

E. THÜREY.
TYPE WRITING MACHINE.
APPLICATION FILED SEPT. 5, 1907.

925,530.

Patented June 22, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

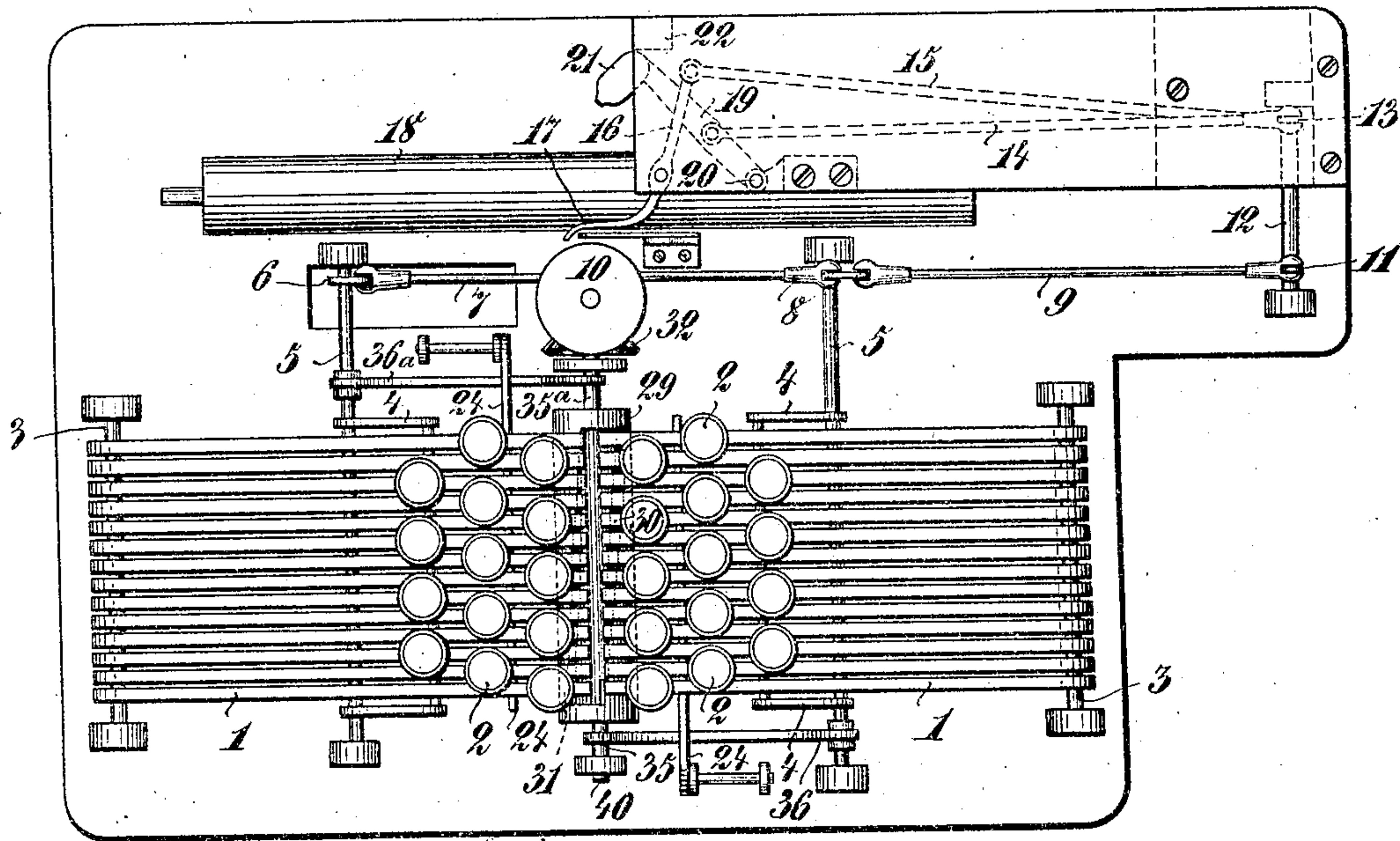


Fig. 2.

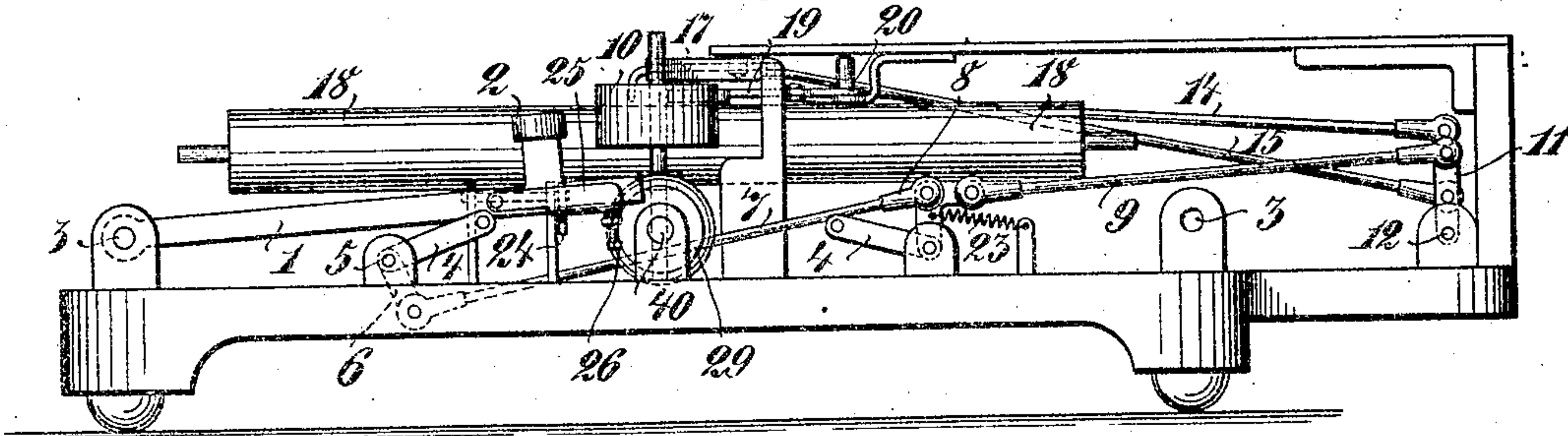
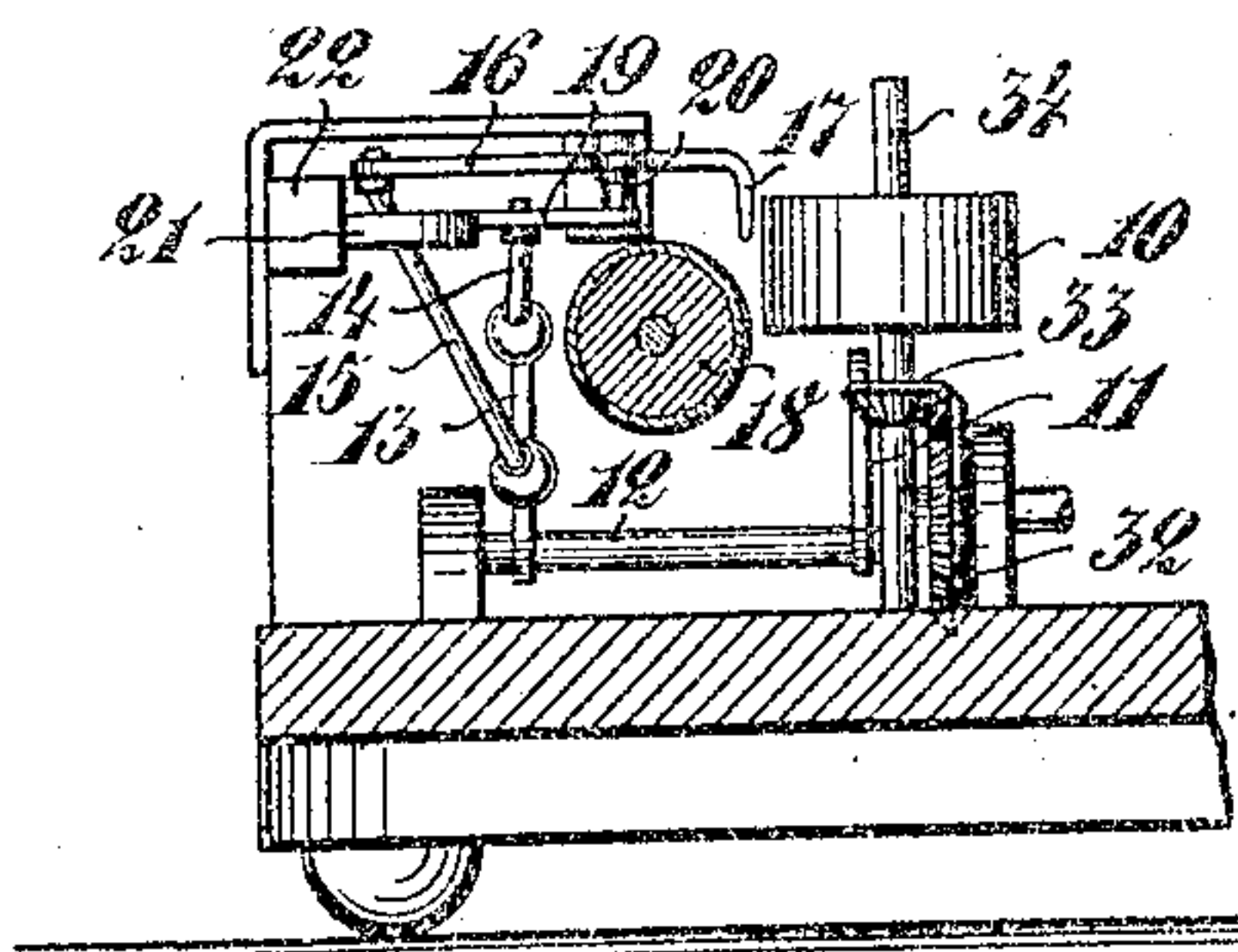


Fig. 3.



WITNESSES
W. P. Brunk
G. J. Heerbrandt

INVENTOR
Edward Thürey
BY M. M. M. M.

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2 SHEETS—SHEET 2.

Fig. 4.

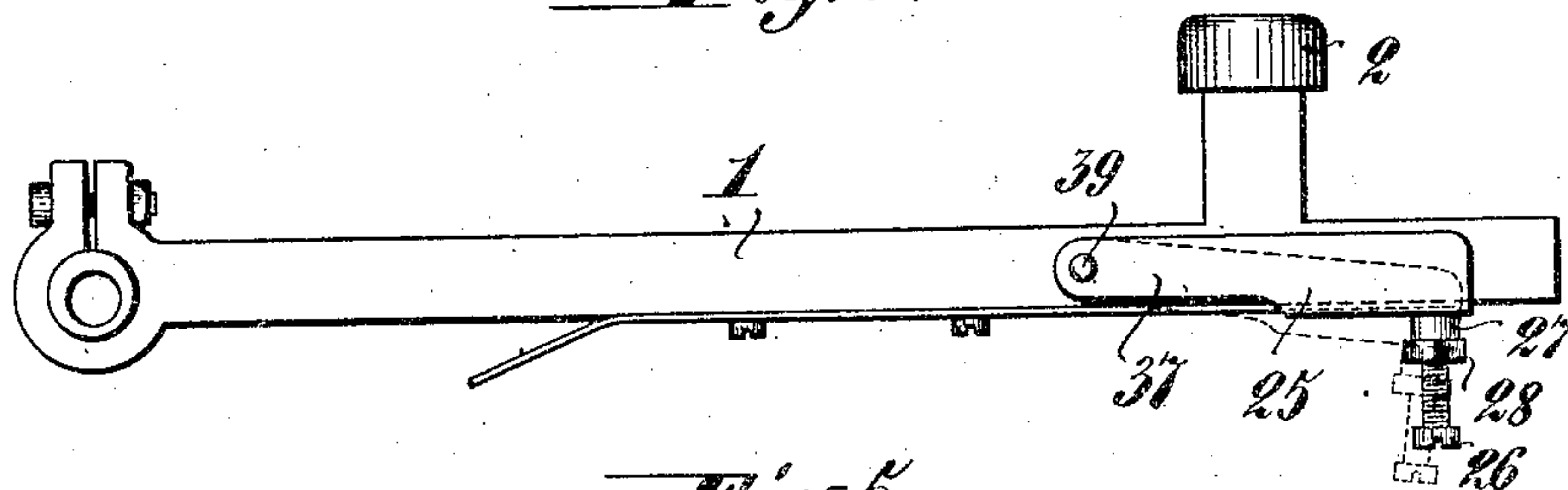


Fig. 5.

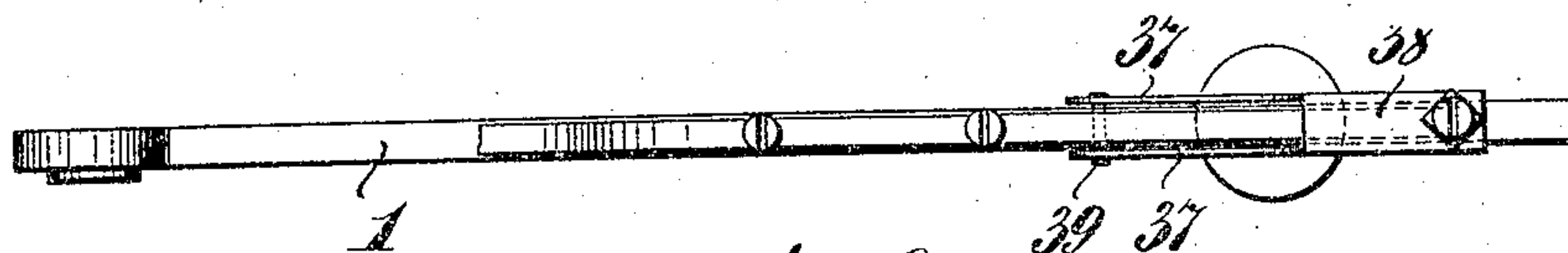


Fig. 6.

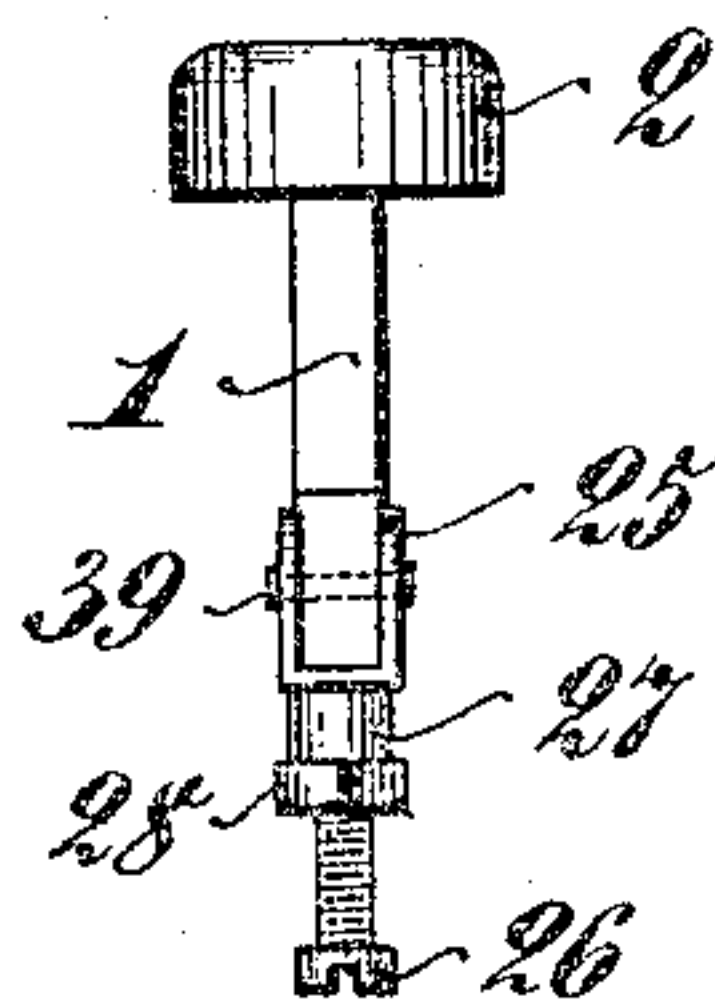


Fig. 7.

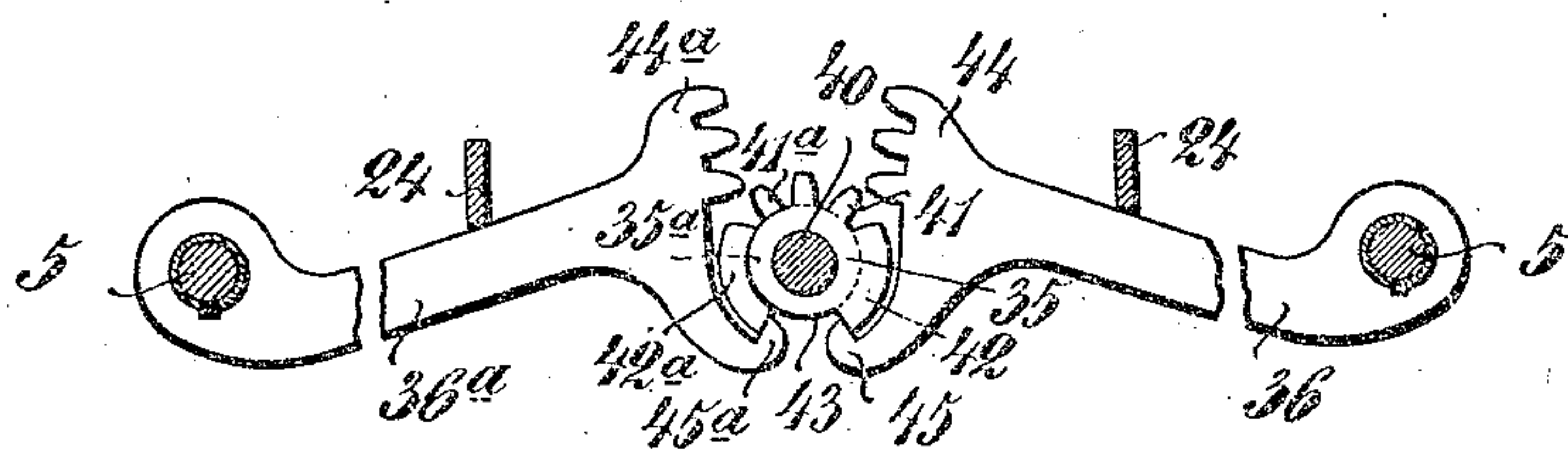
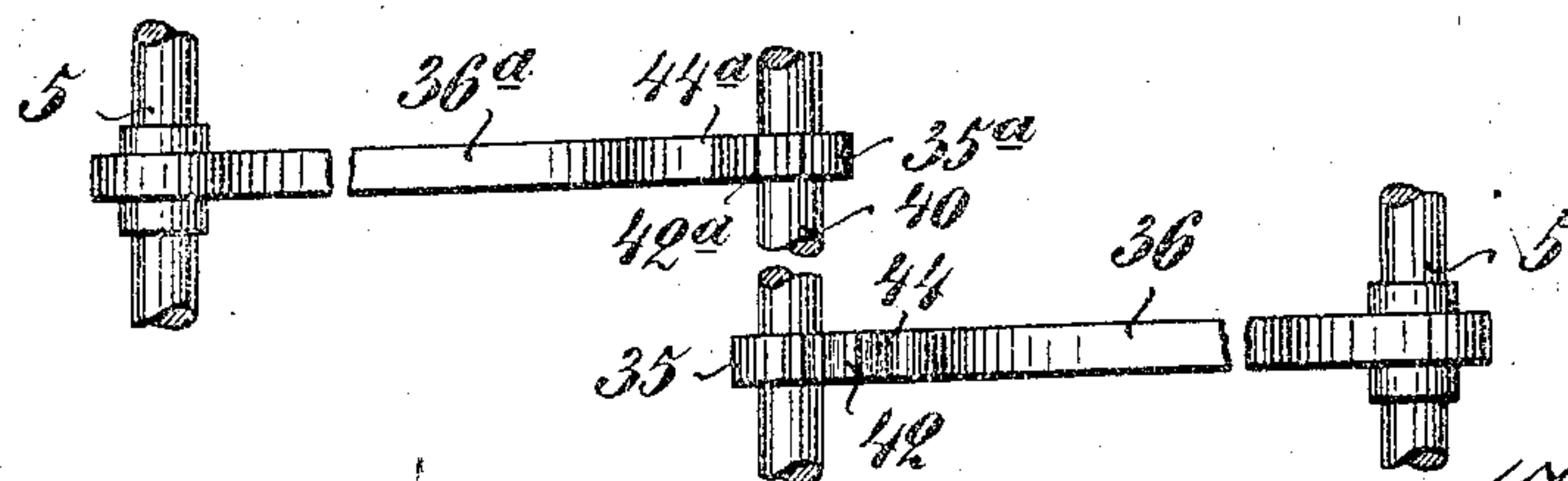


Fig. 8.



WITNESSES

W. P. Bunk
G. Heerbrandt

INVENTOR

Edward Thürey
BY *M. J. Mann* M.D. ATT'Y.

UNITED STATES PATENT OFFICE.

EDUARD THÜREY, OF KALK, NEAR COLOGNE, GERMANY, ASSIGNOR TO THE ASSOCIATION THÜREY-SCHREIBMASCHINEN-GESELLSCHAFT MIT BESCHRÄNKTER HAFTUNG, OF COLOGNE, GERMANY.

TYPE-WRITING MACHINE.

No. 925,530.

Specification of Letters Patent.

Patented June 22, 1909.

Application filed September 5, 1907. Serial No. 391,489.

To all whom it may concern:

Be it known that I, EDUARD THÜREY, of Kalk, a citizen of the free city of Hamburg, and whose post-office address is No. 11 Neuerburgstrasse, Kalk, near Cologne, Prussia, German Empire, have invented new and useful Improvements in Type-Writing Machines, of which the following is a specification.

10 This invention relates to type-writing machines having the types carried by cylinders, wheels, or other movable carrier, and it has for its object to insure the certainty of action of the type-carrier and hammer, or
15 device by which the paper is brought into contact with the type, and to provide means whereby changes due to the wear of the parts are compensated for, as it is important that the various devices of the whole
20 machine should coöperate in a definite and exact manner, as otherwise good and uniform impressions cannot be obtained.

The improvements can be applied without the general arrangement, and especially
25 to usual normal feed of the paper, having to be altered.

I will describe my invention with reference to the accompanying drawings.

30 Figure 1 is a plan of the machine, the parts which are not required to be shown for the explanation of the invention being omitted; Fig. 2 is a front elevation; Fig. 3 is a side view, partly in section, of the rear part of the machine; Figs. 4, 5 and 6 show
35 separately, and drawn to a larger scale, the regulating device for the key-levers, and Figs. 7 and 8 show, also drawn to a larger scale, the device for actuating the type-carrier.

40 In key-board type-writing machines, in which the type-wheel does not itself strike against the paper, it is necessary to employ a hammer, plunger, or the like, (I will refer to it as the hammer), which presses the
45 paper from behind against the types of the type-carrier which are brought into position for printing. As the sheet of paper, on account of its movability upward, downward, and from side to side, requires a comparatively large amount of space, some difficulties are experienced in transmitting the
50 movement of the keys to the hammer.

In known arrangements the transmission members are run directly below the carriage
55 straightway to the hammer, but this necessi-

tates change in the normal feeding of the paper which must be introduced from behind, and accessory devices become necessary. Both this mode of feeding the paper and the accessory devices are open to objection. In order to retain the convenient normal feeding of the paper, the horizontal spindle of the hammer, which lies in a vertical plane, has been so far extended that it is possible to go around the space taken by
60 the paper, and behind the paper a spindle has been arranged in a direction parallel to the arbor of the hammer, the keys imparting a rotary motion to this spindle, which motion is transmitted to the arbor of the hammer by a link arrangement, but this device
70 has disadvantages which it is the purpose of this invention to obviate, while at the same time the normal feeding of the paper is retained, the use of elastic members being
75 dispensed with, so that an instantaneous and direct transmission of the motion is effected. In the older arrangement the long rod-guide causes a certain amount of
80 springiness because the various parts must not be made too heavy, and this springiness retards the transmission of motion, thereby affecting the speed of the machine. In addition to this a part of the power exerted is lost, so that the quality and number of
85 copies obtainable are not such as is desired.

The machine in accordance with this invention has the further advantage that a strong, increasing, acceleration is imparted to the hammer, while the parts operating the
90 hammer preserve an almost uniform velocity. The difference in the action at the moment when the hammer receives the motion for the printing of the type is so great that the hammer has only to move a short distance,
95 the intermediate members being no longer subjected to the force applied to the key. The momentum is thereby generated almost entirely in the hammer and delivered to the type with but little loss. The momentum
100 generated in the intermediate members of other machines need not be taken into account, as it is lost in part through frictional resistances and cannot, on account of the play in the links, give the uniform action re-
105 quired. As the new device according to this invention works with the least possible loss of power, the members which transmit the motion can be light, so that only a light blow
110 on the key is required.

In the machines hitherto in use, the motion of the hammer takes place in a vertical plane, while in accordance with this invention, the hammer moves in a horizontal plane. This not only permits of a nonelastic connection between the key and the hammer, but it also effects saving of power, because a hammer moving upward requires more power to move it than a hammer moving in a horizontal plane.

A further advantage of the construction according to this invention is that the members transmitting motion to the hammer are utilized to operate a lever for the following purpose. The sheet of paper is kept by a spring a few millimeters away from the type-carrier so that the inspection of what has been written is possible to such an extent that even the last letter printed is always in view. When the hammer is operated, the said lever brings the sheet of paper slowly to within a short distance of the type-wheel, say half a millimeter. If this lever were not provided, the freely moving hammer would have to bring the paper into position, and this would not only consume a part of the momentum, but would also, on account of its suddenness, produce an objectionable crackling sound. These disadvantages are obviated by the present invention. Extra expenditure of power for moving the lever is scarcely needed as on account of the slowness of its motion, the frictional resistances are slight and the spring which retracts the paper from the type-carrier assists the rearward movement of the whole hammer mechanism so that the hammer retracting spring may be made correspondingly weaker.

The new hammer-operating device is represented in Figs. 1 to 3 of the accompanying drawings illustrating a machine in which the key-levers are parallel with the paper roll, although, if desired, the new operating device can be arranged in machines in which the type-levers lie from front to back of the machine at right angles to the paper roll.

The key-levers 1 carry the keys 2, and are mounted on two spindles 3, stirrups 4 being secured to arbors 5. To the left-hand arbor 5 are secured a stirrup 4 and lever 6, while a stirrup 4 and lever 8 are also secured to the right-hand arbor 5. The levers 6 and 8 are so connected by a rod 7 that both stirrups 4 move simultaneously, and if the stirrup 4 at the left-hand side be depressed by a type-key, the right-hand stirrup 4 is likewise depressed. The movement is transmitted by a link 9, jointed to the lever 8, to a U-shaped member consisting of an arbor 12 and upward arms 11 and 13. Depression of the stirrups 4 consequently results in a movement to the left of the arms 11 and 13.

Between the arm 13 and the hammer 19, 21, (which turns on the pin 20), is a link

connection consisting of a push rod 14, so that motion of the arm 13 to the left drives the hammer-head 21 against the type-carrier 10 and the paper between the type-wheel and the paper-roll 18 is brought into contact with the selected type of the type-carrier.

When the head 21 of the hammer 19, 21, is (on the key being depressed) in the vicinity of the type-cylinder 10, the ends of the hammer, the push-rod 14 and the pivot pin 20 of the hammer are nearly in the same line. By the change in the position of the push-rod 14, the hammer has a quick acceleration, and the momentum of the hammer is but little impeded if, shortly before the hammer reaches the type-carrier, the motion of the type-key ceases to act on one of the stirrups 4. This is necessary in order to obtain a neat impression, for before this can take place, the type-carrier must be brought to rest, this being secured by a previous arrest of the type-key operating the type-carrier. On the return of the type-key, the hammer mechanism is moved back by the spring 23 (Fig. 2) until the hammer head 21 meets with a stop 22, when the whole system is again in its initial position.

The U-shaped piece constituted by the arbor 12 and arms 11 and 13 serves not only to transmit the motion of the keys to the hammer, but also causes, at the same time, movement of a lever 16 pressing the paper toward the type-carrier. This is effected by means of a rod 15, which is also connected by the arm 13 of the aforesaid U-shaped member (11—12—13). This rod 15 is pivoted near to the pivot of the arm 13 so that the movement of the lever 16 is, in consequence, very small and slow.

In order to obtain good printing, it is not only necessary to consider the movement of the hammer, but also the corresponding movement of the type-carrier, the action of which should be certain. According to the type struck, this carrier or the member transmitting the movement has to partially rotate to the right, or left, (up to 90°). In the example shown in the drawings, this motion is produced by two toothed sectors 36, 36^a, pivoted on the spindles 5 and co-acting with the toothed wheels 35, 35^a, mounted on the spindle 40 by which the type-carrier 10 is driven. In arrangements of this kind it is as a rule necessary that the engagement of one of the sectors should not take place when the other sector comes into operation and that each of the sectors finds the driving wheel corresponding to it in the proper position ready for gearing. Moreover, the body to be set into rotation should have a small mass and be brought to rest without causing objectionable noise. Great simplicity of the whole construction is, in common with all arrangements used in con-

nection with type-writing machines, an object to be attained, and the arrangement shown in Figs. 1, 7 and 8 will secure this object.

5 The forward part of each sector has a toothed portion 44, 44^a, a small recessed portion and hook-shaped projections 45, 45^a. To the spindle 40 are secured, as hereinbefore stated, two wheels 35 and 35^a, co-acting
10 with the toothed segments 36, 36^a. Each of these wheels is provided with a toothed portion 41, 41^a, a plain portion 42, 42^a, and a deep recessed smooth portion 43, 43^a. These parts co-act with the corresponding parts 44,
15 45, or 44^a, 45^a, of the respective sectors. The toothed portion of the wheels gears with the toothed portion of the sectors, while the plain portion prevents the engagement of one sector when the other is operated. The
20 more deeply recessed part allows play for the hook-shaped projection of the sector which is at rest so that the driving wheel which is not in gear follows the motion of the other, the driving wheels having no motion relatively to each other. The side face
25 of the part unprovided with teeth limits the backward motion of the driving wheel, the hook-shaped projection of the toothed sector which is at rest acting as a stop. If both
30 toothed sectors be at rest, the hooked projections lie against the corresponding side faces of the part not provided with teeth, the driving wheels being thereby held in their mid position. The return motion of the driving
35 wheels is effected by the toothed sectors. It is in this arrangement of importance that the last tooth of the backward moving toothed sector comes out of the corresponding tooth space in the driving wheel to such extent
40 that the said tooth is clear of the path of the teeth of the driving wheel. It will be sufficient as a rule for the toothed sector to initiate the return motion of the toothed wheel. The momentum of the driving wheel and
45 the heavier parts secured to it is sufficient to accomplish the remaining part of the movement, which is small but sufficient for accurate working. In cases however in which the backward movement takes place but
50 slowly, namely, when the forward movement requires but a very small rotation, the frictional resistance may be large enough to absorb the momentum. In this case, the driving wheels must be returned to the mid
55 position by a special device. In the arrangement shown this is obtained by so forming the working edge of the hook-shaped projection that the points of the hook exert a leverage on the wheel, which is assisted by
60 a slight rounding of the hook points and of the side edge of the plain part of the driving wheel.

The movement of the spindle 40 is, by means of bevel wheels 32, 33, transmitted to
65 the arbor 34 and type-carrier 10. In order

that the motion of the type-carrier shall be not greater than is required for the type struck, a cylinder 29 is provided which carries stops 30 and 31, the depth of which corresponds with the position of the type on
70 the type-carrier. When either of the keys is struck, one of the said stops 30, 31, comes into the path of the corresponding key-lever and limits its motion at the moment when the type to be printed reaches the printing
75 position.

On a key being struck, in machines of a type bar pattern, or in those having a type-carrier of the above described kind, several devices are set in motion at the same time.
80 In the arrangement in accordance with this invention, these devices are the type-adjusting device, the type-printing device, and the device for the escapement of the paper-carriage (the latter is not shown in the draw-
85 ings). In the cooperation of these devices, a certain sequence, or time interval, for setting the parts in motion is necessary. Parts not accurately arranged, or worn out by friction, must be re-adjusted after they have been
90 some time at work. Hitherto this re-adjustment has been effected by filing in the case of metal parts, which is troublesome, any required addition of material being still more troublesome. On the score of sim-
95 plicity it is preferable to arrange a regulating device on the separate key levers, but usually the material, or the shape of the key-levers, prevents this, especially if adjusting screws are to be employed. Furthermore,
100 both on the score of simplicity and rapid manipulation, it is absolutely necessary to make the device easily accessible by means of screw-drivers, spanners, and the like. The essential part of the said device consists,
105 as shown in Figs. 2, 4, 5 and 6 of a U-shaped member 25 embracing each of the key-levers, the said U-shaped member being pivoted at 39 to the lever 1. The adjustment of the U-shaped member 25 on its pivot is such, or
110 it is clamped to the key-lever so, that the U-shaped member cannot fall down. This can be secured either by the natural tension of a riveted pivot, or by a suitable spring being given to the sides 37. (Fig. 5). To
115 obtain this springing action, the part 38 that connects the two sides 37 is somewhat cut away for about half the length of the member, the part 38 which is left forming, or carrying, the stop for a bar 24 (Fig. 2)
120 extending under the key levers, or any other member transmitting the motion of the keys. A screw 26 serves to adjust the member at various distances from the lower face of the key-lever. For the reception of the screw
125 26, the member 25 is provided with a projection, or thickening, 27. A jam-nut 28 serves to secure the screw in position. If the key-levers be of metal, the end of the
130 screw can come directly into contact with

the lower face of the lever, but if the levers be made of wood, a resisting striking plate for the end of the screw may be formed by means of a U-shaped bent plate with a tongue-shaped extension web passing over the wooden lever.

It will be evident that the details of the apparatus may be modified in many ways without departing from the spirit of this invention.

What I claim, and desire to secure by Letters Patent of the United States, is:

1. A typewriter comprising a movable type carrier, a hammer having oscillating movement in a horizontal plane, key mechanism, a rocking bar 12 located transversely of the machine at one end thereof, uprights on said bar, a link connecting one of said uprights with the hammer, a second link connected with the other upright, and means for connecting said second link with the key mechanism whereby the movement of the keys will rock the bar 12 and oscillate the hammer, substantially as described.

2. A typewriter comprising a movable type carrier, a hammer oscillating in a horizontal plane, a lever independent of the hammer for pressing the paper toward the type carrier, key mechanism, and a system of links and bars for transmitting the movement of the key mechanism to the hammer and lever, substantially as described.

3. In type-writing machines with movable type carrier hammer mechanism and key mechanism, the combination of the type carrier, with two sectors having hook shaped projections two driving wheels operating the

type carrier the said driving wheels having a toothed portion, a raised smooth portion and a recessed portion, essentially as and for the purpose stated.

4. In a typewriting machine with movable type-carrier, hammer mechanism and key mechanism, the combination of a key lever, a U-shaped member, pivotally attached to said key-lever, the side pieces of said member being adapted to clamp the same on the key-lever, a projection on the member and a screw in said projection for adjusting the member at various distances from the lower face of the key-lever, essentially as and for the purpose stated.

5. A typewriter comprising a movable type carrier, a hammer having oscillating movement in a horizontal plane, a lever independent of the hammer for pressing the paper toward the type carrier, key mechanism, a rocking bar 12 located transversely of the machine at one end thereof, uprights on said bar, a link connecting one of said uprights with the hammer, a link connecting the same upright with the lever, a third link connected with the other upright, and means for connecting said third link with the key mechanism, whereby the movement of the keys will rock the bar 12 and oscillate the hammer and lever.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDUARD THÜREY.

Witnesses:

LOUIS VANDORN,
M. KNEPPERS.