N° 21,024 A.D. 1908

Date of Application, 6th Oct., 1908

Complete Specification Left, 6th Apr., 1909—Accepted, 30th Sept., 1909

PROVISIONAL SPECIFICATION.

"Improvements relating to Time Recorders for Workmen and the like."

We, THE STOCKALL-BROOK TIME RECORDERS, LIMITED, of 11, Market Street, Huddersfield, in the County of York, Makers of Time Recorders, JAMES JOHN STOCKALL, Junior, of the same place, Engineer, and FRANK BROOK, also of the same place, Clock Maker, do hereby declare the nature of this invention to be as follows:—

This invention relates to time recorders in which the times of entry or departure are printed on respective cards inserted by the employees into a movable holder whose position is varied laterally and also vertically to bring the proper divisions and spaces on to the printing line, and our improvements comprise the provision of simple and effective means for shifting an ink ribbon, having two or more coloured portions, at predetermined times in order that the impressions made on the cards presented to the machine by late comers shall be in a different or contrasting colour to the impressions made on the cards of those arriving early or punctually while other impressions having a different signification may be printed in a further contrasting colour or colours.

In carrying out our invention in its preferred embodiment, we employ a ribbon holder or holders or guides for supporting the ink ribbon at each side of the card holder or sheath and adapted to move vertically or in the arc of a circle, the movement of said guide or guides to one position from normal position to present a different coloured section of ribbon being determined by the presentation of a recess or opening in the periphery of a disc or plate, fast on the hour wheel shaft, to a movable spindle or pivoted member, the entrance of the extremity of said spindle or pivoted member into the presented recess causing, through suitable actuating mechanism, the vertical movement of the guides to shift the ribbon to remove one coloured portion away from and the other into the printing line, the re-engagement of the spindle or nose of the arm or pivoted member with the periphery of the disc holding the parts in their normal positions with the first coloured portion of the ribbon on the printing line.

In employing a slidable spindle, we mount same in suitable bearings and apply a spring or springs thereto in any suitable manner to force the spindle in a direction towards the hour wheel shaft. The outer end of the spindle has a head or enlargement thereon which normally abuts against a flat or dwell on a disc or cam or tappet fast on a shaft carrying a spur wheel which gears with a toothed surface formed on or secured to a shaft extending across the machine at the front of the card sheath or holder, the said shaft being either fluted or toothed over approximately its full length or having toothed sections or pinions thereon which are adapted to mesh with racks forming part of the ribbon guides.

The ribbon is preferably held in the guides by light leaf springs which exert sufficient tension to ensure the vertical movement of the ribbon with said guides and hold the same taut between the guides but admit of the ribbon travelling endwise from one spool to the other without obstruction.

On the spur wheel we secure a stud which is embraced by a yoke or fork or by an elongated slot in the end of an arm rising up from and suitably connected

[*Price 8d.*]

to the hand lever by which the employee actuates the printing mechanism after insertion of his card in the card holder or sheath. To a stud or pin on said spur wheel is also connected one end of a spring whose opposite end is secured to a fixed point.

So long as the plain peripheral surface of the disc on the hour wheel shaft is presented to the slidable spindle said spindle is held stationary and the abutment of the head thereof against the flat or dwell portion on the disc or cam fast on the spur wheel shaft prevents any movement of said spur wheel and therefore of the pinion and guides which thus maintain one section of the ribbon in the printing line. Immediately, however, a recess in the disc on the hour wheel shaft is presented opposite the spindle, the latter is freed and forced endwise by the spring and the head moved clear of the disc on the spur wheel shaft thereby releasing the said spur wheel which under the action of the spring attached thereto is caused to make a partial rotation and through the pinions or toothed shaft and racks move the ribbon guides vertically to bring the contrasting coloured section of the ribbon opposite the printing line.

By forming recesses of different depths in the disc on the hour wheel shaft, the spindle is slid in its bearings to different extents and by an additional flat or flats, the extent of rotation of the spur wheel can be varied to move the ribbon guides to different heights.

The upward movement of the hand lever, after the shifting of the ribbon as described, causes the lower end of the yoke or slot in the arm connected with said hand lever to engage with the stud on the spur wheel and through the said wheel and pinions move the ribbon guides vertically to change the position of the ribbon, but so long as the spindle is within the recess in the disc on the hour wheel, the contrasting coloured section will be presented on the printing line at each printing action.

The disc on the hour wheel may have any number of recesses to bring about changes at predetermined times. Instead of recesses, enlargements or projections could be employed in which case the mechanism would be re-arranged or modified to suit the difference in movement caused thereby.

The motion to determine the vertical position of the ribbon may be transmitted direct to the shaft having the toothed sections or pinions thereon and the spur wheel omitted, if desired. If a pivotted arm having a nose or feeler thereon to enter the recesses in the disc on the hour wheel is employed in lieu of a slidable member, the motion of said arm would in the simplest form of our improvements be direct on the said shaft carrying the pinions or toothed sections, the extent of motion governed by the depth of any recess presented bringing the second or third or other coloured section of ribbon on to the printing line, the first or normal coloured section being always presented when the nose of the lever is engaged with the periphery of the disc.

Instead of the ribbon guides being moved by racks and pinions, the said guides could be formed on the ends of pivotted arms adapted through suitable connections to be rocked by the presentation of a recess in the disc on the hour wheel shaft to the sliding or pivotted feeler device.

An important feature of our invention consists in adapting the mechanism so as to print in any desired contrasting colours at the same time but in different divisions of the cards, as for instance, if the mechanism has been actuated to present, say, the red portion of the ribbon on the printing line in order that the cards of all late arrivals shall have the times printed in red as distinguished from say, blue, representing punctual arrivals, and it is necessary at the same time to record the times of departure of other workpeople leaving at the expiration of a given period, which records must be printed in say, blue, as denoting that the employees concerned left on or after the expiration of the specified period, by a lateral movement of the usual hand lever to bring an "out" division on the time card opposite the printing hammer such lateral movement will bring the pivotted or sliding feeler device opposite a different section of the disc or

a separate disc which if no recess is presented, as will be the case, it being understood that the recesses are provided for making a change of the ribbon to mark late arrivals or too early departures, the engagement of the feeler with the periphery of the said disc or section of disc will shift the ribbon back to normal position for the printing action and immediately the hand lever is moved back to the "in" column, the feeler device will drop back into the recess presented by the disc or section of disc it was previously in register with and thus re-instate the red portion of the ribbon in position to print the time of the late arrivals in the "in" column in red.

In this case the shaft carrying the pinions meshing with the racks is movable endwise with the card sheath, or it may be the feeler device itself if this actuates the said shaft through intermediate mechanism.

Instead of a single disc on the hour wheel shaft, we provide two or more discs, preferably four discs, or a drum or disc of a width equal thereto, each disc or section of disc having recesses therein to bring about changes in the position of the ink ribbon at predetermined times. The movement of the shaft or feeler device laterally with the lateral movement of the card sheath brings a feeler arm on said shaft or the feeler device opposite a separate disc or section of disc and if there is no recess presented by same, the ribbon is moved back to its original position and at the printing action the time is printed in the column presented in the same colour as say, as the time of those arriving early, but if the employees depart before a given time, then a recess presented by the respective disc will cause the time of departure to be printed in the same colour as is the time of those arriving late. The number of discs or recessed sections of a disc or barrel will correspond to the number of columns into which the time card is divided and the times printed in each column at any period of the day will vary in colour according to whether the register is made before or after the expiration of predetermined periods.

Instead of actuating ribbon guides located at each side of the card sheath, the spools themselves with the ribbon extending between them may be moved bodily in a vertical path, the feeler device or mechanism in this case operating through connections the bobbin or spool spindles which extend through hollow sleeves, the sleeves being driven by bevel gears and the motion for unwinding and winding on the ribbon transmitted to the bobbin spindle by pin and slot connections, the ribbon being kept taut by tension springs.

It will be understood that the details of our improvements and the arrangement of the parts may be varied somewhat without departing from our invention.

Dated this 5th day of October, 1908.

BARRON & LEWIN,
32, John William Street, Huddersfield,
Agents for the Applicants.

COMPLETE SPECIFICATION.

"Improvements relating to Time Recorders for Workmen and the like."

We, THE STOCKALL-BROOK TIME RECORDERS, LIMITED, of 11, Market Street, Huddersfield, in the County of York, Makers of Time Recorders, JAMES JOHN STOCKALL, Junior, of the same place, Engineer, and FRANK BROOK, also of the same place, Clock Maker, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to time recorders in which the times of entry or departure are printed on respective cards inserted by the employees into a

movable holder whose position is varied laterally and also vertically to bring the proper divisions and spaces on to the printing line, and our improvements comprise the provision of simple and effective means for shifting an ink ribbon, having two or more coloured portions, at predetermined times in order that the impressions made on the cards presented to the machine by late comers shall be in a different or contrasting colour to the impressions made on the cards of those arriving early or punctually while other impressions having a different signification may be printed in a further contrasting colour or colours.

In order that the nature of our invention may be clearly understood we shall, in describing same, refer to the accompanying drawings illustrative thereof in which:—

Fig. 1 is a side elevation of a time recorder of the type referred to, and having applied thereto one embodiment of our invention. Parts not necessary for the description are omitted;

Fig. 2 is a detached side elevation of the ribbon shifting device shown in Fig. 1, the parts being shown in the position they occupy when the ribbon has been shifted to present a different colour to the printing line;

Fig. 3 is a similar view to Fig. 2 but shows the action of the feeler device to prevent shifting of the ribbon when no such movement is called for;

Fig. 4 is a detail hereafter referred to;

Fig. 5 is an elevation of Fig. 1, looking in the direction of the arrow A, said figure;

Fig. 6 is a detached elevation of a bobbin or spool spindle having means applied thereto for raising the bobbin or spool vertically to effect a change in the colour of ribbon presented at the printing point, and

Fig. 7 is a front view of Fig. 6, and is partly sectioned to give a clearer view of the construction.

Referring to the drawings, 1 represents the back plate, and 2, 2 the side plates or frames by which the mechanism is carried; 3 represents the type wheel or wheels; 4, 4, the bobbins or spools on which the ink ribbon is carried; 5, 5, the spindles for supporting and actuating the ribbon spools; 6 the card sheath or holder into which the card on which the record is to be printed is inserted; and 7, 7, the rods on which the card sheath or holder is supported and is slidable to present the desired portion of the card opposite the printing line. The above parts are or may be all of known construction and form no part of our present invention.

In carrying out our invention, we employ in the embodiment shown in Figs. 1 to 4, ribbon holders or guides 8, 8, for supporting or engaging the ribbon at each side of the card holder or sheath.

The ribbon is held in the guides 8, 8, by means of light leaf springs 9, 9, which exert sufficient tension to ensure the vertical movement of the ribbon with said guides and hold it taut between them, but yet to admit of the ribbon travelling endwise from one spool to the other without obstruction.

The guides 8, 8, are slotted as at 8^1, 8^1, to permit of vertical movement thereof, headed studs 10, 10 projecting from the sides of the card sheath maintaining the guides in lateral position.

In the embodiment shown, the ribbon is provided with two differently coloured portions indicated at 11, 11^1 and the arrangement is such that downward vertical movement of the ribbon holders 8, 8, moves the ribbon from the normal position in which the portion 11 (say blue) is opposite the printing line, to a position in which the differently coloured portion 11^1 (say red) is presented opposite the printing line. This will be understood by reference to Figs. 2 and 3 where the arrow B may be taken as representing the printing line. In Fig. 3 no movement of the ribbon has taken place and the blue portion 11 of the ribbon is presented, whilst in Fig. 2, where the feeler device has called for a change of colour the red portion 11^1 of the ribbon is presented.

The movement of the ribbon guides or holders to effect this shifting of the

ribbon is determined by a series of discs or plates 12 provided at intervals with projections 12^1. The discs 12 are rotatably mounted on a stud 13 and attached to the said discs so as to rotate therewith is a spur wheel 14 meshing with a pinion 15 fast on the shaft of the type wheel or wheels 3.

Co-operating with the discs 12 is a spring controlled spindle or feeler 16 slidable in openings in a bracket 17 attached to one of the side frames 2. Bearing against the head 16^{11} of the feeler spindle 16 is a cam or tappet 18 fast on the end of a shaft 19 extending across the front of the machine. This shaft 19 is provided with fluted or toothed portions 19^1, 19^1, which are adapted to mesh with rack teeth 8^2, 8^2, formed on the front of the ribbon guides or holders 8, 8.

Meshing with the toothed shaft 19 is a spur wheel 20 mounted on a stud 21 on which is also mounted, loosely, a plate 22 carrying at its outer end a pin or screw 23 which registers in a slot 24^1 in the upper end of a vertical lever 24, whose lower end is connected to the hand lever 25 by means of which the employee operates the printing mechanism to record on his card the time of entry or departure.

The pin 23 in addition to registering in the slot 24^1 of the lever 24 also passes through a recess or gap 20^1 formed in the periphery of the spur wheel 20. A spring 26 connected at one end to the pin 23 and at the other end to the frame 2 acts to draw the said pin downwards and the lever 24 as it moves back to normal position *i.e.* that shown in Fig. 1, acts to raise it.

The action of the parts is as follows:—The discs 12 are rotated synchronously with the type wheel or wheels and they are provided on their peripheries with projections 12^1 the length of each of which corresponds to a predetermined time or movement or number of movements of the type wheel.

For convenience of illustration, we may suppose that one of the projections 12^1 corresponds to a time of half an hour. When the proper time arrives for the employees to record on their cards the time of entry or departure the front end of the projection will lie in the path of the feeler spindle 16. On an employee drawing down the operating handle 25 in the usual way to make his record, the slotted upper end of the lever 24 will leave the pin 23. The spring 26 will tend to draw the said pin downwards to the limit of the opening or recess 20^1 but owing to the abutment of the end of the feeler spindle with the projection 12^1 (as in Fig. 3) no rotative movement of the gear 20 or toothed shaft 19 can take place. The ribbon holders or guides 8, 8, therefore remain stationary and the record of the employee is made in the ordinary or normal colour.

If, however, an employee presents his card after the predetermined period of half an hour for entry has elapsed, the projection 12^1 will have been moved away by the rotation of the type wheels from the path of the feeler spindle. The feeler spindle is therefore free to move into the recess 12^2 of the disc 12, and on the operating handle 25 being now depressed the spring 26 draws down the pin 23 to the limit of the recess 20^1 in the gear 20 and then presses on the lower edge of the said recess and rotates the said gear.

The rotation of the gear 20 causes rotation of the shaft 19, the toothed portions 19^1, 19^1 of which are in mesh with the racks 8^2, 8^2, on the ribbon holders 8, 8, and the said ribbon holders are therefore drawn down, as shown at Fig. 2, to present the abnormal or red portion 11^1 of the ribbon opposite the printing line. The record or impression of the late employee is thus made in an abnormal or contrasting colour to the records or impressions of the employees who have arrived earlier or punctually thereby greatly facilitating the examination or tabulation of the records.

On release of the operating handle 25 the upward movement of the lever 24 causes the slotted upper end 24^1 of same to engage the pin 23 and raise it back to its normal position, which, as will be understood, causes the gear 20 to rotate the shaft 19 in a reverse direction and raise the ribbon guides to present the normally coloured portion of the ribbon opposite the printing line.

If more than two contrasting colours of ink are desired, depressions such as 12^3 (Fig. 1), or of greater depth, may be provided in the discs 12 to permit of an increased movement of the feeler spindle. In this case the cam 18 would be shaped or made sufficiently large to keep in abutment with the head of the feeler spindle when the latter made its greatest movement. It will be evident that the further the feeler spindle moved towards the centre of the disc, the greater would be the distance the ribbon guides would be moved.

Supposing that during a "late" period, or time during which actuation of the mechanism would cause the abnormally coloured portion of ribbon to be presented opposite the printing line, an employee wishes to make a record or impression of the time of his departure (or during a "late out" period of the time of his entry) this would probably be required to be printed in the ordinary colour. Ordinarily the cards on which the records or impressions are made are divided into four vertical divisions representing "in a.m."; "out a.m."; "in p.m."; and "out p.m."

We therefore provide four of the discs 12 (see Fig. 5) secured together and to the spur wheel 14, the whole being slidable endwise on the stud 13 to present any disc desired opposite the feeler spindle 16.

The lever 27, which through the link 28 causes the card holder or sheath to be moved laterally to bring the desired division of the card opposite the printing line, has pivoted to it one end of a bar or lever 29 whose other end is forked as at 29^1 and engages in an annular groove 12^4 formed in the boss 12^5 of the outermost disc 12. The movement of the lever 27 therefore to bring any desired vertical division of the card opposite the printing line will cause the discs to be slid endwise on their stud to bring the corresponding disc opposite to the feeler spindle.

The number of discs provided will of course vary with the number of columns with which the card employed is provided and the times printed in each column at any period of the day will vary in colour according to whether the registration is made before or after the expiration of predetermined periods. Instead of a series of discs, a single disc could be employed and if desired a series of feelers set at different angles provided to effect the shifting of the ribbon called for.

In place of a slidable feeler or spindle such as 16 to co-operate with the discs 12 we may employ a pivotted arm having a nose or feeler thereon to enter recesses in the disc to determine the shifting of the ribbon. The arm may be attached to the shaft 19 in which case the depth of the recess in the discs into which the nose of the arm entered would directly determine the rotation of the shaft 19 and consequently the extent of movement of the ribbon guides to bring the second or third or other coloured section of the ribbon opposite the printing line, the first or normal colour being always presented when the nose of the lever was engaged with the periphery of the disc.

In place of sliding the discs to present any particular one opposite the feeler device we may make the discs to occupy a fixed lateral position and cause the feeler device to slide. As a modification, the card sheath may carry a fork embracing a toothed pinion secured on the shaft 19 by key adapted to slide in a groove in said shaft 19 which in this instance would be a plain shaft, the toothed pinion serving in place of the toothed shaft and being movable along said shaft or the shaft could be moved endwise:

Instead of the ribbon guides being moved as shown and described by racks and a toothed shaft the said guides could be formed on the ends of pivoted arms adapted through suitable connections to be rocked by the presentation of a recess in a disc to the sliding or pivoted feeler device.

Instead of actuating ribbon guides located at each side of the card sheath to effect a change in the colour of the section of ribbon presented opposite the printing line, the spools themselves with the ribbon extending between them may be moved bodily in a vertical path, such an arrangement being shown at

Figs. 6 and 7. In this case the spool spindles 5, 5 pass through hollow sleeves 30, the sleeves being driven by the usual bevel gearing and transmitting their motion to the spindles to traverse the ribbon endwise by means of slots 31 in the sleeves, the sides of which said slots engage pins 32 projecting from the spindles.

The lower end of each of the spindles is engaged by the forked end of a lever 33 pivoted on a shaft 34, movement being given to the levers 33 to effect shifting of the ribbon by suitable connecting means from the feeler device or mechanism as will be understood by those who have followed the description of the arrangements previously set forth.

The details of construction of the parts may, as will be understood, be varied without departing from the invention.

It has previously been proposed to construct workmen's and like time recorders to print regular times in one colour and irregular times in a contrasting colour and to control the mechanism for shifting the ribbon by means of a disc driven synchronously with the type wheels and having recesses in its periphery into which a pivoted finger is adapted to enter, and we therefore do not claim such devices broadly but only the improved means herein shown and described for obtaining similar results, nor do we make any claim to the movement of the ribbon spools bodily in a vertical direction to present a contrasting coloured section of the ribbon on the printing line, as this has previously been proposed.

Having now particularly described nad ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In a time recorder of the type referred to, the combination of vertically movable ribbon guides engaging the ribbon at each side of the card sheath or holder the said ribbon guides being provided or formed with racks meshing with a transverse toothed shaft, a feeler device co-operating with a disc or a series of discs rotating synchronously with the type wheel or wheels, and the means co-operating with the feeler device and the toothed shaft to cause the latter, when determined by the feeler device, to move the ribbon guides vertically to present a contrastingly coloured section of the ribbon opposite the printing line, substantially as herein set forth.

2. In a time recorder of the type referred to provided with a ribbon shifting arrangement according to Claim 1, arranging the discs or the feeler device to be slidable endwise so that any disc desired may be presented opposite the feeler device or the latter presented opposite any desired disc, according to the lateral position of the card holder relatively to the printing line, substantially as and for the purpose herein set forth.

3. In a time recorder of the type herein referred to, the combination of a disc or series of discs rotating synchronously with the type wheel or wheels, a feeler device co-operating therewith as set forth, and the means co-operating with said feeler device for moving the driven spindles with the bobbins or spools fast thereon, bodily in a vertical direction to present a contrastingly coloured section of ribbon opposite the printing line, substantially as herein shown and set forth.

4. The general arrangement, construction and combination of parts constituting the improved means for shifting the ribbon in a time recorder to present, when desired, a differently coloured section of ribbon opposite the printing line, substantially as and for the purpose herein shown and described.

Dated this 5th day of April, 1909.

BARRON & LEWIN,
32, John William Street, Huddersfield,
Agents for the Applicants.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1909.

A.D. 1908. Oct. 6. N° 21,024.

THE STOCKALL—BROOK TIME RECORDERS [LTD.] & *others'* Complete Specification.

(3 SHEETS)
SHEET 1

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 3.

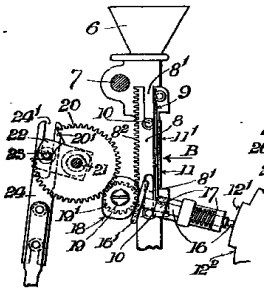

Fig. 2.

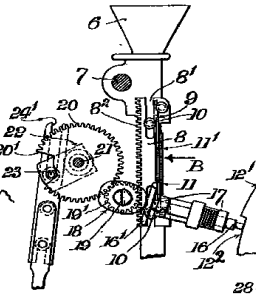

Fig. 1.

Fig. 4.

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Fig. 3.

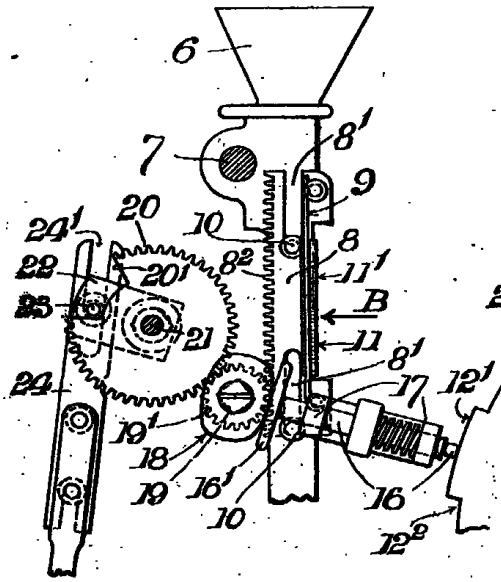

Fig. 2.

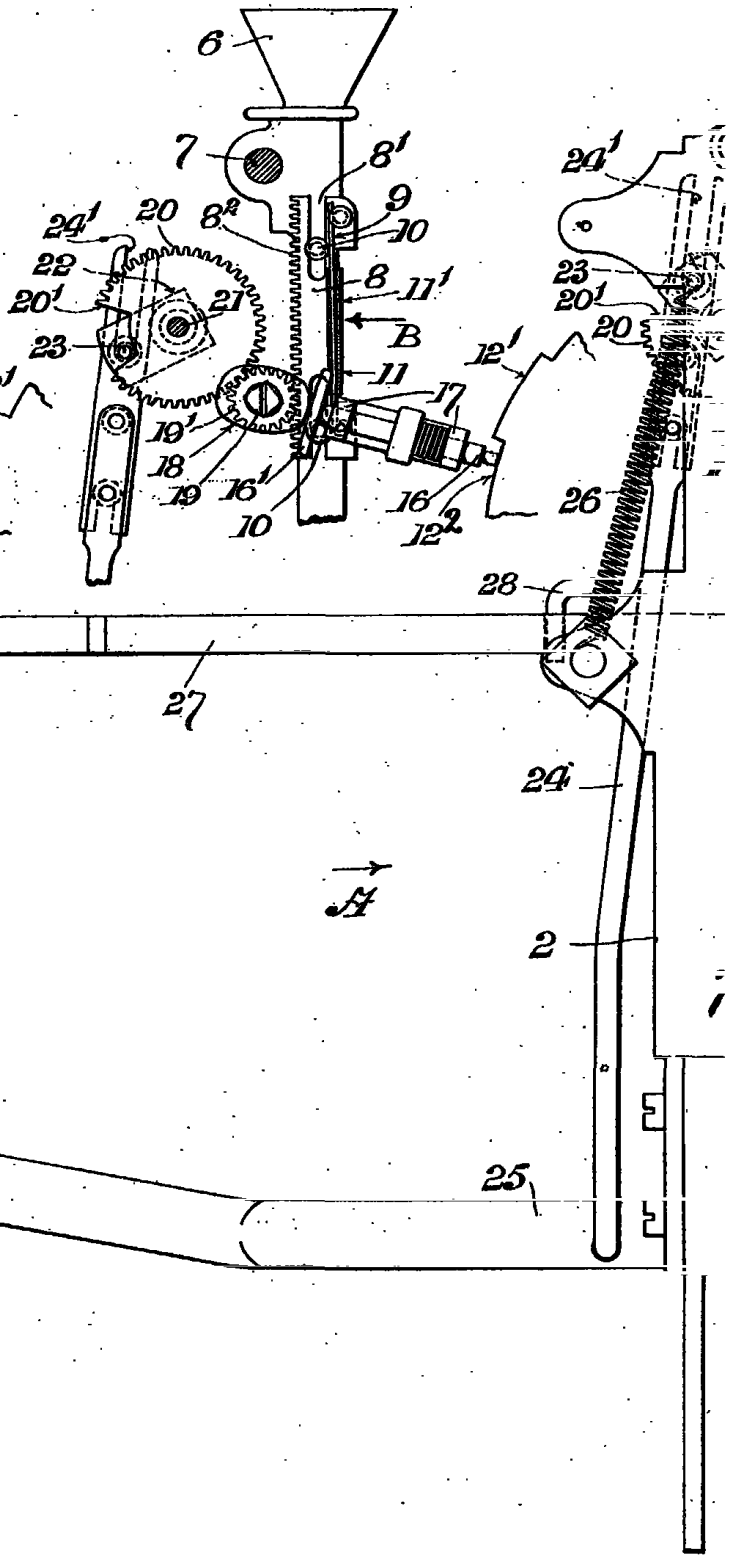

Fig. 4.

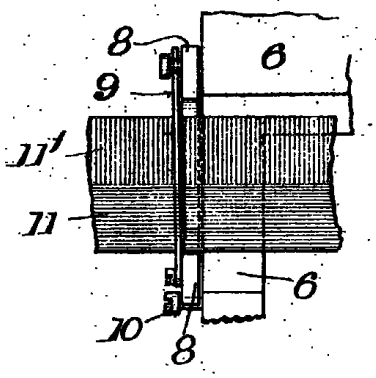

Fig. 1.

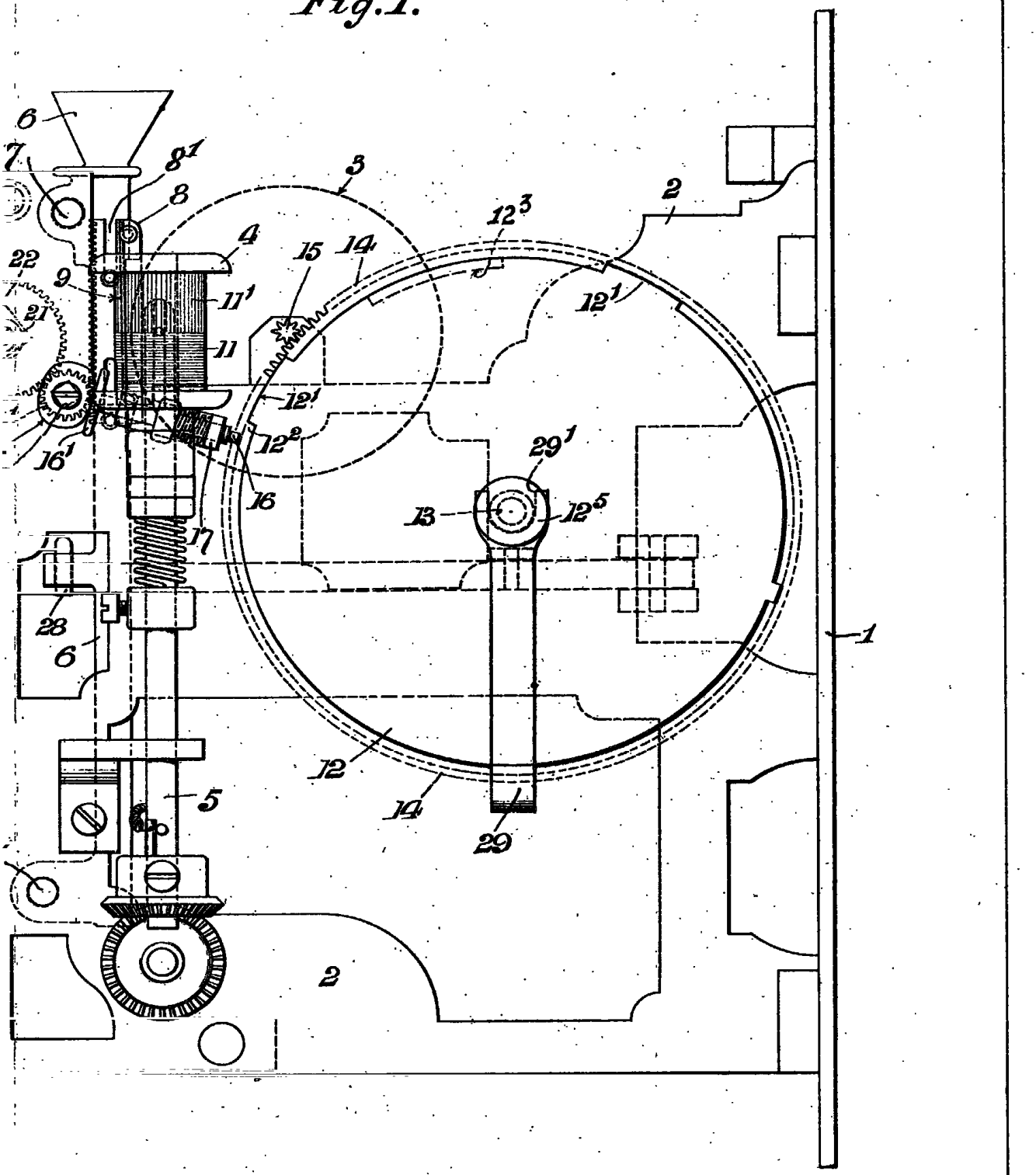

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Fig. 5.

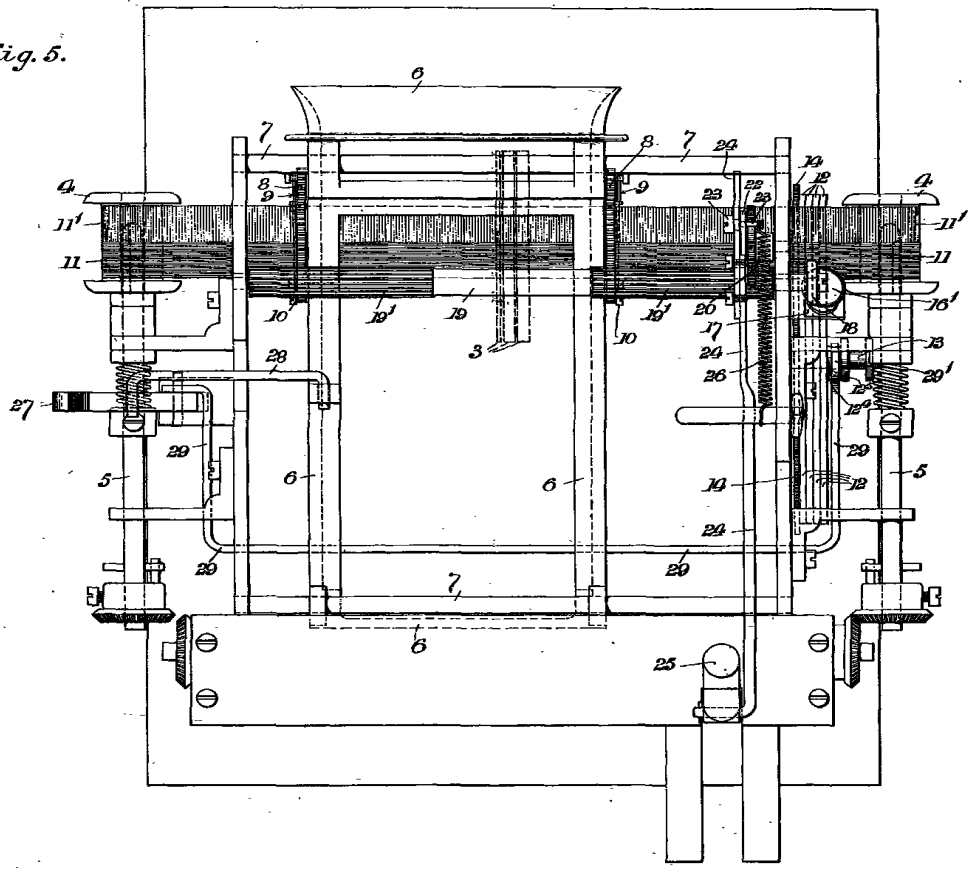
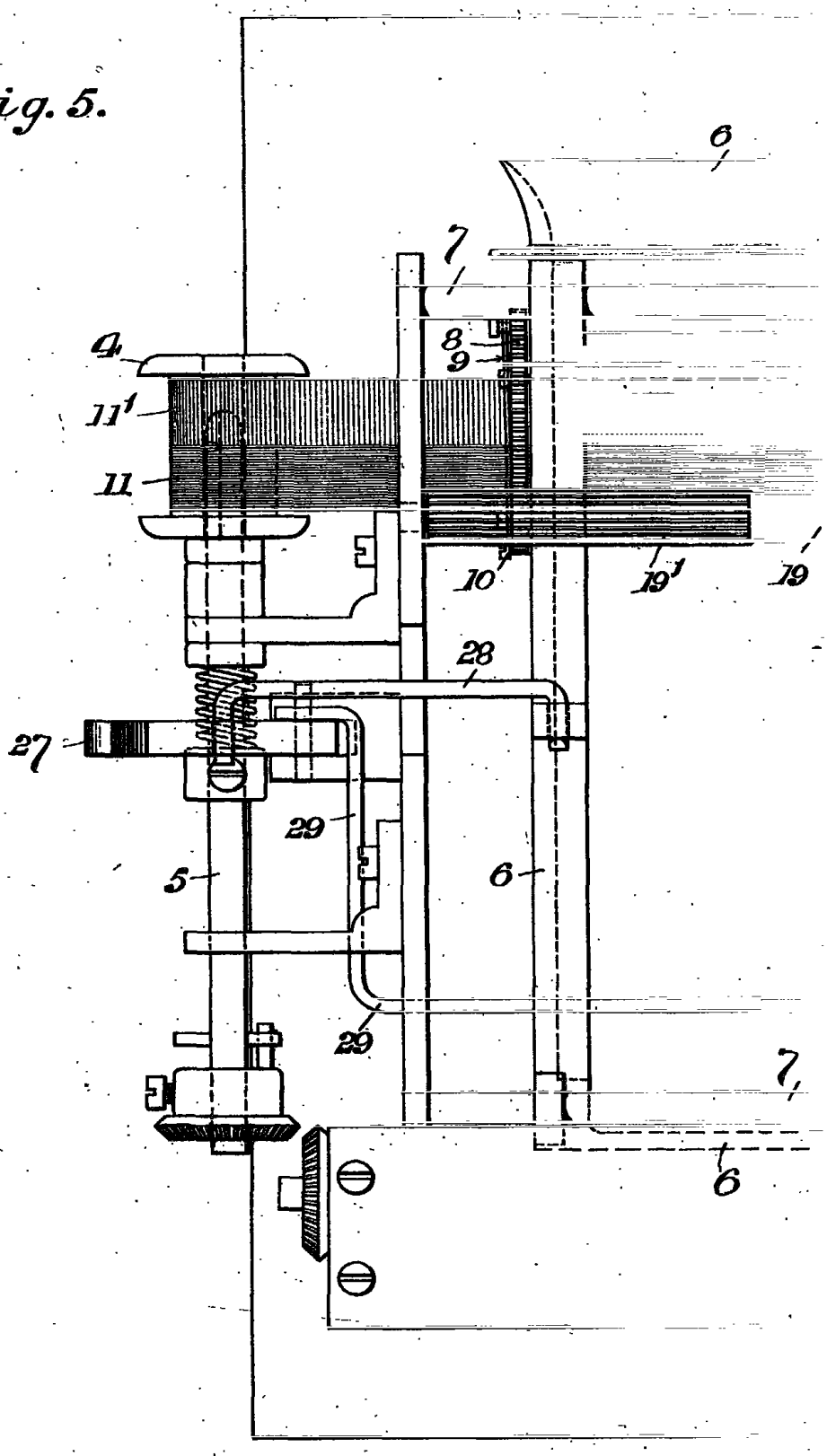


Fig. 5.



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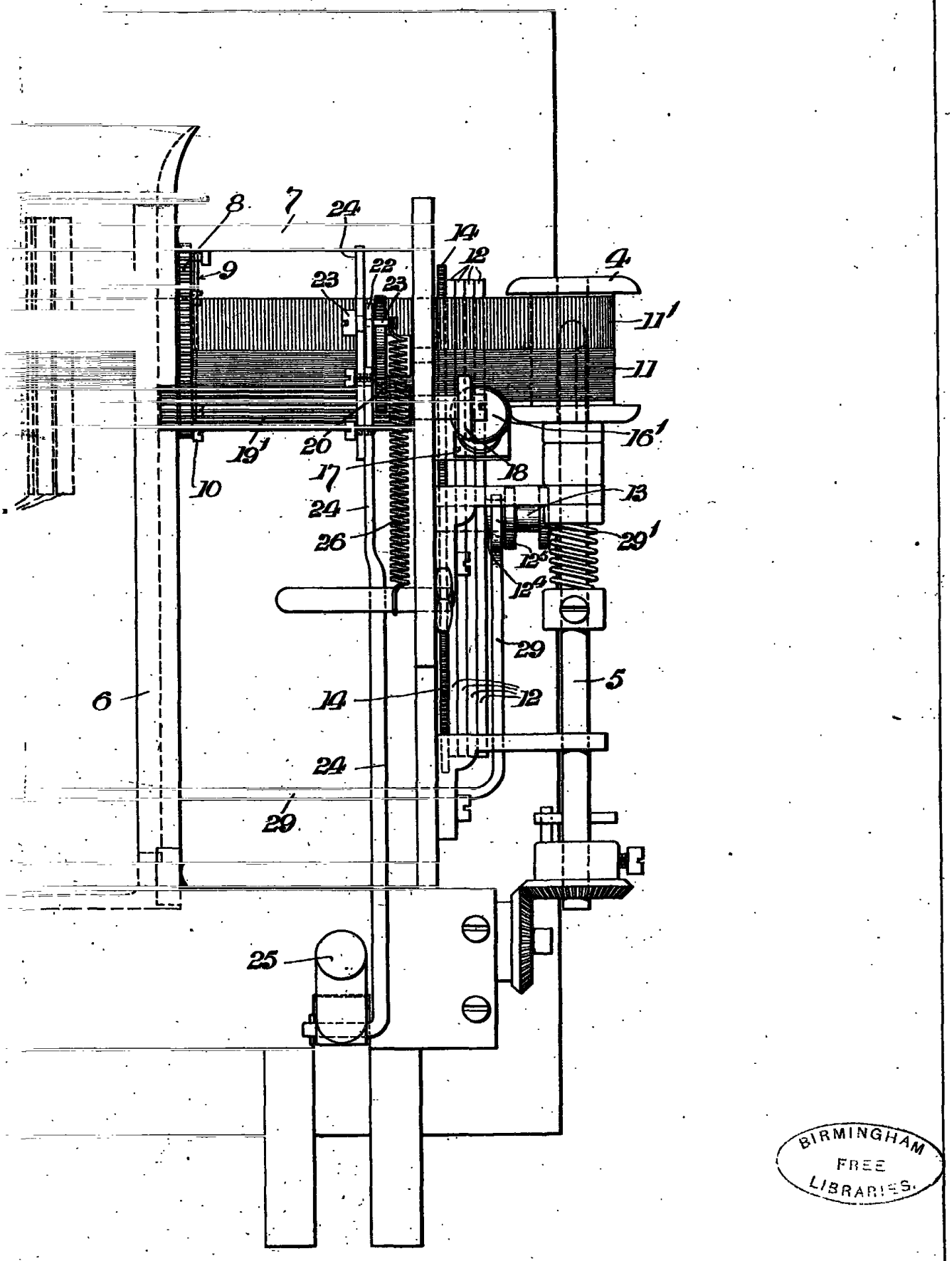

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Fig. 6.

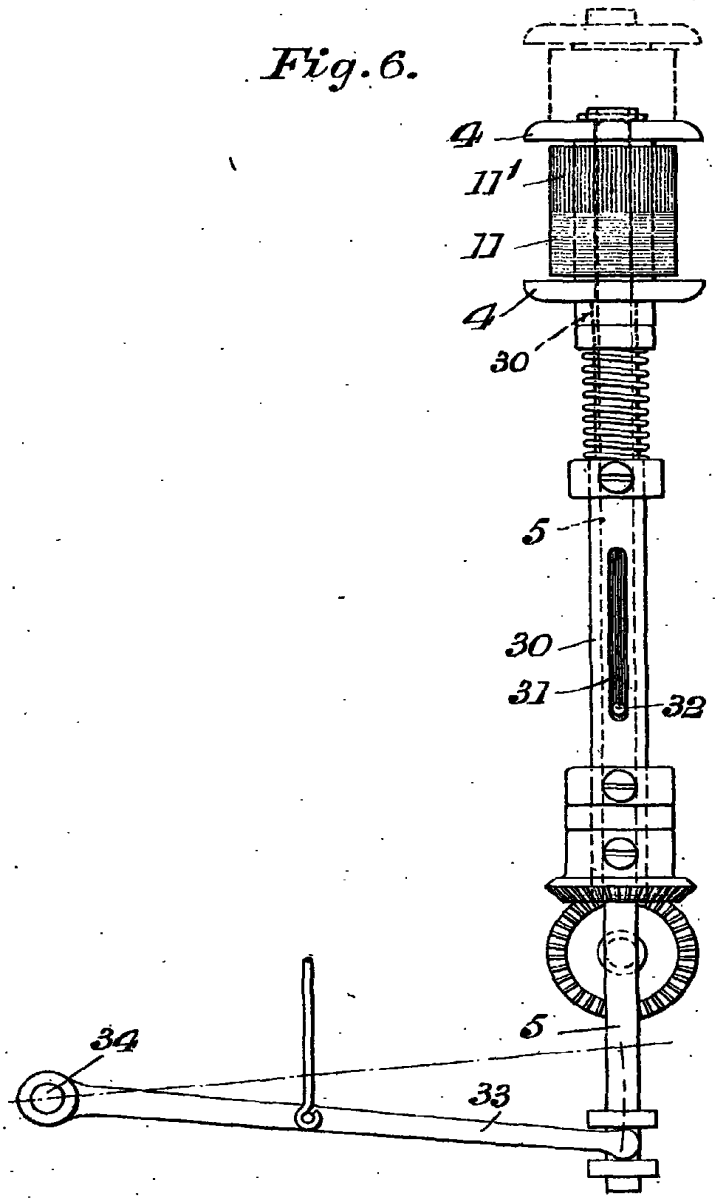
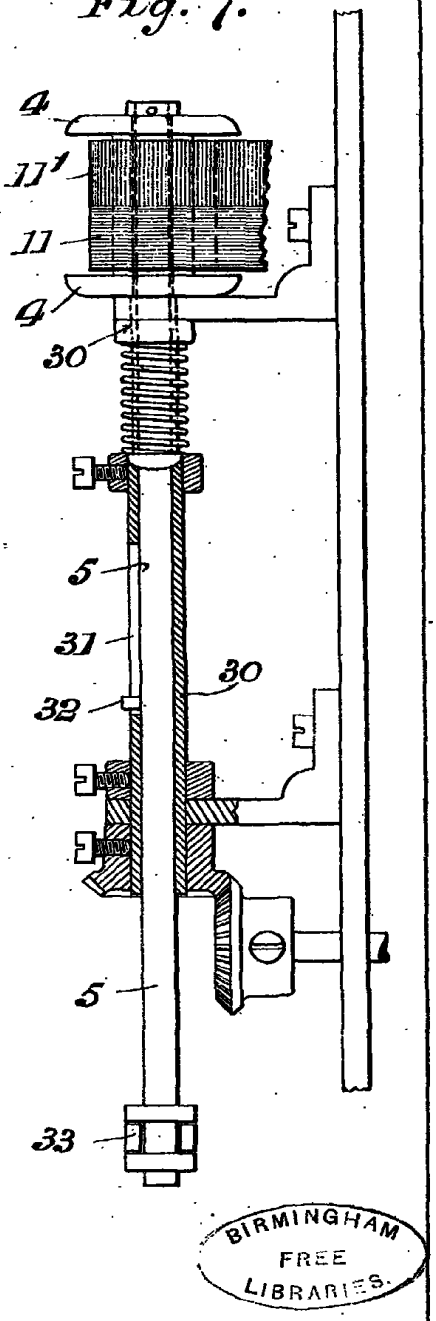


Fig. 7.



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