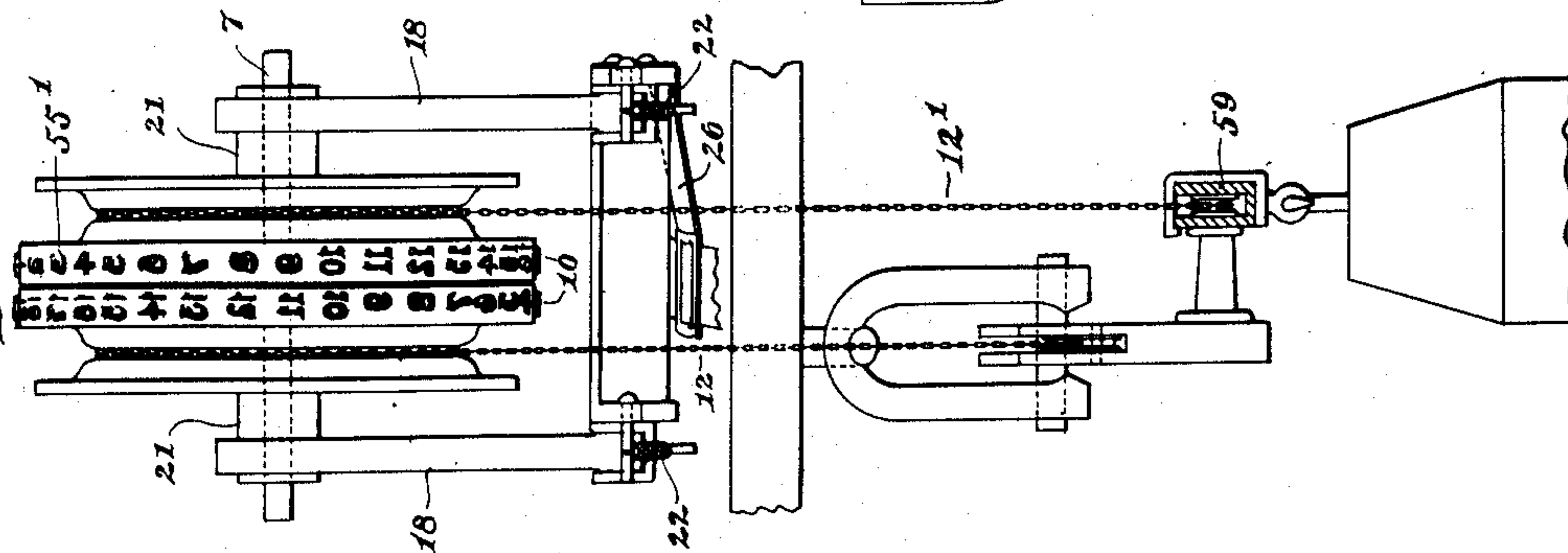


Fig. 12.



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MECHANICAL RECORDING SCALE.

APPLICATION FILED MAY 31, 1904.

6 SHEETS—SHEET 6.

Fig. 13.

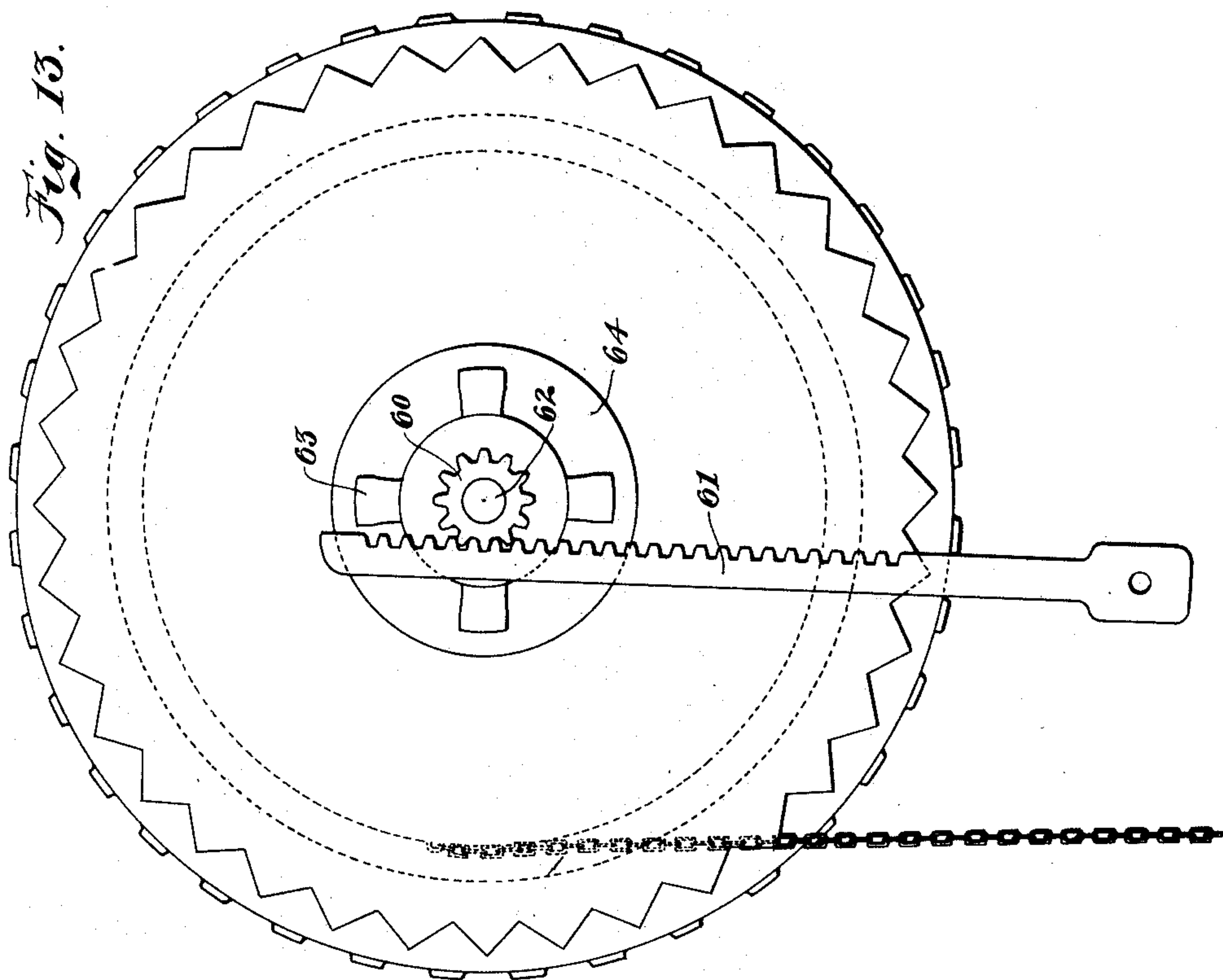
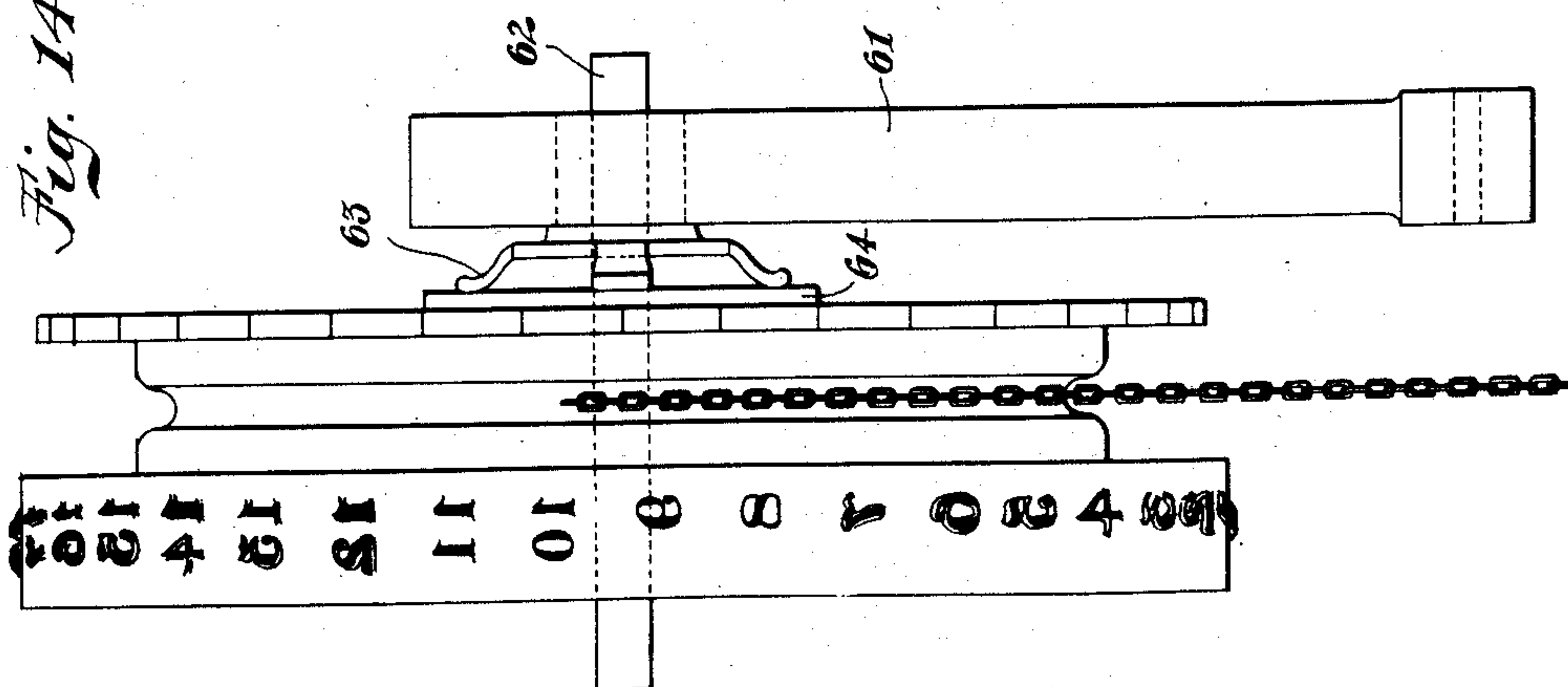


Fig. 14.



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by O. M. Clarke
his attorney

UNITED STATES PATENT OFFICE.

EDWARD McGARVEY, OF YOUNGSTOWN, OHIO.

MECHANICAL RECORDING-SCALE.

No. 812,286.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed May 31, 1904. Serial No. 210,513.

To all whom it may concern:

Be it known that I, EDWARD McGARVEY, a citizen of the United States, residing at Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Mechanical Recording-Scales, of which the following is a specification, reference being had therein to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a view in front elevation of my improved registering-scale. Fig. 2 is an enlarged view of the printing mechanism, a portion of the front frame having been removed. Fig. 3 is a similar view showing the operation of printing the strip. Fig. 4 is a detail view of the strip-raising arm. Fig. 5 is a horizontal cross-section on the line V V of Fig. 2. Fig. 6 is a partial detail view of the printing-wheel, inking-wheel, and feed mechanism. Fig. 7 is an edge view of the wheel, rotating friction-arm, &c. Fig. 8 is a cross-section on the line VIII VIII of Fig. 6. Fig. 9 is a view in elevation, showing a modified construction employing a supplemental printing-wheel providing for greater range of action. Fig. 10 is an edge view of said wheels and their connected parts. Fig. 11 is a view in elevation, showing my invention applied to a double beam-scale. Fig. 12 is an end view of Fig. 11. Figs. 13 and 14 are detail views showing a modified construction of wheel-turning mechanism. Fig. 15 is a detail view illustrating a modification.

My invention relates to an improvement in scales; and it consists of means whereby each operation of the scale is registered in conformity with the weighing operation by means of one or more type-wheels which print the weight for each operation upon a tape which progressively travels through the machine and is thus provided with a record of all of the operations for any stated period. The printing-wheel is directly controlled by the poise through a connection adapted to bring the proper type-figures into printing position corresponding to the weight indicated by the poise on the beam.

The invention also provides means for application to scales of different capacity by combining the poises of a double beam-scale with a double wheel construction and also for automatically adjusting a supplemental printing-wheel by the removal of the weights.

Referring now to the drawings, 2 is the cap of a scale provided with the usual balancing-

beam 3 and poise 4, the beam being preferably provided with a clearance-opening for the passage and protection of the chain. Mounted upon the cap 2 is an inclosing case 5, within which is located the printing registering mechanism, the case being provided with a door or gate 6, adapted to be locked to prevent unauthorized intrusion, it being desired to accumulate the recorded weights during any stated period, as a day, and to remove a portion of the strip containing them at the termination of such period for examination or filing.

Rotatably mounted on a spindle or shaft 7, journaled in bearings in a suitable frame 8 within the case, is a wheel 9, provided with a series of printing type-figures 10, arranged partially or wholly around its periphery, the wheel also being provided with a groove 11 for actuating chain or cord 12, which is secured to the wheel at a point sufficiently far around its circumference to insure sufficient rotation for the greatest range of movement of the poise 4. The chain 12 passes from wheel 9 downwardly around a guiding-sheave wheel 13, mounted in a suitable opening in the beam, and is connected to the poise 4, as shown, so that as the poise is moved outwardly to the indicating-point on the beam it will carry the chain with it, and thus anchor that end of the chain, so that when the wheel is rotated, as hereinafter described, it will act to limit its movement at the proper point for correct printing.

The mechanism is actuated by a key-lever 14, pivoted at 15, provided with a depressing-terminal 16, extending outwardly through a slot in the end of the case 5 and normally held retracted in position for operation by a spring 17. A wheel-actuating arm 18 is pivotally mounted in lever 14 at 19, provided with a frictional face of rubber or other suitable material 20, adapted to bear inwardly against a corresponding rubber hub 21 of wheel 9, a spring 22 exerting sufficient pressure to insure operative frictional engagement at all times.

23 is a roll of paper tape rotatably mounted on bearings 24, journaled in suitable supporting-brackets 25, the tape being arranged in alinement with the type-wheel and adapted to be drawn successively from the roll as it is used.

The arm 14 is provided with a laterally-arranged inwardly-extending tympan 26, preferably rounded at its upper side to insure

good contact and to prevent contact with the adjacent non-registering type and provided with slots 27 27, through which the tape is laced, as clearly shown in Fig. 4, so as to present a limited section only of the tape against the type. The lever 14 is also provided with a locking pin or abutment 28, adapted to engage notches or grooves 29 around the edge of the type-wheel and to fixedly adjust it to the exact position desired at the moment when the printing operation takes place. The type are inked by a roller 30, mounted in a frame 31, pivotally mounted on bearing-pin 15 or elsewhere and normally held in contact with the type by spring 32.

The tape passes from the printing-tympan around a guiding pin or roller 33, mounted in frame 31 or elsewhere, in a suitable position to lead the tape downwardly away from the type and then upwardly between a spring-pressed feeding-roller 34 and a feeding-wheel 35, conveniently made in the form of a ratchet-wheel. The feeding-wheel 35 is rotatably mounted on a bearing pin or shaft 36, journaled in a suitable bracket 37, while the roller 34 is rotatably mounted on a pin or shaft 38, carried by a housing 39, slidingly mounted upon supporting guiding extensions 40. The roller 34 and the intervening tape are held into operative engagement with feed-wheel 35 by springs 41, connecting shafts 36 and 38, or otherwise suitably applied, and the housing 39 is provided with a button 42, by which it and the roller 34 are raised to free the tape when it is desired to draw it freely from the machine for removal of a completed section or series of printed numbers.

Feeding movement is imparted to the tape at each operation of lever 14 by means of a spring-pressed pawl 43, pivoted at 44 in an arm 45, secured to the hub or any suitable portion of the lever, as shown. The pawl passes downwardly on downward movement of the lever, engaging one of the ratchet-teeth 46 of wheel 35 on upward movement due to spring 17 after the printing operation, thus shifting wheel 35 one space and correspondingly moving the tape forward sufficiently far for the next operation.

For the purpose of assisting in reversing the wheel 9 at the last portion of its reverse travel, also bringing it to a constant initial position, and to insure inking of all of the type and relieving the chain 12 of strain, a counterweight 47 is suitably secured upon the wheel, although ordinarily the friction-arm 18 will impart reverse movement to it when the lever is retracted. A dash-pot 48 is connected at 49 to lever 14, adapted to engage a plunger-rod 50, pivoted at 51, which acts to prevent a too sudden action of lever 14 and its connected parts.

It is desirable to give a signal when the lever 14 has been depressed to its full limit, and thus insure a complete operation, and for this

purpose I have provided a bell 52, which is sounded by a tapper 53, thrown into contact by the upper end of arm 18 at about the limit of its upward travel, thus indicating to the operator the completion of a full operation. It is obvious that the bell or other similar signal may be located at any suitable position in the apparatus and that it may be sounded by any convenient mechanism adapted to be actuated by the operative mechanism at the proper time, as stated.

The operation will be readily understood from the foregoing description. In the operation of weighing, the poise is located upon the beam, which is preferably notched to prevent disturbance of the poise by the tension of the wheel on the chain. The movement of the type-wheel is thus regulated, so that the printing-figures corresponding to the indicated weight will be arrested by the chain in proper location for printing, and the operation is completed by depressing the lever and then releasing it, the tape thus being imprinted with the recorded weight. The successively-recorded weights will be imprinted in alinement with each other and may easily be added together to find the total weight for any selected period after the tape has been torn off and removed.

The machine just described is adapted only to a scale having the capacity indicated by the maximum capacity graduated on the beam—as, for instance, four hundred pounds. When it is desired to apply the invention to scales of larger capacity than can be graduated over the range of a single beam, I employ the modifications shown in Figs. 9, 10, 11, and 12. In the construction shown in Figs. 9 and 10 means are provided whereby upon removal of the weights 54 from their rack for use on the outer end of the beam movement proportionate to the width of the weight is imparted to a supplemental hundreds or thousands wheel 55 through a connected pinion-wheel, engaged by a rack-bar 56, normally retracted by a spring 58 and normally held outwardly by the weights or some of them when in position on the rack. As one or more weights are removed for use the rack-bar will be proportionally retracted, rotating the pinion and type wheel to its proper position, said wheel then operating in conjunction with the units-wheel 9'. It will be understood that otherwise the same mechanism is employed performing the same functions, it being only necessary to provide a sufficiently wide tape with a corresponding change in the other elements, the lever 14 being provided with an additional arresting or adjusting pin 28' for the additional wheel. This mechanism operates as follows: During the operation of weighing and recording we will suppose the beam to be graduated over a range of one hundred pounds, each notch on the beam representing one pound, the full

capacity of the scale being, say, six hundred pounds, the difference between one hundred and six hundred being made up by the use of weights. In the weighing of a load of, we
 5 will say, four hundred and sixty pounds the first operation will be to remove four hundred pounds in weights from the weight-rack and to place them on the counterpoise on the end of the beam. This will effect to allow the
 10 bar 56, actuated by the spring 57, to move into the space which was previously occupied by these weights, and consequently turn by the rack-and-gear movement the type-wheel 54 to such a position as will make it print the
 15 figure "4" in alinement with the number "60," which will be printed by type-wheel 9', controlled by the chain and brought to position by the poise and lever mechanism when the lever is depressed for the purpose of making a record.

In the modification shown in Figs. 11 and 12 a double beam is used, the lower bar 59 of which is traveled by a sufficiently heavy poise to balance at its greatest movements
 25 over the full capacity of the scale. I merely provide a supplemental type-wheel 55', provided with figures corresponding to the hundreds and thousands of beam 59, connected by a chain 12', said wheel operating in conjunction with units-wheel 9 through a duplicate set of mechanism, the same in all respects as that already described.

In Figs. 13 and 14 is shown a modified arrangement of the friction mechanism by which the type wheel or wheels are brought
 35 to the proper position for printing on depression of the key-lever 14. In place of the rubber hub 21, fixed to wheel 9 or its shaft, a pinion 60 is engaged by a rack-bar 61, corresponding to friction-arm 18. The pinion 60 is loose on the wheel-shaft 62 and is provided with a spider or star wheel 63, the arms of which bear with considerable friction against a washer 64, of leather, rubber, or other frictional material, secured to the side of the type-wheel.

In Fig. 15 I have shown a detail view illustrating a modified construction of connection between the poise-chain and the poise, employing a terminal wedge, adapted to be
 50 drawn forward by the chain between the oppositely-disposed arms 65 65 of the poise and to expand them against the inner sides of the slotted beam. This construction is designed
 55 as a substitute for a notched beam and operates to clamp the poise in position, its binding hold increasing, so that it will thus be held rigidly in position against disturbance by the printing operation.

The advantages of my invention will be readily appreciated from the foregoing description, and it will be found to perform its functions in a satisfactory and efficient manner. The mechanism is comparatively simple,
 65 not liable to get out of order, and the re-

sults secured are highly desirable and render the accuracy of weighing and of recording the weights independent of the operator and therefore not subject to mistake.

Changes and variations may be made by 70 the skilled mechanic in the various parts or details of construction; but all such are to be considered as within the scope of the following claims.

I claim—

1. A scale provided with rotatable recording mechanism, a movable poise, a flexible connection between the poise and the recording mechanism adapted to limit its rotation in one direction, with independent means for 75 rotating the recording mechanism to take up the slack in the flexible connection and for pressing a flexible strip against said recording mechanism, substantially as set forth. 80

2. A scale provided with recording mechanism, a depressible actuating-lever therefor, a movable poise, and a flexible connection between the poise and the recording mechanism, substantially as set forth. 85

3. A scale provided with rotatable recording mechanism, a frictional actuating device therefor, a movable poise, and a flexible connection between the poise and the recording mechanism adapted to limit its rotation in one direction, substantially as set forth. 90 95

4. The combination with a scale-beam provided with an adjustable poise, of a pivoted printing-wheel having peripheral type, a frictional actuating device engaging the printing-wheel, and a connecting-chain attached 100 to the poise and to the printing-wheel adapted to limit its rotation in one direction during subsequent inoperative movement of the actuating device, substantially as set forth.

5. The combination with a scale-beam provided with an adjustable poise, of a pivoted printing-wheel provided with stamping-type on its periphery, means for rotating the wheel, means for limiting its rotation connected with the movable poise and depending 105 upon the position thereof, and means for pressing a recording-surface against the wheel, substantially as set forth. 110

6. The combination with a scale-beam provided with an adjustable poise, of a pivoted printing-wheel provided with peripheral stamping-type, means for rotating the wheel to bring the type into register, a limiting flexible connection connected with the wheel and with the poise, a recording-strip, means for 115 pressing the strip against the wheel, and means for feeding the strip, substantially as set forth. 120

7. The combination with a scale-beam provided with an adjustable poise, of a pivoted printing-wheel, a movable poise, and an intervening connection between the poise and wheel by which its rotation is limited, means for rotating the wheel, means for pressing a recording-surface against the wheel, means 125 130

for positively holding the wheel during the printing operation, and means for feeding the strip, substantially as set forth.

8. The combination with a scale-beam provided with an adjustable poise, of a pivoted printing-wheel, a poise, an intervening connection adapted to limit the movement of the wheel, an inking device, a recording-strip, and a depressible lever provided with means for bringing the strip into contact with the wheel, means for feeding the strip, means for inking the type of the wheel, and a pivoted friction-bar arranged to actuate the wheel, substantially as set forth.

9. The combination with a scale-beam provided with an adjustable poise, of a pivoted wheel having peripheral type, actuating mechanism therefor arranged to rotate the printing-wheel, a movable poise connected with the printing-wheel and arranged to limit its rotation dependent on the position of the poise, means for pressing a recording-surface against the type of the wheel, and a signal device, substantially as set forth.

10. The combination with a scale-beam and movable poise thereon, of a rotatable pivoted type-wheel, a flexible connection between the type-wheel and the poise whereby its rotation in one direction is limited, means for pressing a recording-strip against the type-wheel, means for positively actuating the type-wheel, and means for returning it, substantially as set forth.

11. In a recording-scale, the combination with a scale-beam and a movable poise mounted thereon, of a pivoted wheel provided with peripheral type, a flexible connection between the poise and said wheel arranged to limit its rotation in one direction, a pivoted spring-retracted lever provided with a friction-arm arranged to rotate the wheel, means for positively locking the wheel, means for feeding a printing-strip, an inking device, and a pressing-platen incorporated with said lever arranged to press the strip against the type of the wheel, substantially as set forth.

12. The combination with a pivoted type-wheel and a movable check flexibly connected therewith arranged to arrest its rotation, of a pivoted lever provided with a friction-bar arranged to rotate the type-wheel, and a supplemental type-wheel arranged to operate in combination with the first type-wheel, with means for independently adjusting said supplemental wheel dependent on the presence and absence of the scale-weights, substantially as set forth.

13. The combination with a primary pivoted wheel provided with peripheral type, a movable check flexibly connected therewith, a frictional hub, and an actuating-lever provided with a pivoted friction-bar; of a supplemental type-wheel provided with a pin-

ion, a rack-bar in engagement with said pinion provided with an actuating-spring arranged to impart motion to said rack-bar and supplemental type-wheel and a weight-rack adapted to support the weights in alignment with said bar so that upon removal of one or more weights constituting abutments for said rack-bar the bar will become operative, substantially as set forth.

14. The combination with a primary pivoted type-wheel provided with peripheral type, a poise, an intervening flexible connection, and a pivoted lever provided with a friction-bar arranged to actuate the type-wheel; of a supplemental type-wheel provided with a pinion, a spring-actuated rack in engagement therewith arranged to make abutting contact against the scale-weights when in position on the rack, and strip-pressing mechanism, and wheel-locking devices incorporated with the pivoted lever, substantially as set forth.

15. In a scale, the combination of a primary and a secondary type-wheel, a pivoted lever provided with friction-bars arranged to rotate said wheels, strip-pressing mechanism incorporated with said lever, a units-beam provided with a poise, a supplemental beam provided with a poise and connections from said poises to the primary and secondary wheels whereby their rotation is limited according to the position of the poise, substantially as set forth.

16. Mechanism for rotating a type-wheel consisting of the combination therewith of a pinion provided with spider-arms adapted to bear against the wheel, and a rack-bar in engagement with said pinion with means for limiting rotation of the wheel, substantially as set forth.

17. Mechanism for rotating a type-wheel consisting of a pinion provided with spider-arms adapted to bear against the wheel, and a rack-bar in engagement with said pinion, with means for actuating the rack-bar with means for limiting rotation of the wheel, substantially as set forth.

18. In a recording-scale, the combination with a pivoted type-wheel, of a pivoted actuating-lever provided with a pivoted bar having a friction-surface arranged to rotatably engage the hub of the wheel, means for imparting a pressure through said friction-bar upon the hub, and means for limiting the rotation of the wheel in conformity with the reading of the scale-beam, substantially as set forth.

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

EDWARD McGARVEY.

Witnesses:

C. M. CLARKE,
JAMES McC. MILLER.