

(No Model.)

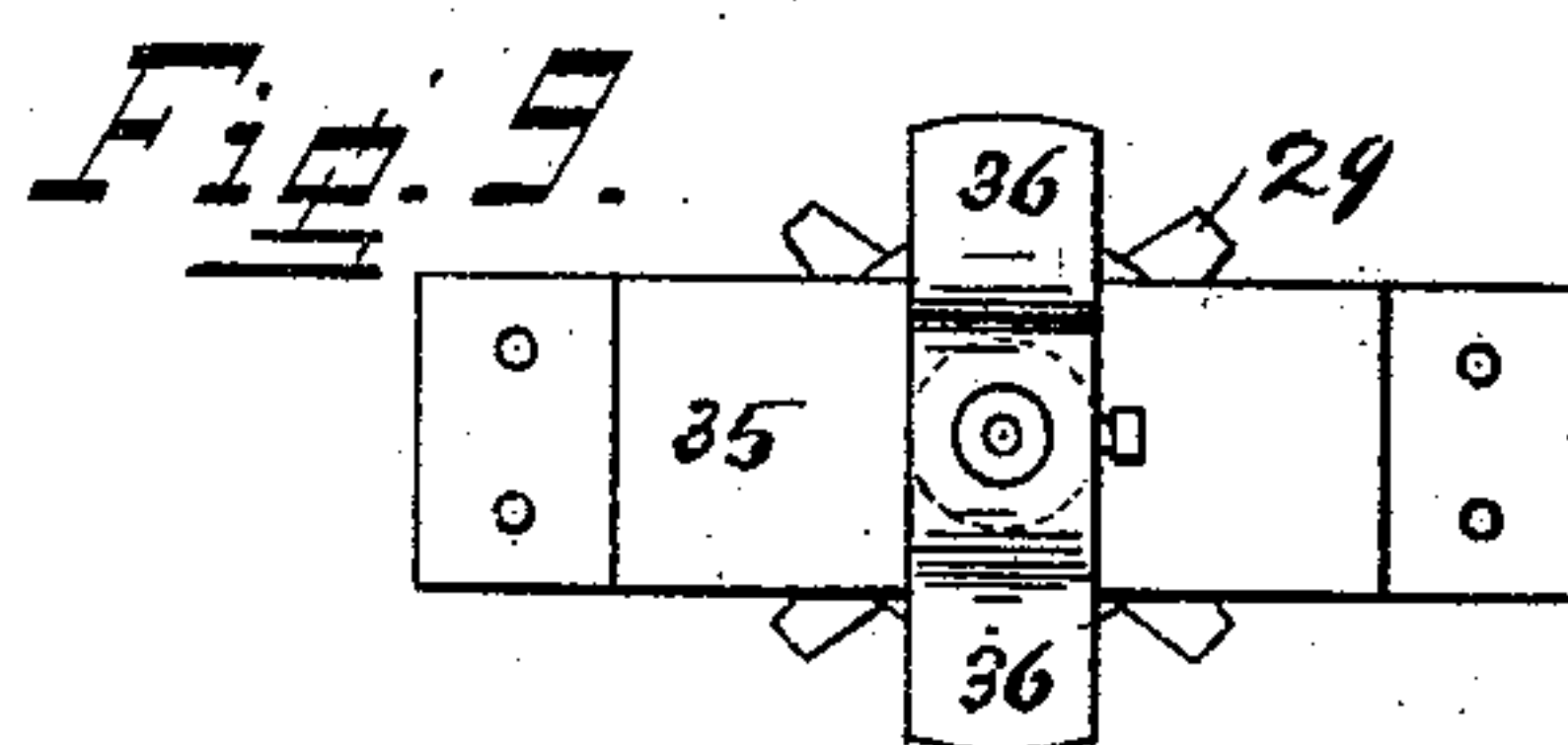
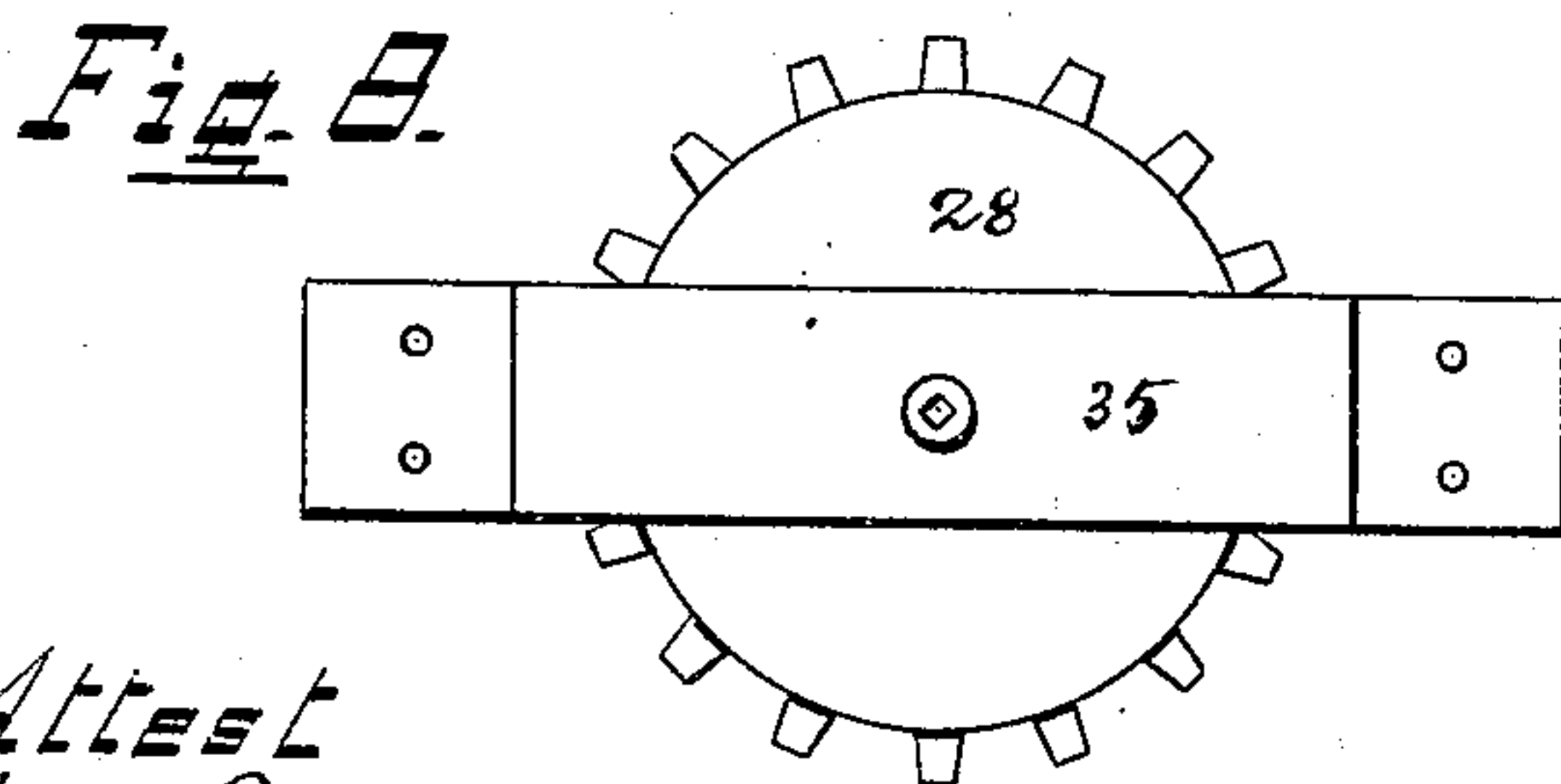
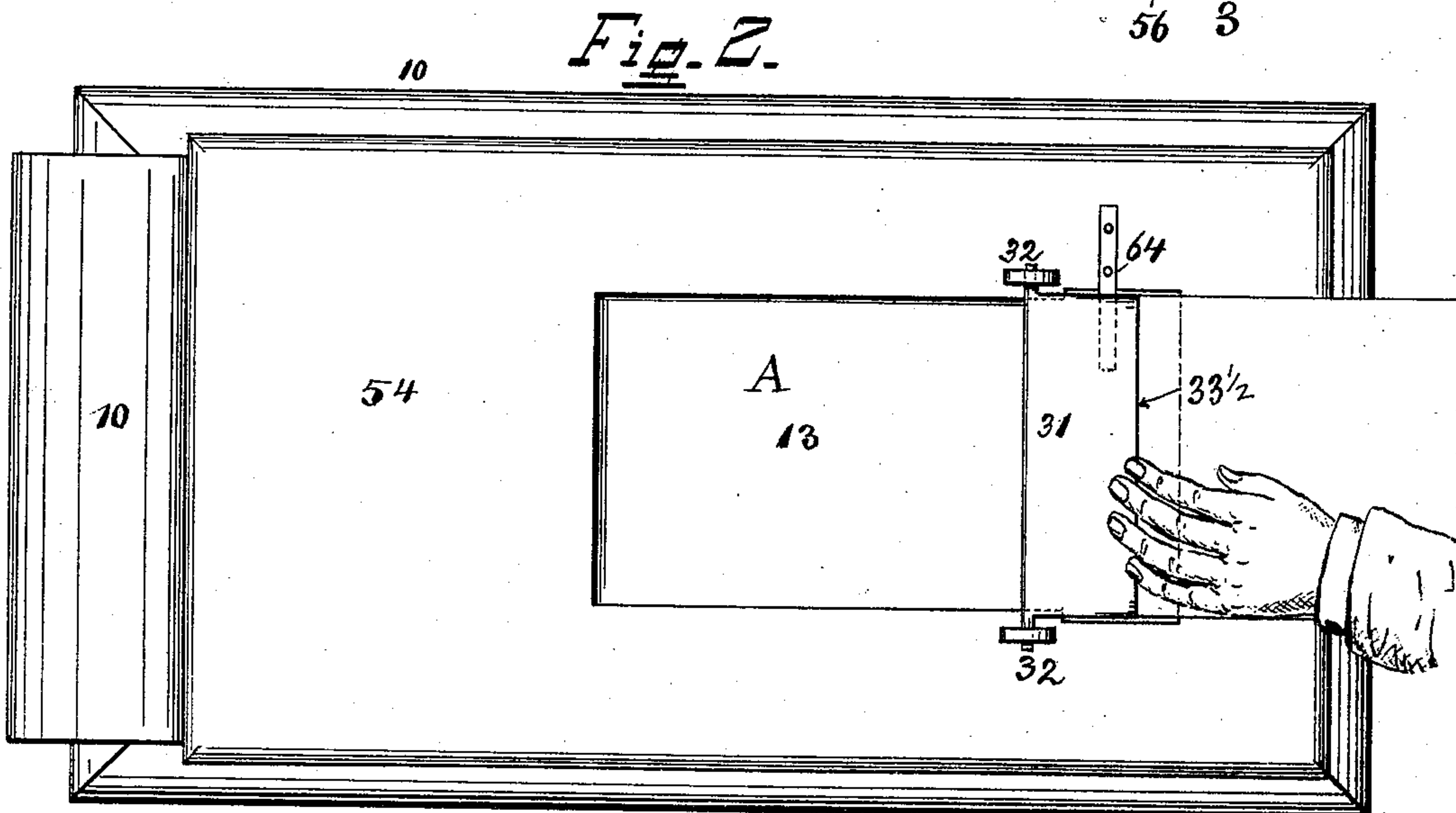
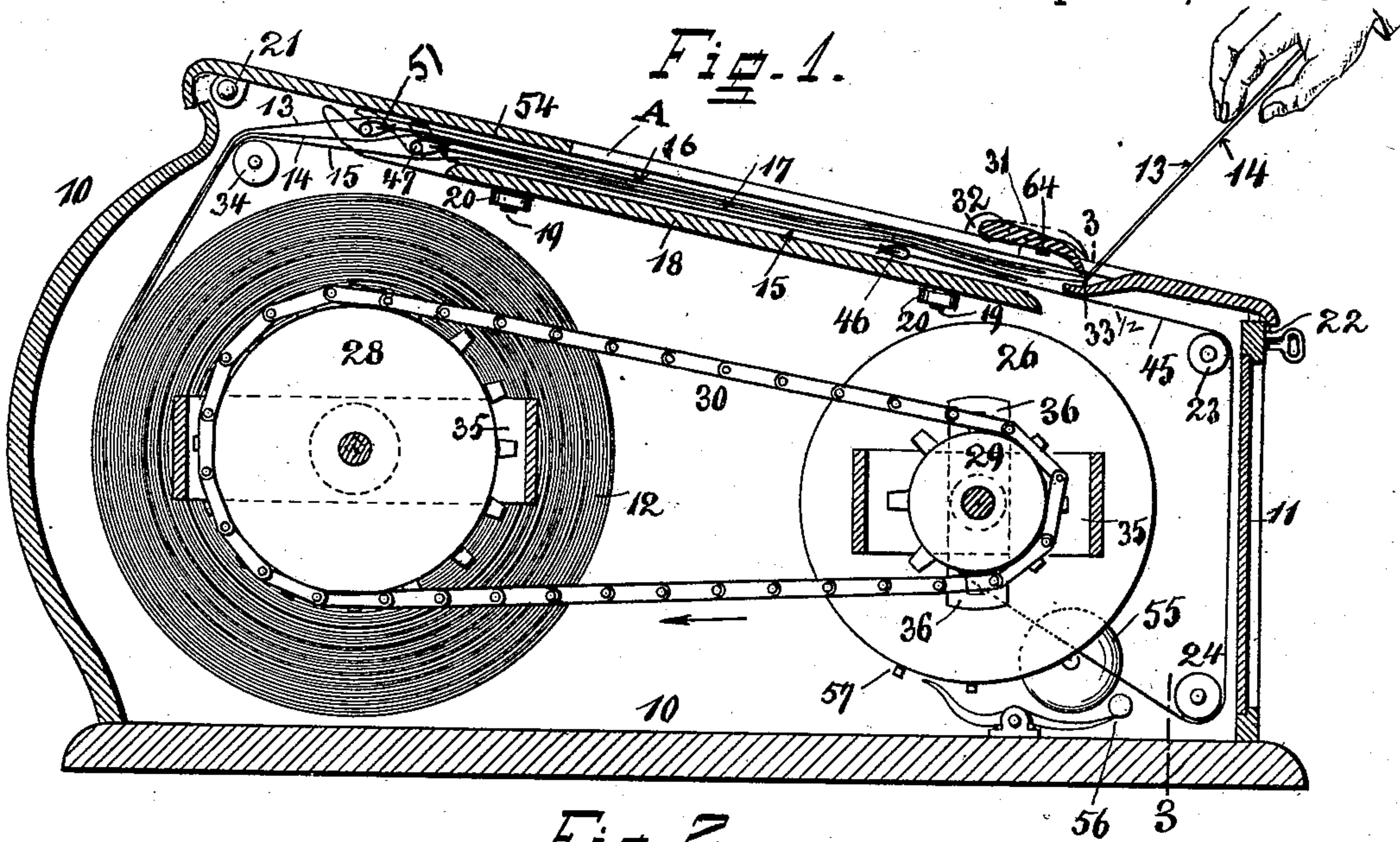
2 Sheets—Sheet 1.

A. LE G. PEIRCE.

AUTOGRAPHIC COPYING AND RECORDING APPARATUS.

No. 472,743.

Patented Apr. 12, 1892.



Attest  
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H. Smith

Inventor  
Almy Le Grand Peirce

(No Model.)

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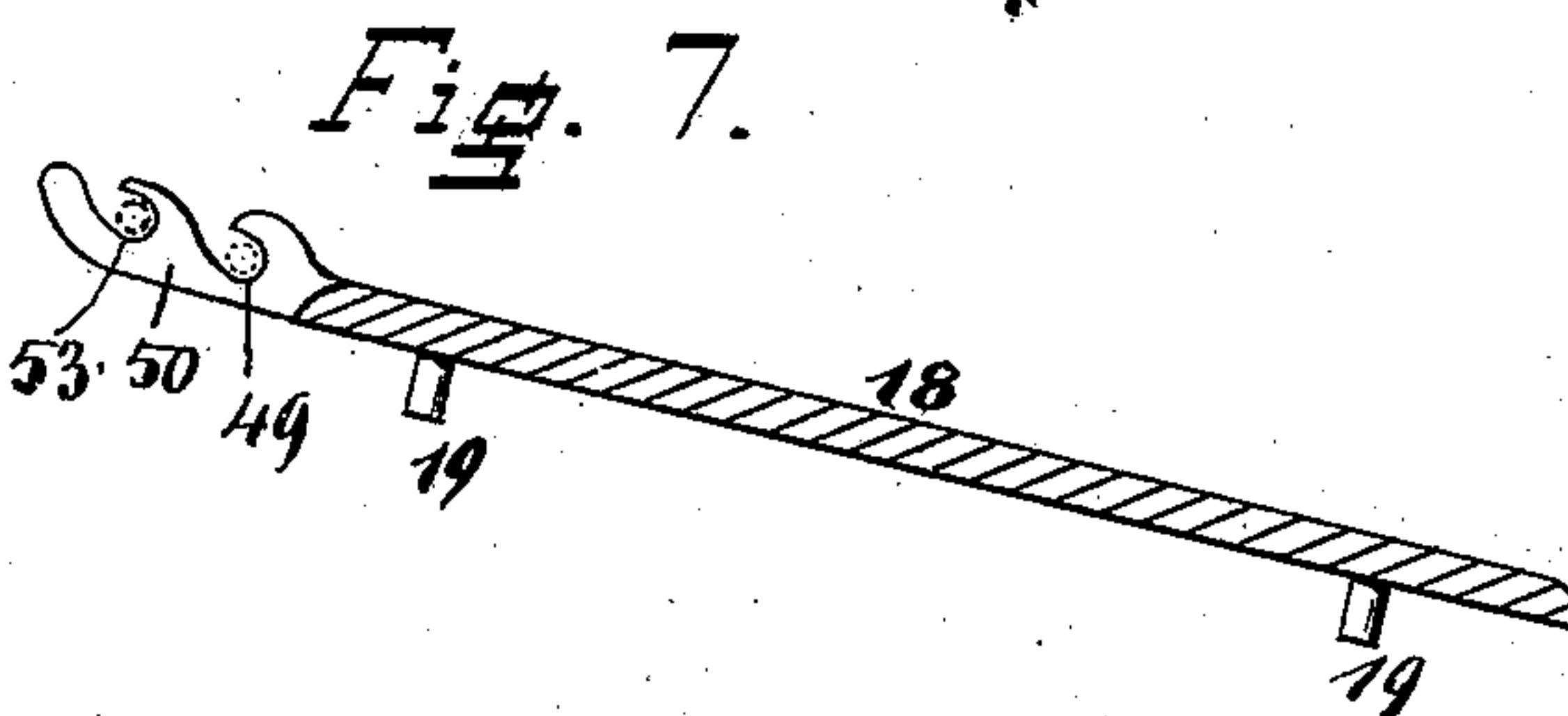
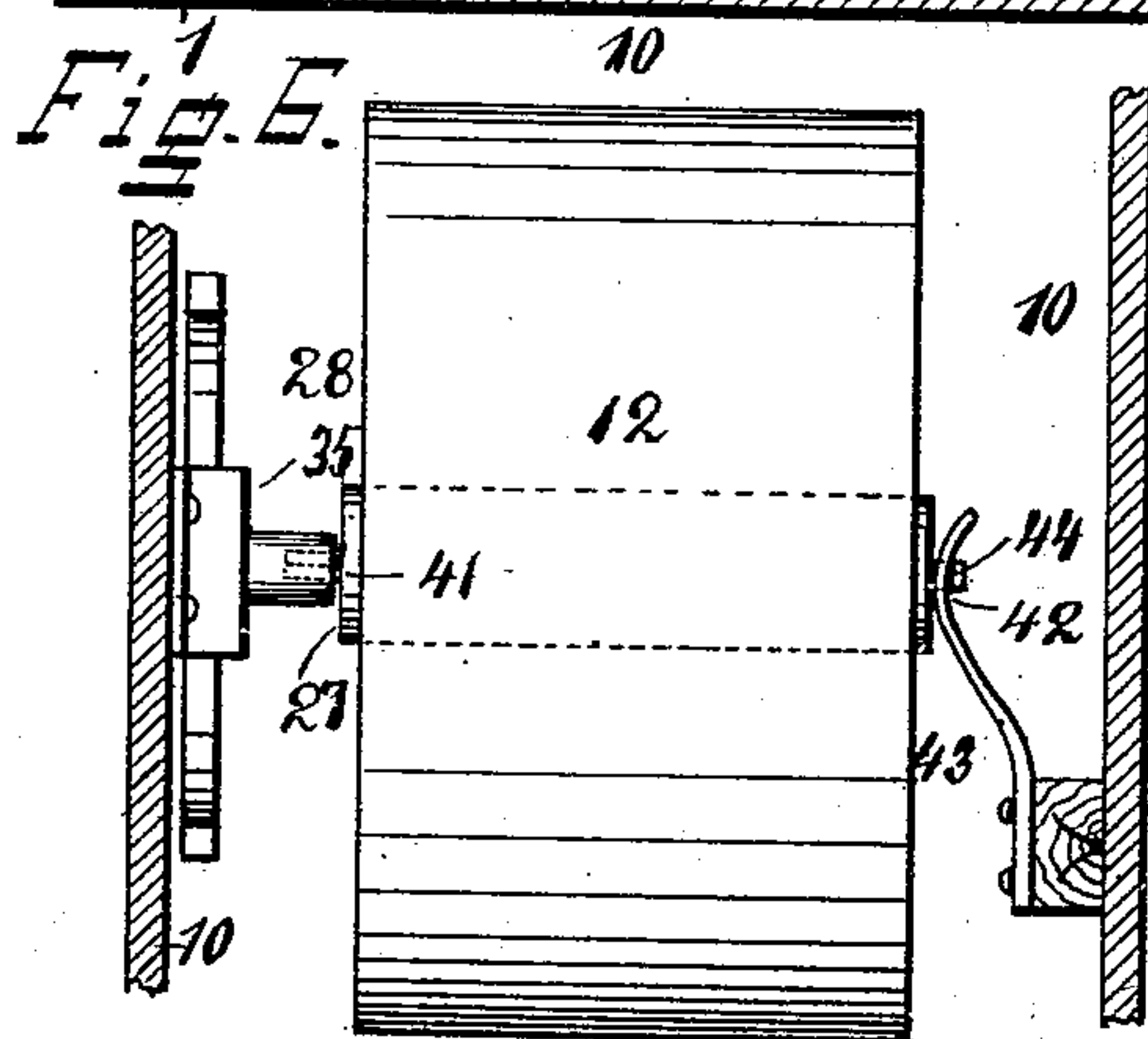
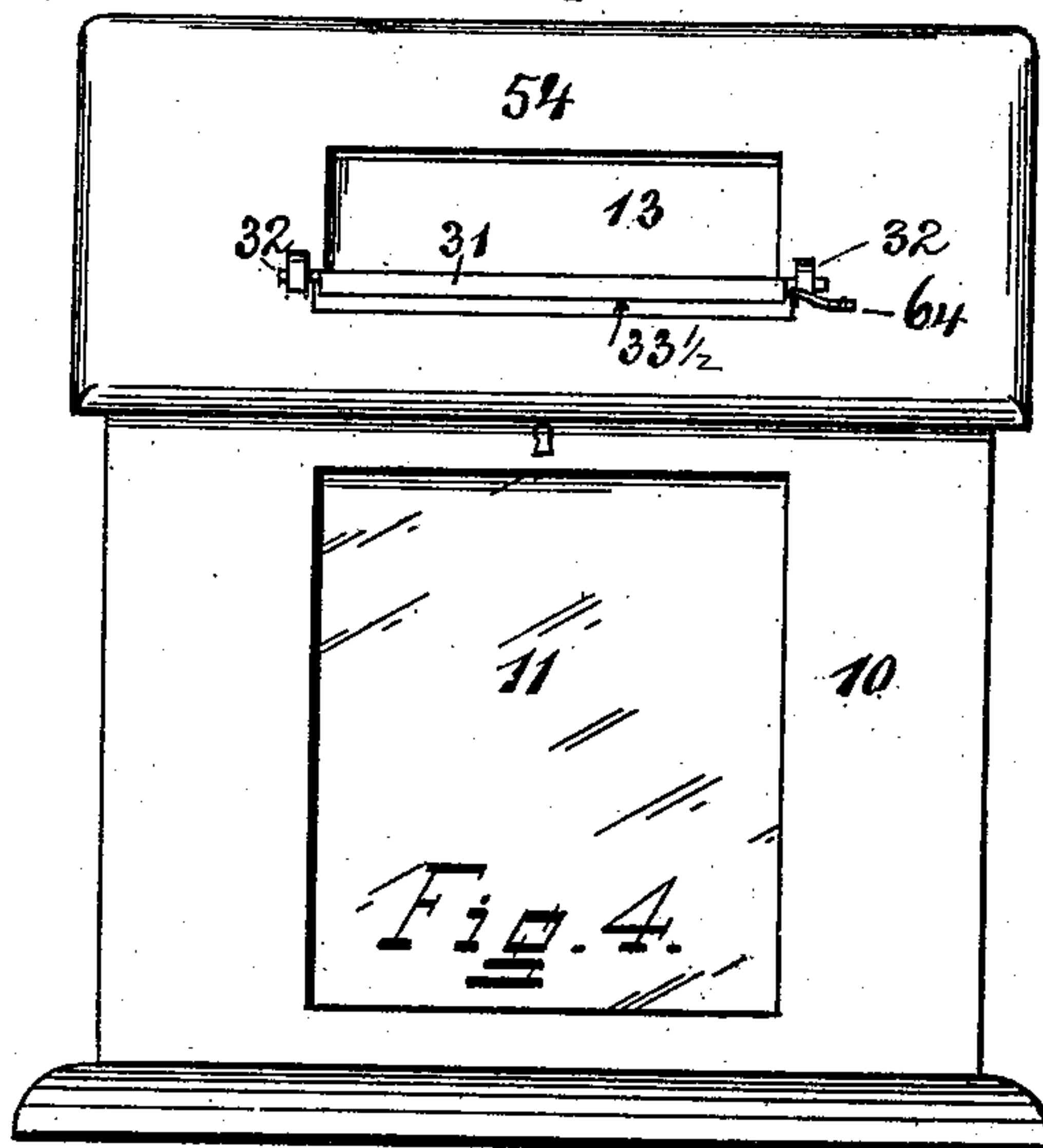
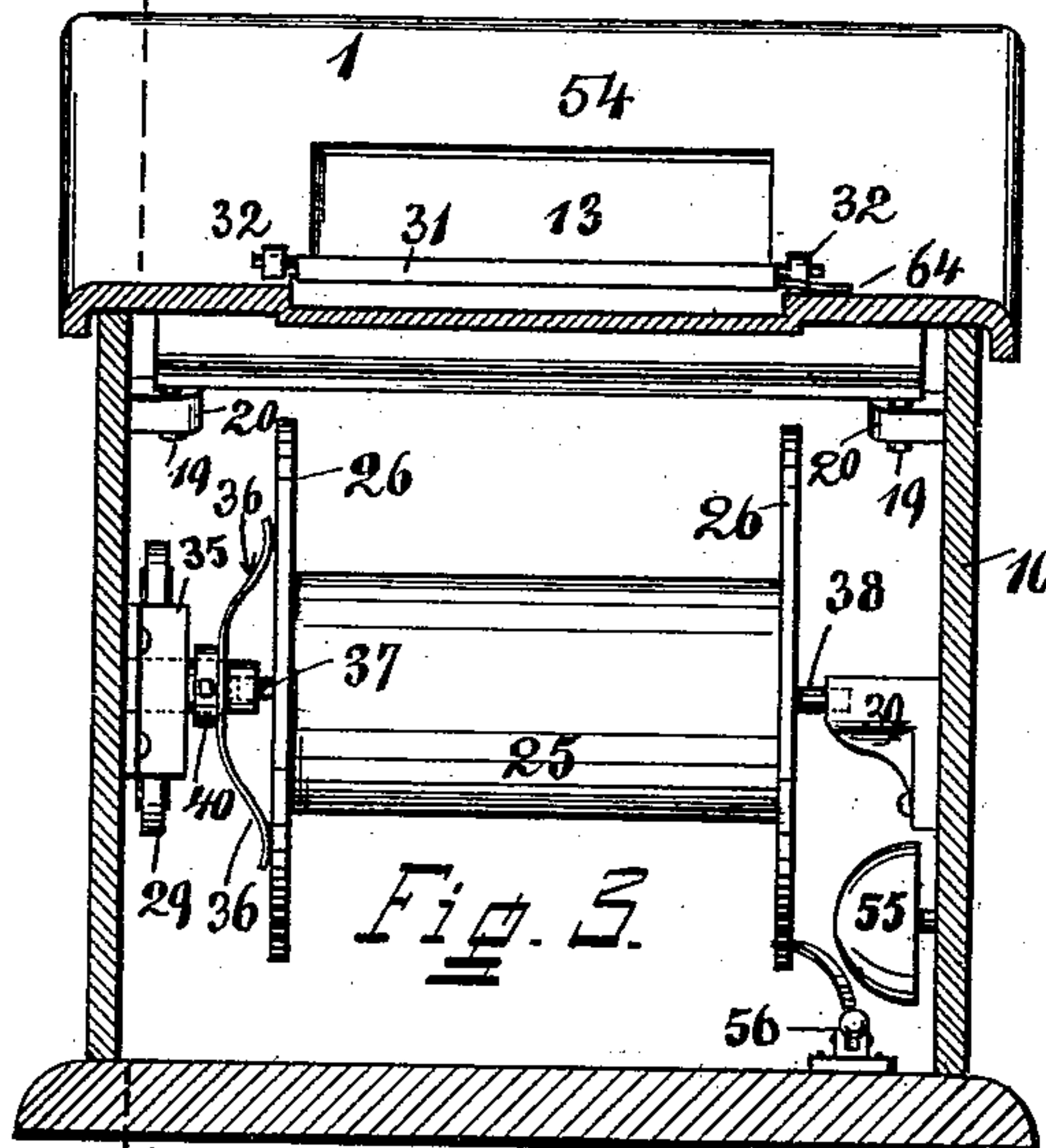
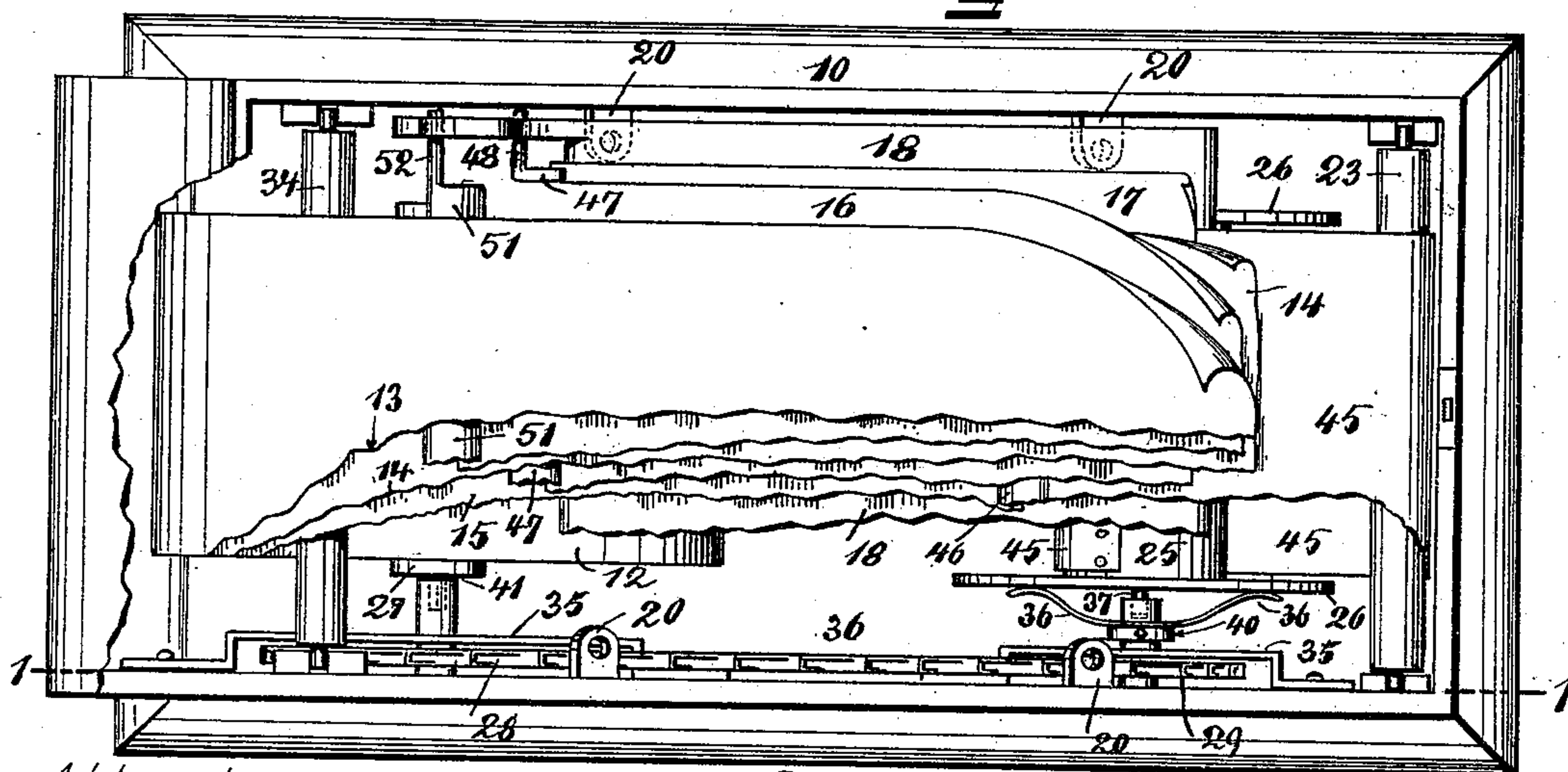


Fig. 5.



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# UNITED STATES PATENT OFFICE.

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DIRECT AND MESNE ASSIGNMENTS, TO THE WILSON IMPROVED  
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## AUTOGRAPHIC COPYING AND RECORDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 472,743, dated April 12, 1892.

Application filed October 22, 1890. Serial No. 368,941. (No model.)

*To all whom it may concern.*

Be it known that I, ALMY LE GRAND PEIRCE, a citizen of the United States of America, and a resident of the city of Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Autographic Copying and Recording Apparatus—that is, a class of devices where simultaneously with the writing of one document one or more identical copies of the original are produced—of which the following is a specification.

These devices are generally used in stores and offices where a record is made of all such business transactions as orders, sales, &c., and where it is desirable to have more than one copy of the same—one or two for immediate use and one being retained with the apparatus for future reference in case disputes or misunderstandings arise—serving, also, as a guard against irregularities and negligence on the part of employes, because the copying and recording preservation of the writing is beyond their access and control and transpires simultaneously with the writing and removal of the original document.

The invention consists in the features of construction and arrangement, substantially such as more particularly set forth.

In the accompanying drawings, making a part of this specification, and to which reference is hereby made, Figure 1 is longitudinal section through the machine, taken on line 1 of Figs. 3 and 5. Fig. 2 is a top view of the device. Fig. 3 is a section on line 3 3 of Fig. 1. Fig. 4 is a front view of the machine. Fig. 5 is a top view of the device with cover removed and parts broken away to expose the interior. Fig. 6 is a front view of the paper roll, showing also the supports of the same. Fig. 7 is a longitudinal section of the tablet. Figs. 8 and 9 are elevations of the two sprocket-wheels, showing them as they appear while viewed from the inside of the box.

10 is the body of the apparatus, consisting of bottom and four sides, of any suitable material—iron, wood, &c. The front side 11 is provided with an opening, which exposes to view the record made of a transpired trans-

action during the interval preceding the next

transaction. This opening is preferably covered with glass or other transparent substance.

12 indicates a supply-roll of paper. This roll consists of as many strips in one layer wound upon it as copies are needed. The advantages of this roll so made up will be hereinafter fully apparent. The least number of copies required is two—one for immediate use and one to be preserved on the record-drum. Ordinarily, however, three copies are desired—two of these copies for immediate use and the other for preservation on the record-drum. In such cases three strips of paper are used, as shown in the drawings and indicated by 13 14 15. 13 indicates the top strip and is the one on which the operator directly writes. 14 indicates the next strip and on this strip the characters written by the operator on strip 13 are (as he writes them) impressed or marked by means of a sheet of transfer-paper 16, interposed between this strip 13 and the said strip 14. Immediately behind or under strip 14 is another sheet of transfer-paper 17, by means of which a copy on the record-strip 15 is produced. The latter strip is located immediately behind or under the transfer-paper 17. All these strips after leaving roll 12 pass over a guide-roller 34 and onto the writing-tablet 18. The preferred mode of upholding this tablet is, as shown, by pins 19, extending from its under side and engaging with lugs 20, extending inwardly from the sides of the body.

The top strip is covered by the cover 54 of the machine, which is removable, and a preferred means for enabling it to be easily removed and replaced is as follows: The cover 54 is hinged at 21 to the rear side of the body and secured by a lock 22. The opening of this cover gives access to the interior of the box. A rectangular opening A, somewhat smaller and within the margin of the tablet 18 below it, is provided in the cover and indicates the limit of the space which may be covered by writing. The two upper strips 13 and 14 pass out from the box below or at the lower end of this opening, while the record-strip 15 passes on the inside of the box and over guide-rollers 23 and 24 onto the record-



ing-drum 25. This latter has flanges 26 to prevent an uneven accumulation thereon.

A valuable feature of construction consists in the combination of the mandrel 27, carrying the paper roll aforementioned, and a second mandrel or drum 25, on which latter is wound the record-strip 15, and suitable means for enabling the withdrawal of the strip or strips, as 13 and 14, from the apparatus to automatically rotate the mandrel 27, and, through the agency of the latter, rotate in unison the said mandrel or drum 25. A preferred means for accomplishing such rotation is as follows, viz: The mandrel 27 of the paper roll, as well as the drum 25, are connected each with a sprocket-wheel 28 and 29, the wheel 28 on the paper roll being in the present instance about twice the size of the one 29 on the receiving-drum and transmits motion to sprocket 29 by means of an endless chain 30. The diameter of the sprocket-wheel 28, attached to the mandrel 27, in relation to the diameter of the sprocket-wheel 29 of the mandrel 25 is in general so proportional to the diameter of the respective mandrels that the mandrel 25 shall be compelled to rotate at a speed such as shall wind the record-strip 15 on the mandrel 25 as fast as it is unwound from the mandrel 27 of the paper roll. The chain and these sprocket-wheels, in connection with the supplemental mechanism hereinafter specified, enable this operation to be accomplished with great accuracy and success.

31 is a flap hinged at 32 to either side of the opening in the cover and is provided with a knife-edge 33. This latter is ordinarily kept somewhat off the top by means of a spring 64. (See dotted lines in Fig. 1.)

Below the edge of the cutter 31 is a cutting board or surface 33½. This surface is inclined downward toward the rear of the machine, and the edge of the cutter while in use strikes this incline preferably near the bottom of the latter, it being understood that when in use the strip of paper 13, before being severed, lies between the cutting-edge of the cutter and the surface of the said cutting-board 33½.

The general operation is as follows: The particular business transactions having been noted on the paper within the opening in the top, producing simultaneously two copies below, flap 31 is raised to permit the edges of strips 13 and 14 being taken hold of. They are next pulled out to the required length until all the written matter appears drawn out from under the flap, which latter is now depressed with one hand to bring its knife-edge down onto the paper, where it is held until the other hand tears the strip off. While the two strips are being pulled out roll 12 is revolved, correspondingly rotating the sprocket-wheel 28 and by means of endless chain 30 causing the other sprocket-wheel 29, with the receiving-drum 25, to revolve also. The latter, having the lower or record strip 15 connected to it, causes the same to be wound upon it. As will be seen, sprocket 29 and drum 25 are

about of an equal diameter, which latter is approximately one-half the size of the diameter of the sprocket-wheel on the supply-roll. The effect of this arrangement is that the receiving-drum, being smaller than the paper roll is at the beginning, revolves faster than the latter in order to fully take up the amount of paper unwound. The combined record-roll, consisting of the receiving drum or mandrel 25 and its enveloping strip of record-paper wound thereon in layers, increases in diameter as the record-paper is wound thereon. On the other hand, the combined supply-roll formed by the mandrel 27 and the supply-paper thereon, correspondingly decreases in diameter as the strips of paper are unwound therefrom. As the supply-roll thus decreases and the diameter of the receiving-drum increases by the accumulating paper thereon the original proportion between the amounts of the paper discharged and wound does not harmonize any more with the constant proportion of speeds between the two sprocket-wheels. To equalize this unevenness and to prevent tearing of the paper by the receiving-drum, which as the paper accumulates thereon takes up more paper than the revolution of the mandrel 27 of the paper-supply roll would through the rotation of the sprocket-wheel supply, the connection between the sprocket 29 and drum 25 is not rigid, but obtained by frictional contact of such a degree that the drum 25 slips away from the sprocket-wheel whenever the speed of the latter is faster and in disproportion to the paper unwound from the supply-roll. The details of a construction to enable the said drum 25 thus to slip are as follows: The inner ends of the shafts of the sprocket-wheels revolve in frames 35 and extend through them. Two or more springs 36 are rigidly secured to this end of the shaft of sprocket 29, which shaft has also a round opening in its end, running inwardly in the direction of the axis of said shaft and fitted to receive a pivot-pin 37, extending out from drum 25. In placing this drum in position its flange 26 adjacent to the springs 36 is placed against their free ends and pushed toward sprocket 29 until pin 37 enters its socket in the sprocket-wheel shaft and the other pivot-pin 38 at the opposite end of the drum is enabled to enter its socket-bearing 39. The socket in this bearing is not deep enough to permit springs 36 to fully expend their energy when the drum is released, but so proportioned in depth that it holds the latter against them and produces thus the frictional contact, the purpose of which has already been explained. Springs 36 are secured to the collar 40, which by means of a set-screw may be adjusted laterally on the sprocket-wheel shaft in order to permit the regulation of the frictional contact to its proper degree. In case of the supply-roll the socket in the shaft of the sprocket-wheel 28 is square, in order to produce with the correspondingly-shaped end 41 of the mandrel of the said roll a posi-



tive connection. The other bearing 42 for the remote end of this roll is circular and located at the free end of a spring 43. In placing the paper roll in position its round pivot 5 44 is placed first in this spring-bearing, which is now pressed outwardly until the square end 41 is enabled to enter its socket, after which the roll may be released, the spring-bearing keeping it in its proper place. While the 10 supply-roll and receiving-drum are thus placed in their respective positions the top of the machine is open and the tablet 18 removed. The paper from the supply-roll is connected to the receiving-drum in a suitable 15 manner. A preferred mode and means of my invention for making such connection is as follows: Enough paper is unwound and passed over guide-roller 34 to reach about half-way over the writing-tablet 18, if it were in 20 its proper position. A band 45, having a spring-clamp 46 connected to it and secured to drum 25, is unwound from it and passed upwardly around guide-rollers 23 and 24. The ends of the unwound paper, as well as the 25 band 45, are turned outwardly over their respective adjacent ends of the box, so as to be out of the way for the purpose of placing the tablet 18 in its proper position. The inner one of the three paper strips, which is the 30 record-strip 15, and band 45 are now brought over the tablet and connected to each other by means of spring-clamp 46, which is opened and grips the paper. Any slack which may be in the paper or band is taken out by turning the paper roll in such a direction as to 35 take it up. Next a sheet of transfer-paper 17, secured to a spring-clamp 47, is put in position by placing the latter's reduced ends 48 into notches 49, cut into an extension 50, which 40 reaches out from the writing-tablet. The middle strip 14 is now drawn over the smoothed transfer-paper and another sheet of transfer-paper 16, secured to a similar clamp 51, also having reduced ends 52, is placed into notches 45 53, cut into extension 50. It is smoothed and the top sheet 13 is drawn over it, after which cover 54 may be brought down and locked, putting the apparatus in ready condition for use.

The signal consists of a bell 55 and a bell-hammer 56, the free end of which reaches 50 into the path of one or more pins 57, secured to one of the flanges 26 of the receiving-drum 25. During the revolution of the drum these pins come in contact with the bell-hammer, 55 which strikes the bell as many times as there are pins. Where there are more than one of these copying and recording apparatuses in use in one establishment, the number of these pins may be varied, so as to indicate by the 60 number of sounds the particular apparatus which has been operated. The same object might be accomplished by differently-sounding bells. As will be seen, the pulling out of the two top strips causes the bottom or record 65 strip to be wound by setting the particular mechanism described in motion. This is attained by the peculiar way of winding the

different paper strips onto one supply-roll, as explained before. The transfer-sheets, being left free at their lower ends, can never ruffle, 70 because the paper strips while passing over them keep them constantly smooth.

The mechanical connection between supply-roll and receiving-drum may be accomplished by any means different from the 75 sprocket wheels and chains, but their equivalents. Thus, for instance, a train of cog-wheels might be used to advantage for the same purpose.

While the various features of my invention 80 are preferably employed together, one or more of said features may be used without the remainder, and in so far as applicable one or more of said features may be employed in connection with other autographic copying 85 and recording apparatus.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. In a copying and recording apparatus, the storage-drum upheld at one end by a journal-bearing and at the other end provided 90 with friction-disk fixedly secured thereto, and a sprocket or gear wheel provided with spring-arms or elastic spider fixedly secured to said sprocket-wheel and rotated therewith, and a 95 single journal upholding the said sprocket-wheel, springs, and the adjacent end of the storage-roll and friction-plate, the said journal being provided with a shoulder bearing against the end of the roller, while its journal enters a center opening therein, and the 100 adjustable nut 40, located on the shaft outside of the springs and secured to said shaft by a set-screw for enabling the sprocket-wheels and springs to be separated more or 105 less from the friction-plate and the amount of friction between the friction-plate of the drum and the springs thus to be regulated, substantially as and for the purposes specified. 110

2. The tablet on which lies the memorandum-paper, and the hinged-flap cutter pivotally connected to the apparatus and whose cutting-edge extends across the machine, the rear or hinged edge of the flap being sufficiently elevated for the paper to pass under- 115 neath without being frictionally retarded thereby, and the cutting board or surface 33½, located immediately beneath the flap 31, the paper to be cut being drawn out from be- 120 neath the flap and up out over the said cutting-board, substantially as and for the purposes specified.

3. The tablet on which lies the memorandum-paper, and the hinged-flap cutter pivotally connected to the apparatus and whose cutting-edge extends across the machine, the rear or hinged edge of the flap being sufficiently elevated for the paper to pass under- 125 neath without being frictionally retarded thereby, and spring 64, bearing against the cutter-flap, and the anvil or cutting-board 33½, located beneath the cutting-edge of the flap, the paper when drawn out to be cut lying on 130



the cutting-board and beneath the cutting-edge of the flap, the spring 64 keeping the cutting-edge of the flap cutter elevated off the paper, except when depressed by the operator in the act of cutting the paper, substantially as and for the purposes specified.

4. The tablet on which lies the memorandum-paper, provided with the hinged-flap cutter, whose cutting-edge extends across the machine, the rear or hinged edge of the flap being elevated and the paper passing beneath the flap, the flap being curved or arched in cross-section, the cutting end portion of the flap extending downward, and the cutting board or surface 33 $\frac{1}{2}$ , having the inclined face upon which the paper to be cut lies while the cutting-edge of the flap presses on the paper in the operation of severing the latter, substantially as and for the purposes specified.

5. The tablet on which lies the memorandum-paper, provided with the hinged-flap cutter, whose cutting-edge extends across the machine, the rear or hinged edge of the flap being elevated and the paper passing beneath the flap, the flap being curved or arched in cross-section, the cutting end portion of the flap extending downward, and the cutting board or surface 33 $\frac{1}{2}$ , having the inclined face upon which the paper to be cut lies while the

cutting-edge of the flap presses on the paper in the operation of severing the latter, and the spring 64, elevating the cutting-edge of the cutter from the cutting-board and paper, except when depressed by the operator to sever the paper, substantially as and for the purposes specified.

6. The tablet on which lies the memorandum-paper, and the hinged-flap cutter pivotally connected to the apparatus and whose cutting-edge extends across the machine, the rear or hinged edge of the flap being sufficiently elevated for the paper to pass underneath without being frictionally retarded thereby, and the cutting board or surface 33 $\frac{1}{2}$ , located immediately beneath the flap 31, the paper to be cut being drawn out from beneath the flap and up out over the said cutting-board, the apparatus having an open top space whereby the upper surface of the strip 13 of paper is exposed to be written upon and the cutting-edge of the cutter-flap and the cutter-board being located between said open space and the front or delivery end of the said machine, substantially as and for the purposes specified.

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Attest:

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