

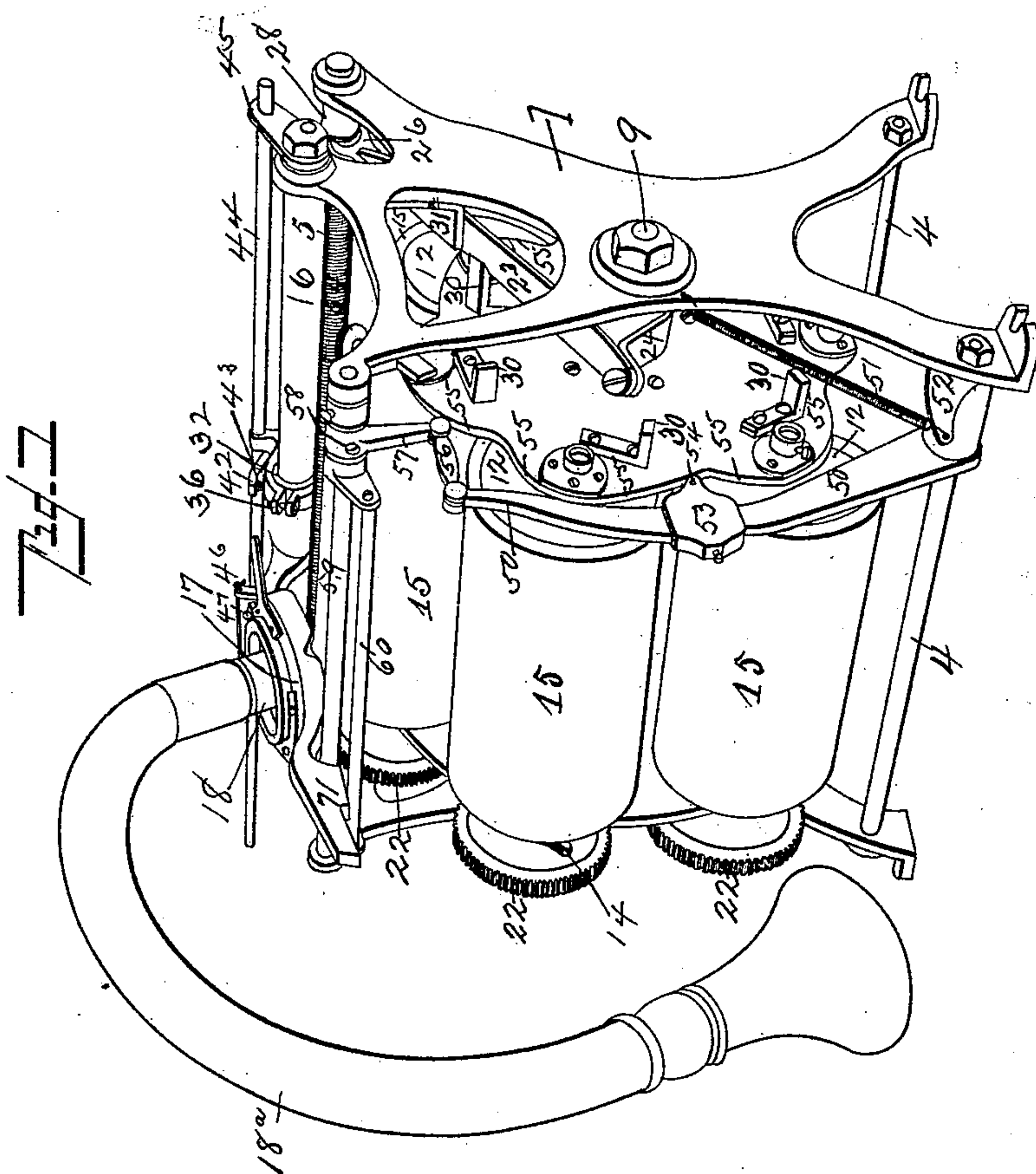
(No Model.)

8 Sheets—Sheet 1.

J. L. ATKINS.  
TALKING MACHINE.

No. 495,869.

Patented Apr. 18, 1893.



Witnesses  
E. J. Myers  
C. S. Frye

Inventor  
Joseph L. Atkins

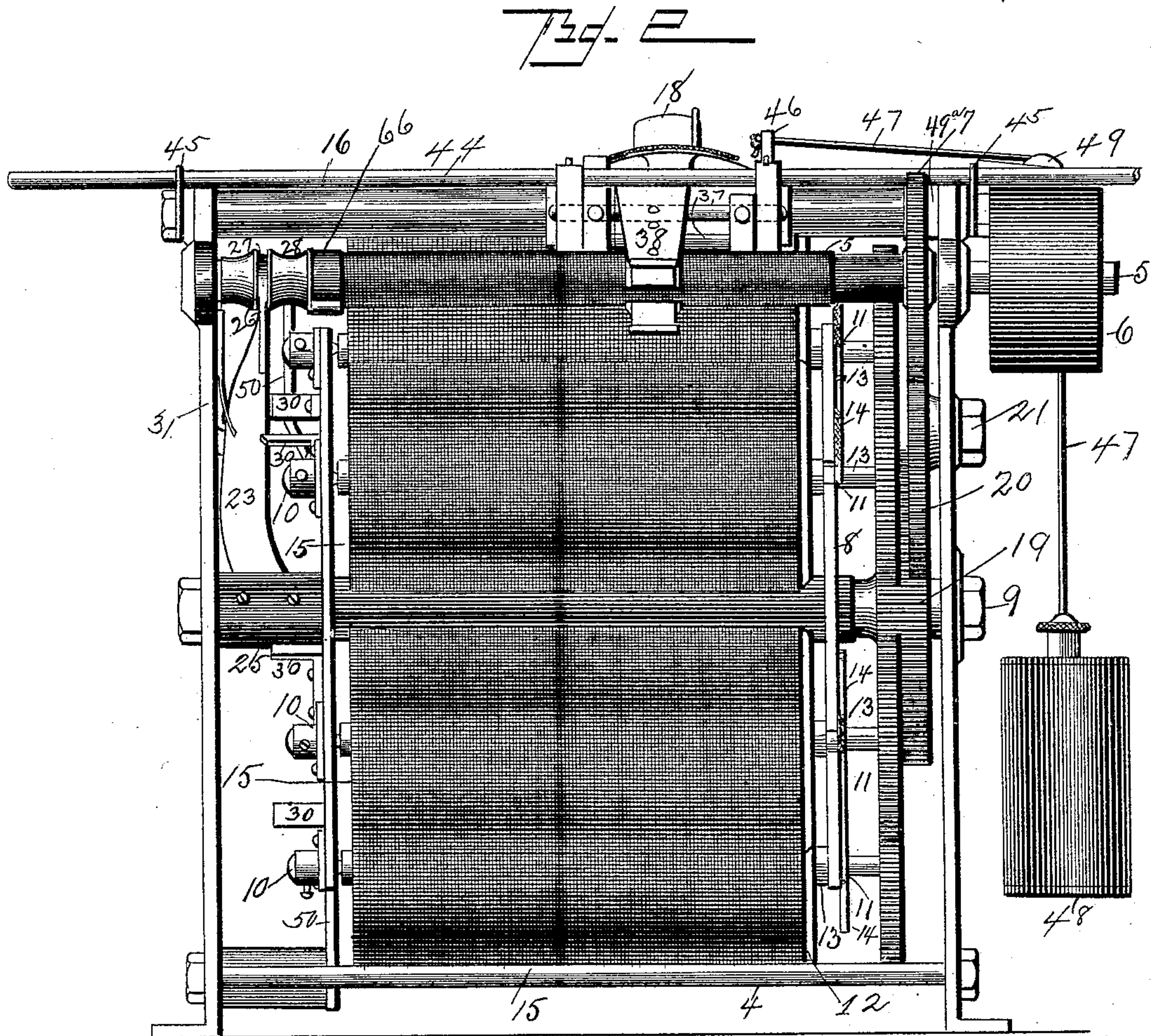
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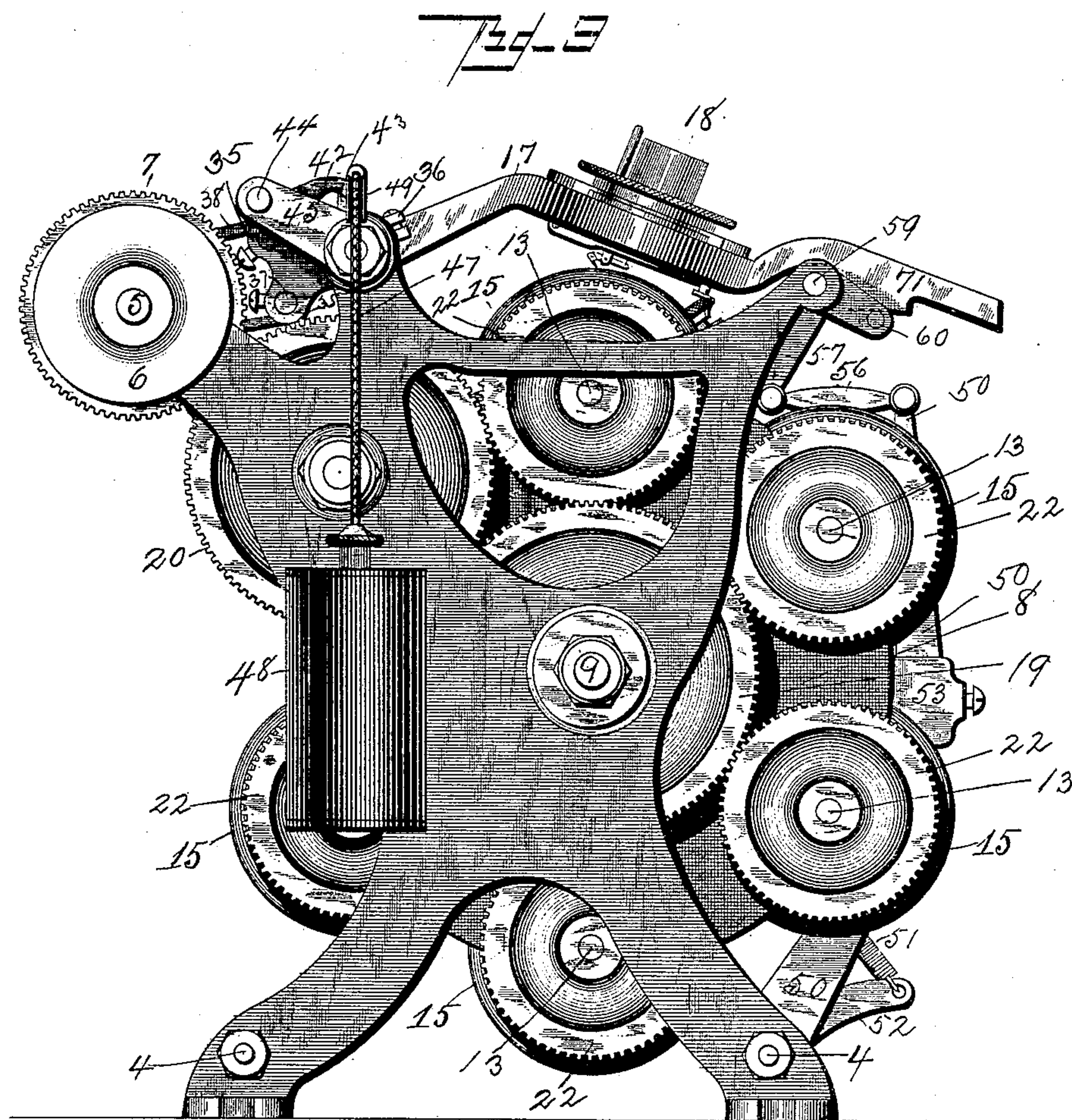
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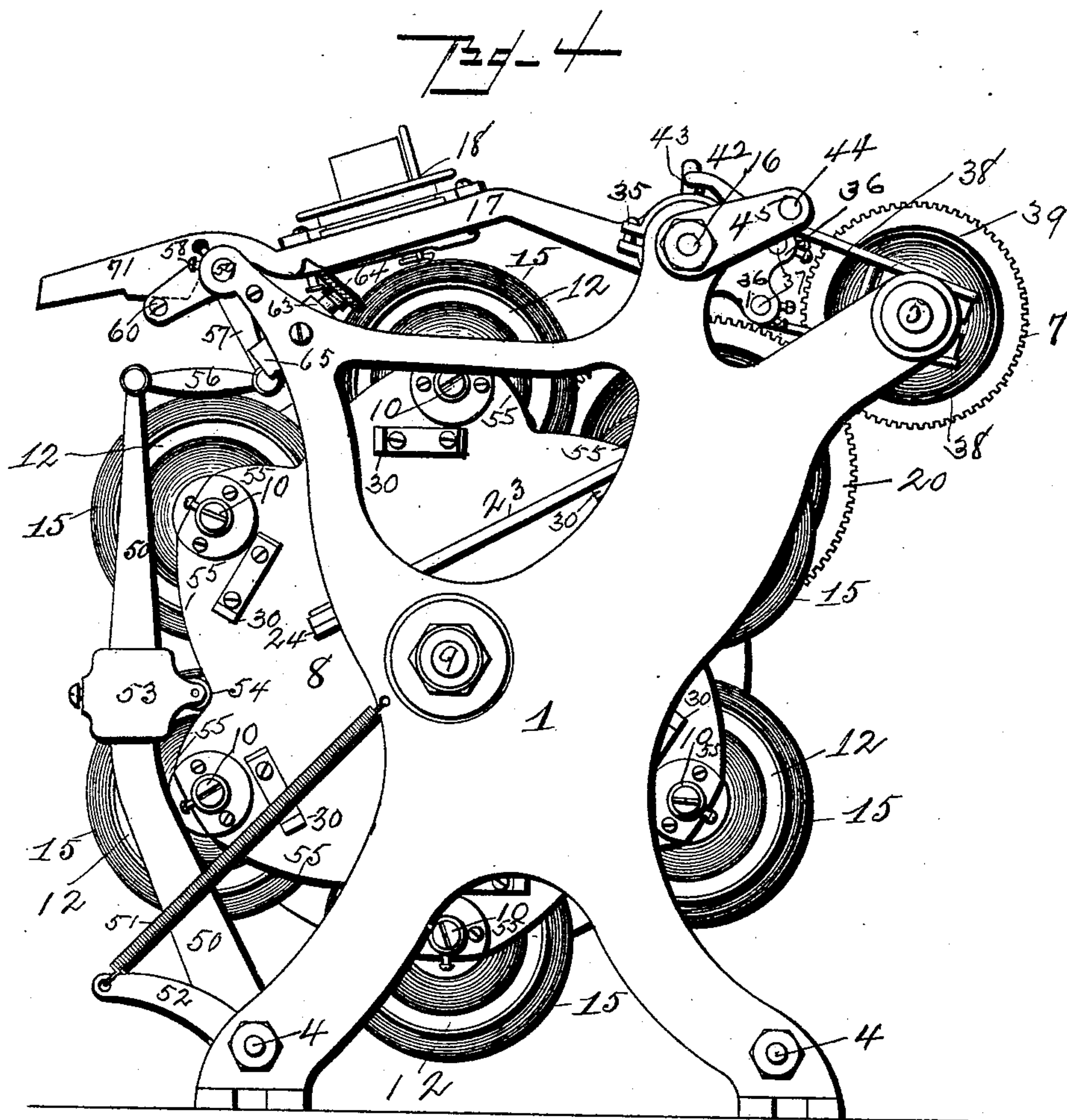
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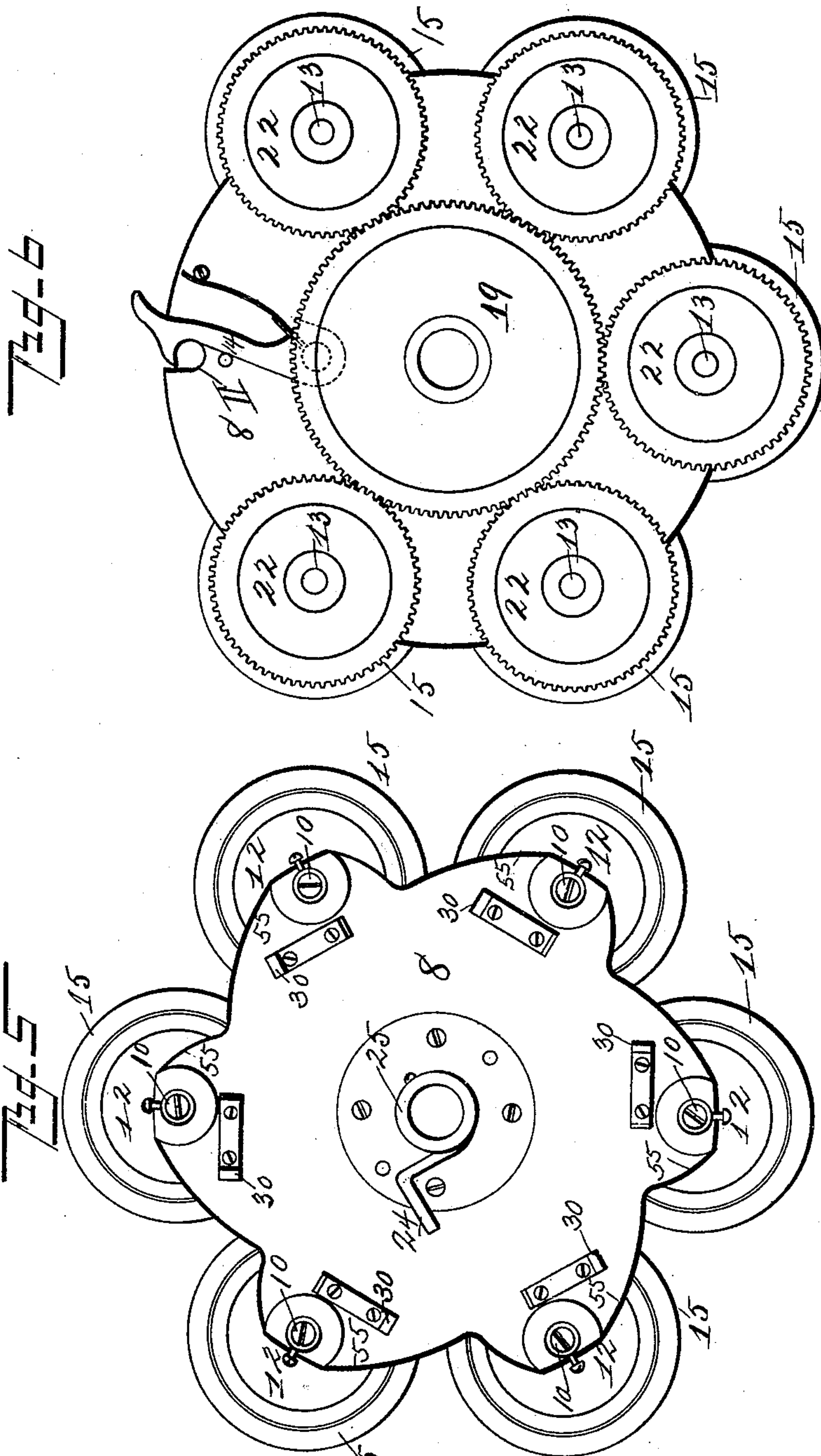
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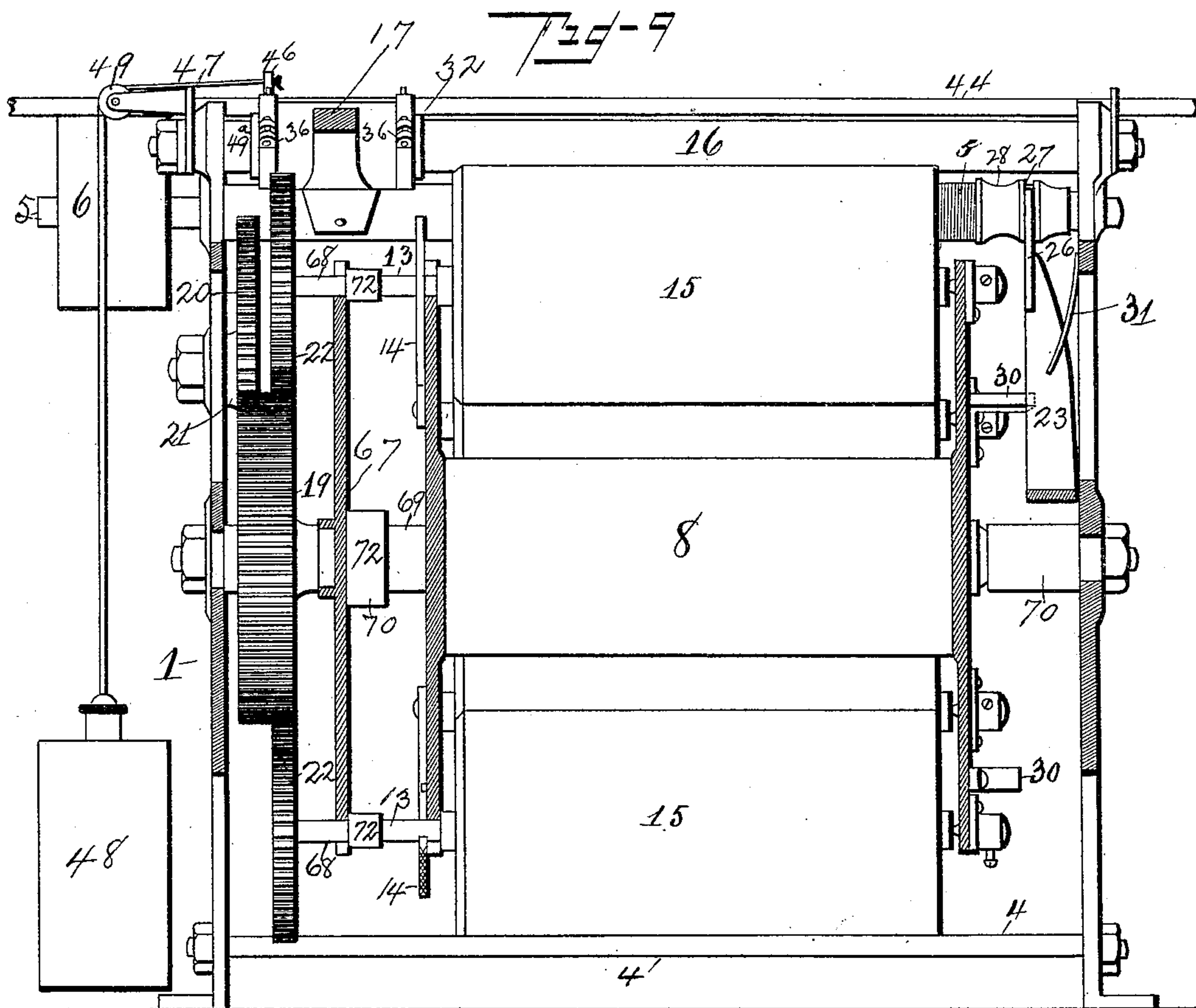
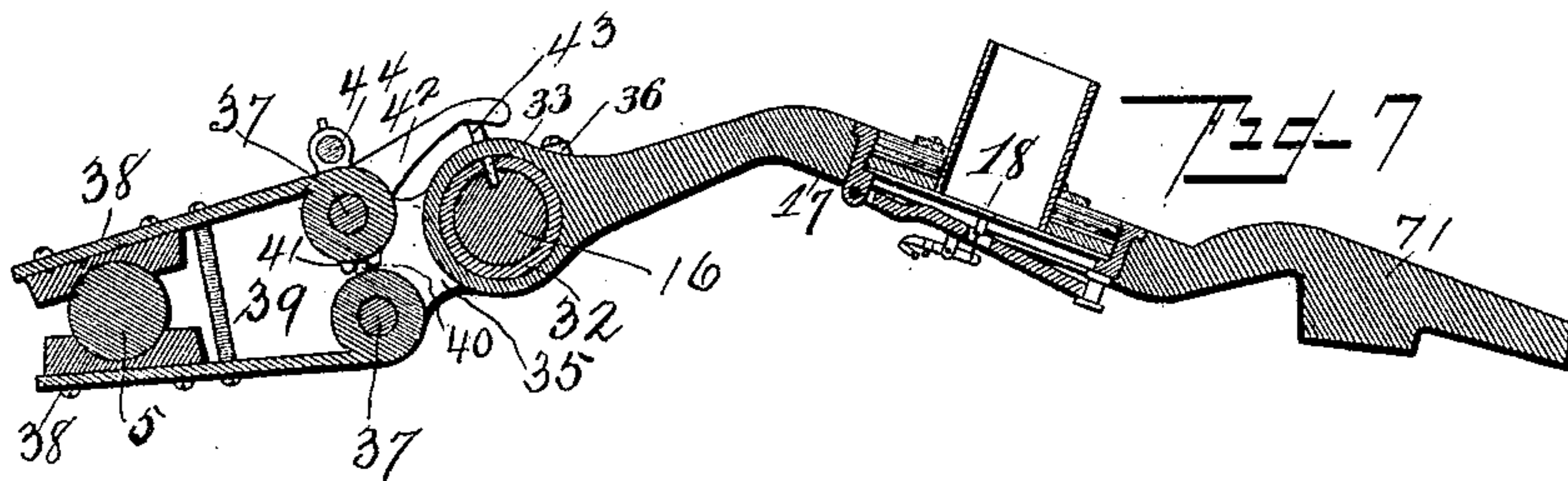
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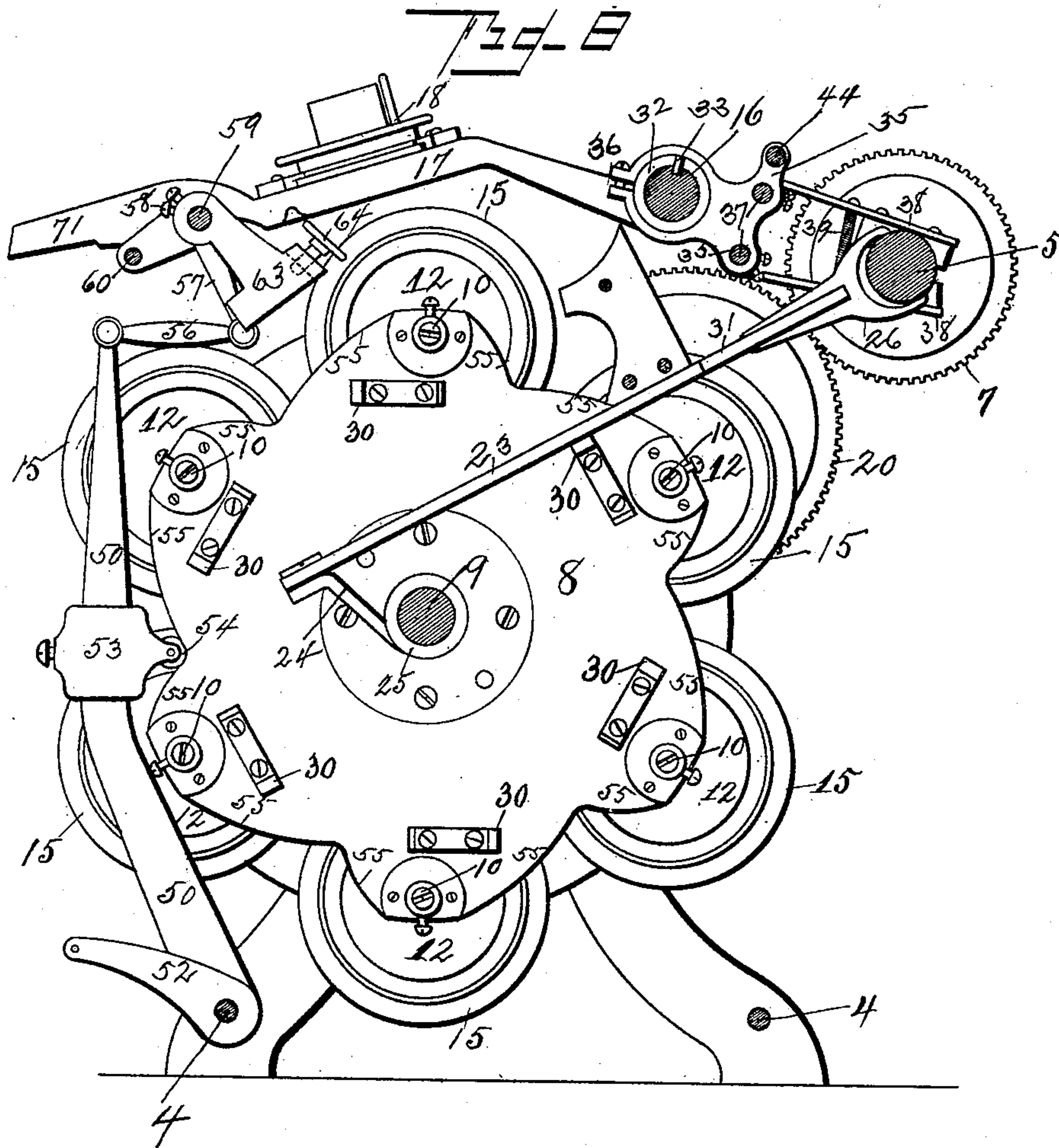
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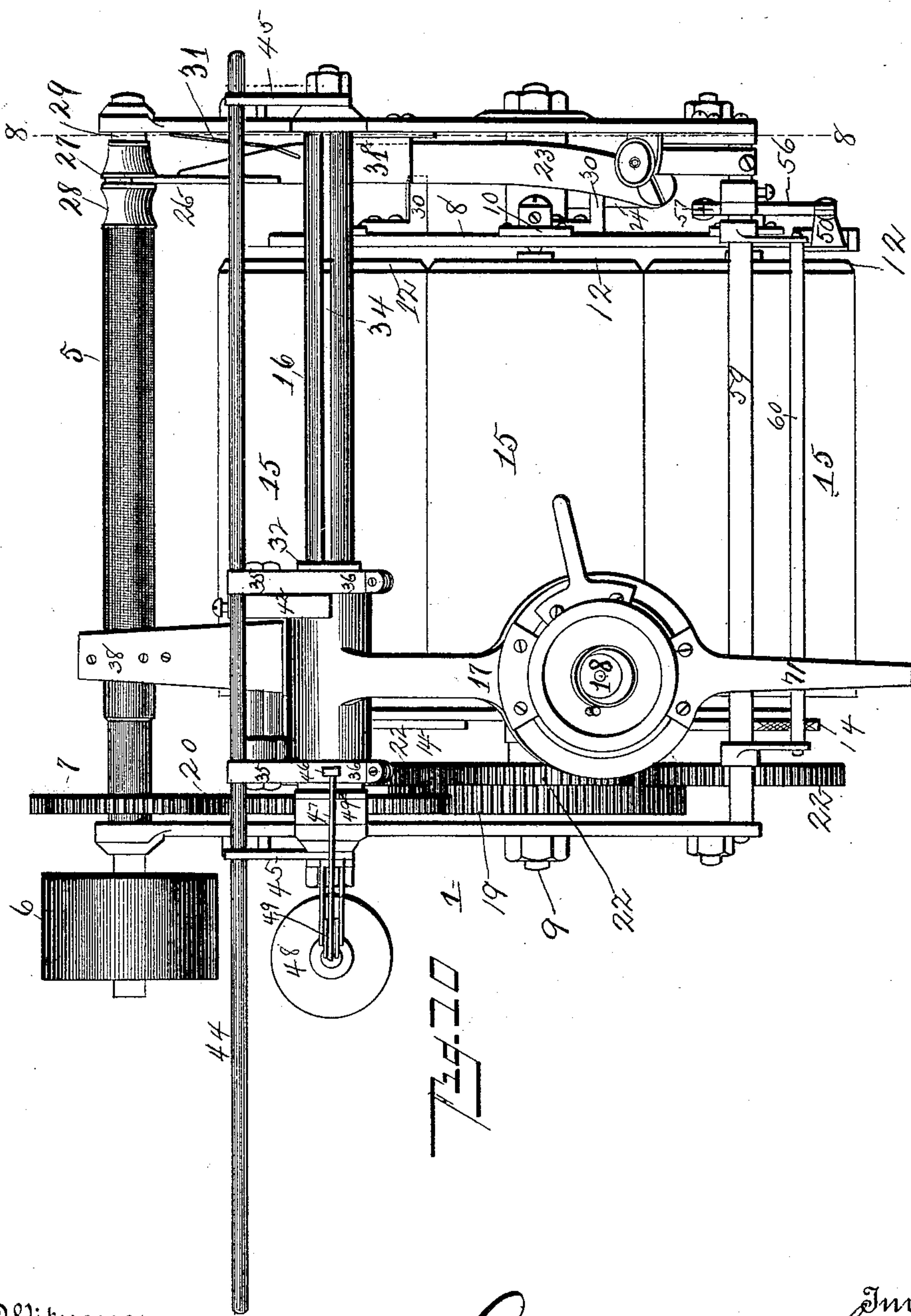
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C. S. Frye

Inventor

Joseph L. Atkins



# UNITED STATES PATENT OFFICE.

JOSEPH L. ATKINS, OF WASHINGTON, DISTRICT OF COLUMBIA.

## TALKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 495,869, dated April 18, 1893.

Application filed August 27, 1892. Serial No. 444,287. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH L. ATKINS, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Talking-Machines, of which the following is a specification, reference being had to the accompanying drawings.

The object of my invention is to produce a talking machine that is practically continuous in its operation for receiving and repeating a speech or discourse of indefinite length, and operating automatically and without attention or manipulation of any sort.

Incidentally to the carrying out of my object I have also produced certain preferred forms of mechanism which will be hereinafter fully illustrated and described, and succinctly set forth in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view, taken from the front of my machine. Fig. 2 is a rear elevation thereof. Fig. 3 is a side elevation; and Fig. 4 a similar view, taken from the opposite side. Fig. 5 is a view of one side of the loaded magazine, detached; Fig. 6 a similar view of the other side. Fig. 7 is a sectional view of the diaphragm carrier and the mechanism for operating it. Fig. 8 is a vertical sectional view, on the line 8, 8 of Fig. 10. Fig. 9 is a vertical section of a modification of my machine and Fig. 10 a top plan view of the machine shown in Fig. 1.

Referring to the figures on the drawings, 1 indicates a suitable frame, which may be constructed in any desirable manner; but preferably, as I now consider it, of end plates 2 and 3 and connecting bolts or rods 4.

5 indicates an endless screw journaled in suitable bearings in the end plates, and adapted to be driven as from a pulley 6. It is well known in the art that the time of rotation of the screw which imparts motion to the diaphragm should be regulated with respect to the tablet. For the purpose, therefore, of operatively connecting the screw with the tablet, I provide upon the screw a fixed gear 7.

Since the object of my invention is to produce a continuously operative machine, I find it essential to provide mechanism for automatically displacing a completely inscribed or transcribed tablet; and also mechanism for replacing another tablet for inscription or

transcription, as the case may be. It is not only essential that these mechanisms should be employed, but also that they should act conjointly not only in displacing and replacing a tablet, respectively, but that both displacing and replacing mechanisms should properly take care of their respective tablets after each operation.

As at present constructed talking machines are provided with exceedingly fragile tablets, and it is necessary that the displacing and replacing mechanisms should support them at all times without friction, shock, or jar. In consideration of the conditions aforesaid I have preferred to adopt a cylindrical frame or magazine 8, which is loosely mounted upon a journal 9, secured to the side plates of the frame. This element, which I have termed a magazine comprehends, in addition to the office denoted by that term, in combination with its correlated driving parts, tablet-displacing and tablet-replacing mechanism; and therefore I wish clearly to define what I mean by these terms.

The magazine carries in suitable bearings 10 and 11, tablet carriers 12, preferably round and revoluble and individually provided with shafts 13. Each of the bearings is provided with a suitable, spring-actuated catch 14, for removably securing the carrier shaft.

The tablet-carriers, in their present preferred forms as above suggested, are preferably tapered, and each is adapted to carry an internally tapered tablet 15.

Inasmuch as the cylindrical frame, loaded with its carriers and tablets, is at all times provided with a plurality of tablets, it may be properly designated as a magazine; and in that term I comprehend broadly all forms of mechanism for carrying a plurality of tablets, with or without separate tablet carriers.

16 indicates a fixed guide-rod carried in the end plates of the frame, and carrying thereon a movable diaphragm carrier 17, within which is mounted a sound receiver as for example a diaphragm 18, which diaphragm may be of any suitable and ordinary construction and provided with a flexible conveyer 18<sup>a</sup>; and preferably provided with usual mechanism for adapting it to the purposes of inscription or transcription.

By the terms inscription and transcription,



respectively, which, for the sake of brevity I have employed, I mean the recording upon the tablet of sound waves, or the reproduction of recorded sound waves.

5 The diaphragm is in practice, as usual, carried in operative proximity to one of the tablets. As usual, the relative positions of the tablet and the diaphragm are caused gradually to change, so that preferably the stylus  
10 of the diaphragm follows a spiral course around the tablet until it shall have covered the surface thereof. It is obvious, and is well understood in the art that the relative change of positions of those parts may be gained  
15 either by the motion of the diaphragm, or the motion of the tablet. In the present embodiment of my invention I prefer to make the diaphragm movable endwise of the tablet.

Referring particularly to the illustrated  
20 form of my machine, by my invention I cause the automatic displacement of a completely covered tablet, and the replacement of a new one. It will, therefore, appear that the cylindrical magazine herein illustrated and de-  
25 scribed, when in operation, resolves itself into displacing and replacing mechanism, and in this connection performs two separate and distinct offices, namely, of removing a covered tablet and of presenting a new tablet in front  
30 of the diaphragm. I wish to make this distinction perfectly clear, because, although for the reasons above stated I prefer a cylindrical magazine, and one which incidentally combines within itself, when in operation, a tablet-receiving and tablet-displacing mechanism, I do not wish to be understood as confining myself to such continuous form of magazine, or to the very close and intimate relationship between the replacing and displacing  
40 mechanisms arising out of the use of such a magazine. In addition to the reasons as set forth for my preference toward a cylindrical magazine, I consider it as productive of the best results to provide for the simultaneous  
45 synchronous rotation of all the tablets carried at one time in the magazine, or, at least of the one which is being operated upon by the diaphragm, and of the one which is about to be brought into requisition to insure a  
50 similarity of effects upon each of the tablets as they are successively operated. Suitable mechanism for accomplishing this result is shown in the drawings, in which 19 indicates a gear secured to the magazine and revolubly  
55 with it upon its shaft.

20 indicates an idle-wheel carried upon a stud 21 in one of the side plates of the frame, and adapted to communicate motion from the screw-gear 7 to the magazine-gear 19. Each  
60 tablet-carrier shaft is provided with a gear 22, meshing with the gear 19. Power transmitted from the screw-gear 7 tends by this arrangement to rotate the magazine upon its axis, and to impart synchronous rotation to each  
65 of the tablet-carriers. In practice, however, the resistance of the load of the tablet car-

riers upon the gear 19 being greater than the opposition to its rotation upon its shaft, the effect of the arrangement shown would be, without obstruction, to drive the magazine  
7c cylinder upon its axis without imparting motion to the tablet-carriers. By overweighting the magazine cylinder, however, the motion may be transferred from the former to the latter. For this purpose in this instance for  
75 example I employ an arm 23, pivotally carried upon a projection 24, extending from a collar 25 carried upon the magazine cylinder journal 9. Its loose end is preferably bifurcated, as indicated at 26, and engages on opposite  
80 sides with an annular groove 27 in a sliding collar 28 upon a smooth bearing 29 at the extremity of the endless screw 5.

30 indicates lugs suitably located, respectively, in proximity to each of the tablet carriers, upon the side of the magazine cylinder, and projecting outwardly in the direction of the arm. When the sliding-collar is moved toward the magazine, the arm is brought into the path of the lugs, and when the sliding-  
90 collar is moved against the side plate of the frame, the arm is out of reach of the lugs. A spring 31 carried in the arm and impinging against the side plate tends to keep the arm normally set in the path of the lugs.  
95

31<sup>a</sup> indicates a brace secured to the side plate, nearly opposite the place at which the lugs strike the arm, and is adapted to render it rigid.

From the foregoing description it will be  
100 perceived that when the arm is in its normal position, as actuated by its spring, the magazine may be driven until one of its lugs strikes against the arm. Thereupon the rotation of the magazine upon its axis will be  
105 stayed, and motion will be imparted to the tablet-carriers, which will continue to revolve under the application of the driving power until the magazine shall have been released. The proper location of the lugs 30 upon the  
110 side of the magazine is, as illustrated, such as to bring the tablet in advance of the retaining lug into operative relations with the diaphragm.

32 indicates a sleeve provided with a key  
115 33 that keys into a longitudinal groove 34 in the guide-rod 16, and renders it revolubly fixed, but longitudinally movable thereon.

35 indicates supports secured to the sleeve in any suitable manner, as for example by  
120 split collars 36. These collars serve to hold the oscillatory diaphragm-carrier 17 firmly.

37 indicates pins in the upper and lower parts of the projections.

38 indicates internally screw-threaded jaws  
125 that are fastened to the pins and pivoted thereby to the projections. The screw-threaded ends of these jaws are adapted to fit upon the threads of the endless-screw 5, and to be operated thereby when closed upon it; or to  
130 be released therefrom by the opening of the jaws.



39 indicates an expansible spring which tends to keep the jaws separated from the screw.

Referring to Fig. 7 40 indicates a mutilated gear secured to one of the pins; and 41 indicates a similar gear secured to the other pin, preferably the upper one. The mutilated gear 41 is provided with a projection 42, by which both the mutilated gears may be operated to work the jaws. By the force of the spring 39 the jaws will be normally kept open out of engagement with the screw. For that reason I provide a lug 43 upon the hub of the diaphragm-carrier 17, which serves to close the jaws and keep them locked upon the screw when the diaphragm-carrier is in its normal position for use.

44 indicates an auxiliary guide-rod secured to the projection 36, and movable in suitable bearings 45 upon the sides of the frame. The purpose of this auxiliary guide-rod is to impart smoothness of movement to the diaphragm-carrier sleeve 32 upon its rod.

46 indicates a lug connected with the diaphragm-carrier, and fastened to a cord 47, in the lower end of which is provided a weight 48. The cord is passed over pulley 49 secured to the side of the frame.

The entire mechanism may be designated as counterweight mechanism, and may be of any suitable and ordinary construction, its purpose being to restore the diaphragm-carrier to its original starting point when it shall have completed its travel and shall have been released from the screw 5.

49<sup>a</sup> indicates a suitable cushion around the guide-rod 16, which is adapted to receive the impact of the diaphragm-carrier at the end of its backward movement.

It will be understood from the foregoing description that the diaphragm-carrier, operated by the endless-screw 5, is caused to travel entirely across the face of one of the tablets. As it reaches the end of its travel the sides of the jaws 38 impinge against the sliding-collar 28, and move it upon its bearing toward the side of the frame, thereby moving the arm 23 out of the path of the lugs 30. Immediately thereupon the driving power of the machine operates as above explained to rotate the magazine upon its journal; and by the co-operation of suitable tripping mechanism the diaphragm-carrier will be instantaneously restored by its counterweight mechanism to its original position.

In the drawings I have shown a suitable form of tripping mechanism, which consists of a lever 50 pivoted to the lower front rod 4, and spring-actuated, as by a spring 51 fastened to the side plate of the frame, and to a projection 52 extending from the hub of the lever. This spring urges the lever toward the end of the magazine cylinder, against the edge of which the lever rides. For this purpose it is provided with an adjustable housing 53 that carries an anti-friction roller 54. This end of the magazine cylinder is provided

with a suitably curved cam surface 55 for each tablet carrier.

56 indicates a pitman pivoted at one end to the lever 50, and at its opposite end to a crank 57 that is secured as by a set-screw 58 to a rock-shaft 59 pivoted in the side plates of the frame.

60 indicates a diaphragm-carrier support, which is also securely fastened to the rock-shaft by a screw 61, preferably employed for the purposes of adjustment.

71 indicates a projection upon the end of the diaphragm-carrier, which extends outwardly and downwardly so as to reach and ride upon the support, and by which the diaphragm-carrier may be lifted in the ordinary manner in any part of its travel, it having been already explained that the lifting of the diaphragm-carrier separates it from the endless screw which drives it.

By the operation of the spring 51 the lever 50 will be kept pressed against the edge of the magazine cylinder end, which will draw the diaphragm-carrier support out of the way of the diaphragm-carrier and allow it to work freely over the face of the tablet. When the diaphragm-carrier, however, has reached the end of its travel and has moved the arm 23 out of the way of the lugs 30, and the driving power, as above explained, has been rendered effective for rotating the magazine cylinder upon its axis, the lever 50 riding upon the cam surface of the end of the magazine cylinder will be operated, and will instantaneously lift the diaphragm-carrier from the face of the tablet, separating the jaws and releasing them from the screw. At the same instant the counterweight mechanism will restore the diaphragm-carrier to its position. Then the magazine cylinder will have completed the portion of its revolution between the adjacent lugs 30, and the mechanism will be thereby restored to its former position. The weight of the diaphragm is ordinarily sufficient for closing the jaws upon the end of the screw; but other means may be employed for insuring that result, if preferred. The diaphragm-carrier may ride upon the support 60 in its travel backward and forward; and for that purpose I employ a projection 63 secured to the rock-shaft, and a set-screw 64 working in a projection 65 extending in the path of the former projection from the side plate of the frame. By this means the position of the diaphragm-carrier and its connected parts may be regulated to a nicety.

Where a diaphragm that is adapted for the work of both inscribing and transcribing is employed, it is necessary to provide for a difference in the travel of the diaphragm-carrier when inscribing and when transcribing. For that purpose a removable collar 66 in juxtaposition to the sliding collar 28 might be employed, (see Fig. 2.)

In Fig. 9 of the drawings I have illustrated convenient means for removing the magazine from the frame. Referring to that figure 67



indicates a bearing plate in which are permanently carried upon suitable journals 68 the tablet-carrier gears 22. The magazine is made substantially as before described, except that  
 5 it is provided with its proper shaft 69 adapted to be set into bearings 70 concentric with the gear 19. The opposite ends of the journals 68 and of the tablet-carrier shafts 13, as well as the magazine shaft 69 and the center of  
 10 the gear plate 67 are provided with suitable simple clutch devices 72. The effect of the device illustrated in Fig. 9 is substantially as above described, except that the magazine may be readily removed from its bearing.  
 15 In this way it is unnecessary to manipulate the tablets after having once adjusted them; but the magazines may be shifted from one machine to another, and each magazine rendered in effect a single tablet to be used in  
 20 the same manner as the ordinary tablet is now used.

It is apparent that the size of the magazine cylinder is immaterial to my invention. The cylindrical magazine is in effect an endless  
 25 conveyer, and it is immaterial whether it is made with solid sides, or with flexible sides.

The operation of my device is as follows: Suppose power to be applied to the pulley 6, motion will be immediately imparted to the  
 30 diaphragm-carrier and to the tablet-carrier in juxtaposition thereto. The operation of the machine and the method of using it will be substantially the same as in the ordinary phonograph until the diaphragm-carrier shall  
 35 have nearly completed its travel across the face of the tablet. At this time the jaws begin to press against the sliding-collar 28 and finally release the arm 23. Thereupon the cylinder magazine will be released, and will  
 40 begin its rotation upon its axis. Immediately the lever 50 will operate the diaphragm-support and lift the diaphragm. By the act of lifting the diaphragm the jaws will be opened and the counterweight mechanism will in-  
 45 stantaneously restore the diaphragm-carrier to its original position against the end-plate 2. As soon as the diaphragm-carrier is released the arm 23 will be restored by its spring to its original position, so that by the  
 50 time the diaphragm-carrier shall have reached its initial position, the magazine cylinder will have completed its allotted rotary movement, and will be set by the impingement of the lug 30 against the arm. The lever 50 in the  
 55 meantime having followed its cam will have lowered the diaphragm-carrier support, so that the diaphragm-carrier will have descended, closed the jaws, and recommenced its travel across the face of the replaced  
 60 tablet.

While the several movements of my machine may not be instantaneously explained, the entire operation, as above set forth, has been found in practice to be but momentary.  
 65 The time necessary for the complete shift from one cylinder to another is not so long as would be required to articulate an ordi-

nary three syllable word. Consequently in practice not more than one word of ordinary length could be lost, the connection could  
 70 never escape, and in ordinary use not so much as the loss of a single word would occur.

I desire it to be distinctly understood that I do not limit myself in any respect to any of the details of construction or arrangement  
 75 herein set forth; but reserve to myself the right to modify them for the purpose of producing any more desirable mechanical embodiment of my ideas within the scope of my invention.  
 80

What I claim is—

1. In a talking-machine, the combination with a frame, sound-receiver, and driving mechanism, of a plurality of tablets, and mechanism operatively connected with the driving  
 85 mechanism for automatically bringing each of the tablets successively into operative relations with the receiver, substantially as set forth.

2. In a talking machine, the combination 90 with a frame, sound receiver, and driving-mechanism, of mechanism connected with the driving-mechanism for automatically bringing each of the tablets successively into operative relations with the receiver, and mechanism also connected with the driving mechanism for automatically displacing and carrying each of said tablets after it shall have been used, substantially as set forth.  
 95

3. In a talking machine the combination 100 with a frame, sound receiver, and driving mechanism, of a tablet magazine, and intermittently operating mechanism connected with the driving mechanism for presenting an individual tablet to the receiver at regular  
 105 intervals, substantially as set forth.

4. In a talking-machine, the combination with a frame, sound receiver, and driving mechanism, of a tablet magazine, intermittently-operating mechanism connected with  
 110 the driving mechanism for presenting a tablet to the receiver at regular intervals, and mechanism also connected with the driving mechanism for carrying each completed tablet as it makes way for the next succeeding  
 115 one, substantially as set forth.

5. In a talking-machine, the combination with a frame, sound receiver, and driving mechanism, of a tablet magazine, intermittently-operating mechanism connected with  
 120 the driving mechanism for presenting an individual tablet to the receiver at regular intervals, and mechanism also connected with the driving mechanism for carrying and supporting each discharged tablet to prevent its  
 125 injury, substantially as set forth.

6. In a talking-machine, the combination with a frame, tablet magazine, and sound receiver, of continuously-operating driving mechanism for changing the relations of the  
 130 receiver with respect to each individual tablet, and intermittently-acting mechanism connected with the driving mechanism for operating the magazine to present successively a



new tablet to the receiver at regular intervals, substantially as set forth.

7. In a talking machine, the combination with a frame, driving mechanism and sound receiver connected therewith, of automatic tablet displacing and replacing mechanism also connected with the driving mechanism, substantially as set forth.

8. In a talking machine, the combination with a frame, a sound receiver and mechanism for alternately moving the receiver in opposite directions, of a tablet magazine and intermittently-acting magazine operating mechanism, substantially as set forth.

9. In a talking-machine, the combination with a frame and automatic alternately-reciprocatory sound receiver, of tablet displacing and replacing mechanism co-operatively and automatically connected with the driving-mechanism, substantially as set forth.

10. In a talking-machine, the combination with a frame, driving mechanism, and automatic alternately-reciprocatory sound receiver, of tablet displacing and replacing mechanism connected with the driving mechanism, and receiver elevating mechanism also connected with the driving mechanism, substantially as set forth.

11. In a talking machine, the combination with a frame, driving mechanism and sound receiver, of a tablet magazine, mechanism for operating the same, and mechanism for imparting synchronous rotation to a plurality of the tablets at the same time, substantially as and for the purpose specified.

12. In a talking machine, the combination with a frame and driving mechanism, of a sound receiver, a tablet magazine, and a plurality of synchronously rotatory tablet carriers, therein, substantially as set forth.

13. In a talking machine, the combination with a frame and driving mechanism, of an automatically continuously operative sound receiver, an intermittently operative magazine and a plurality of synchronously rotatory tablet carriers, substantially as set forth.

14. In a talking machine, the combination with a frame, driving mechanism and sound receiver operatively connected with the driving mechanism, of a tablet magazine and a plurality of synchronously rotatory tablet carriers also operatively connected with the driving mechanism, substantially as set forth.

15. In a talking-machine, the combination with a frame and driving mechanism, of an automatic alternately-reciprocatory sound receiver and an automatic intermittently operative cylindrical magazine connected with the driving mechanism, and a plurality of tablet carriers also connected with the driving mechanism, substantially as set forth.

16. In a talking machine, the combination with a frame, driving mechanism and automatically alternately reciprocatory sound receiver, of a cylindrical tablet magazine, and a plurality of synchronously rotatory tablet carriers thereon, substantially as set forth.

17. In a talking machine, the combination with a frame and driving mechanism, of an automatically alternately reciprocatory sound receiver, and an automatic intermittently operating cylindrical tablet magazine, and a plurality of tablet carriers thereon, substantially as set forth.

18. In a talking machine, the combination with a frame, sound receiver, and driving mechanism, of a tablet magazine and arm engaging with the tablet magazine to normally stay it, said arm located in the path of the sound receiver to be operated thereby, substantially as set forth.

19. In a talking-machine the combination with a frame, driving mechanism tablet magazine and counterweighted sound-receiver, of rotatory tablet-carriers in the magazine connected with the driving mechanism, mechanism also connected with the driving mechanism for automatically imparting motion to the magazine and to the tablet-carriers at intervals, respectively, and co-operative mechanism for raising and lowering the sound receiver away from or toward the tablet carriers, substantially as set forth.

20. In a talking-machine, the combination with a frame and driving mechanism, of a rotatory tablet magazine, a fixed gear thereon connected with the driving mechanism, rotatory tablet carriers carried by the magazine in operative relation to the carrier, and means connected with the driving mechanism for automatically staying the rotation of the magazine and transferring motion to the tablet-carriers, and vice-versa, substantially as set forth.

21. In a talking machine, the combination with a frame sound receiver driving screw and intermediate sound receiver support and irrevolvable sound receiver carrier, a screw-jaw pivotally carried upon the carrier and oppositely extending projection connected with the screw-jaw, and a lug upon the sound receiver adapted to engage with said projection to operate the jaw, substantially as and for the purpose specified.

22. In a talking machine, the combination with a frame and driving mechanism, of a rotatory magazine and gear connected therewith and with the driving mechanism and tablet carriers upon the magazine operatively connected with the gear, a reciprocatory sound receiver, a movable arm in the path of the sound receiver adapted to normally stay the motion of the magazine and to be released by the motion of the sound receiver, cams upon the magazine, and a lever adapted to be operated thereby, and a movable sound receiver carrier support connected with the lever, all to operate substantially in the manner and for the purpose specified.

23. In a talking machine, the combination with a frame, and driving mechanism, of a rotatory tablet magazine, a fixed gear thereon connected with the driving mechanism, rotatory tablet carriers carried by the magazine in operative relations with the gear, and an



automatically operative mechanism for alternately staying the rotation of the magazine or releasing it for the purpose of imparting motion to the tablet carriers, respectively, substantially as set forth.

24. In a talking-machine, the combination with a frame, driving mechanism, counter-weighted sound receiver, tablet magazine and rotatory tablet carriers in the magazine, of mechanism for imparting motion to the magazine, adapted thereby to raise and lower the sound receiver from or toward the tablet-carriers, substantially as set forth.

25. In a talking-machine, the combination with a frame, driving mechanism, counter-

weighted sound receiver, tablet magazine, and rotatory carriers in the magazine, of means for imparting motion to the magazine and mechanism co-operating with said means and connected with the driving mechanism to release the sound receiver and raise and lower the sound receiver away from or toward the tablet carriers, substantially as and for the purpose specified.

In testimony of all which I have hereunto subscribed my name.

JOSEPH L. ATKINS.

Witnesses:

C. P. ELWELL,

LOUIS G. JULIHN.