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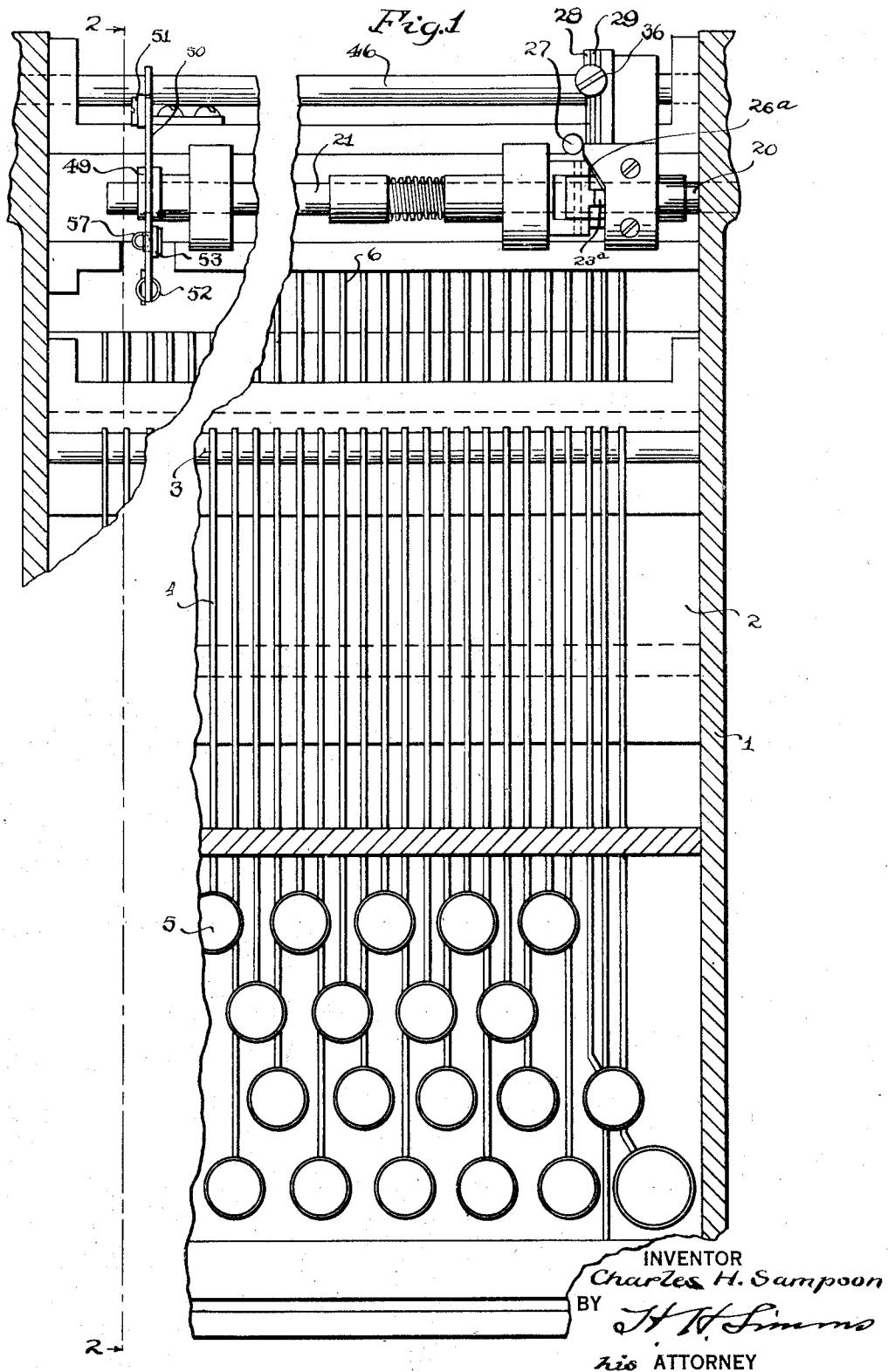
C. H. SAMPSON

1,819,975

KEYBOARD MECHANISM

Filed Feb. 18, 1929

3 Sheets-Sheet 1



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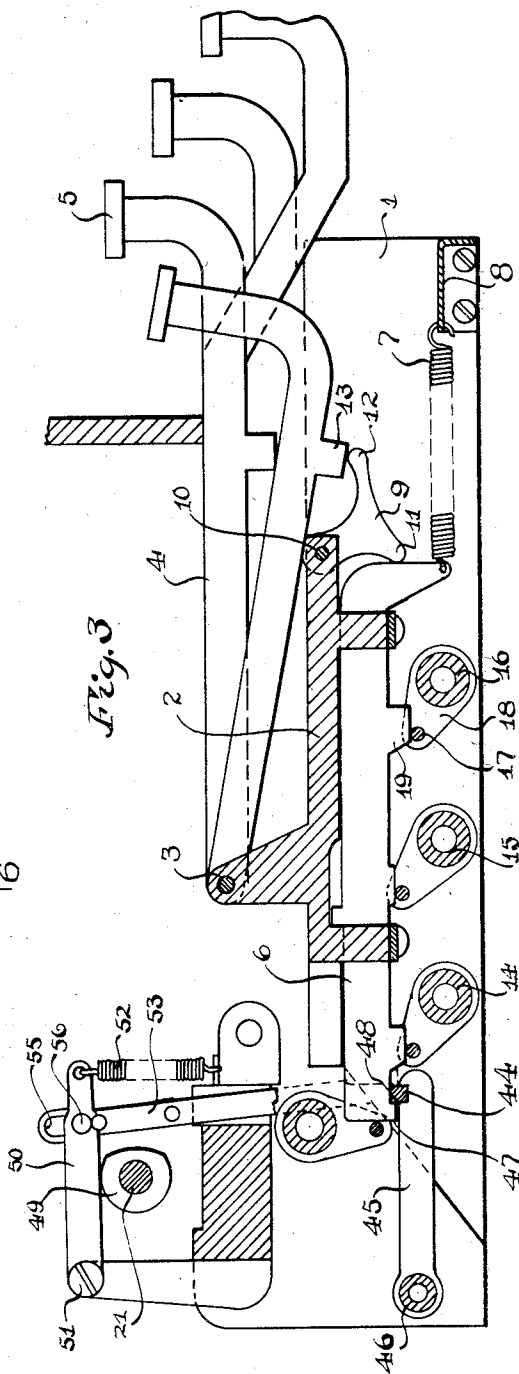
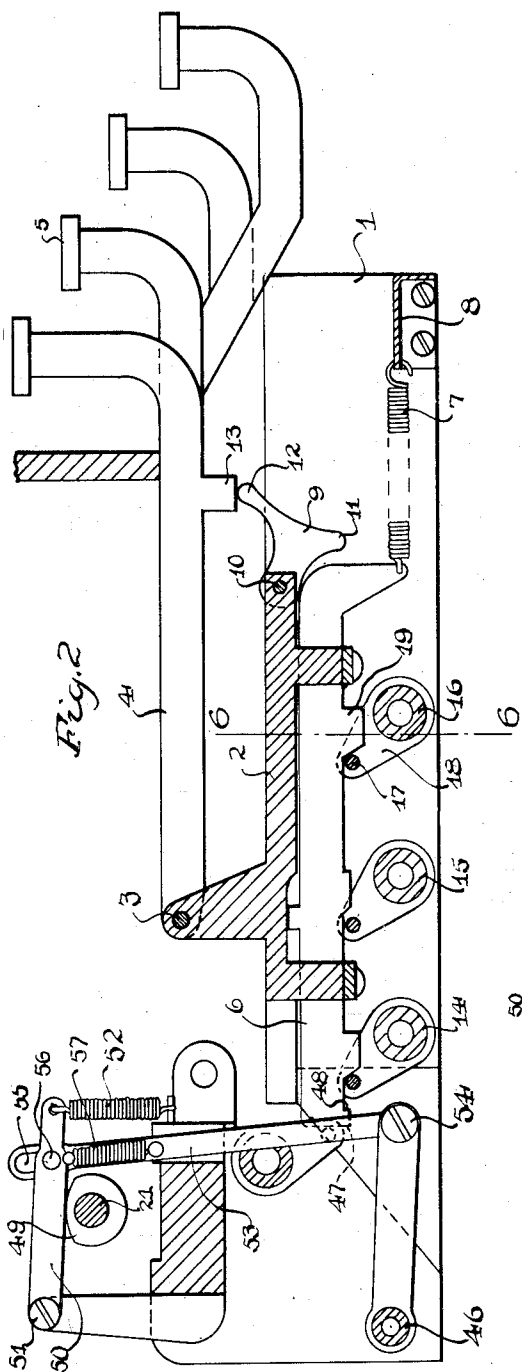
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KEYBOARD MECHANISM

Filed Feb. 18, 1929

3 Sheets-Sheet 2



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Aug. 18, 1931.

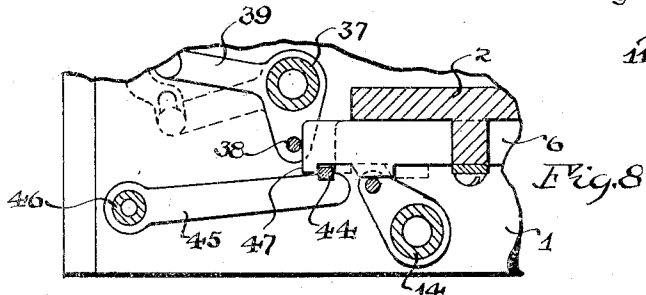
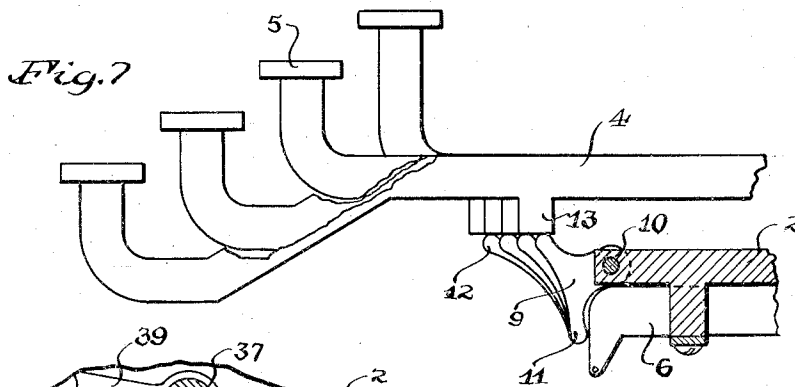
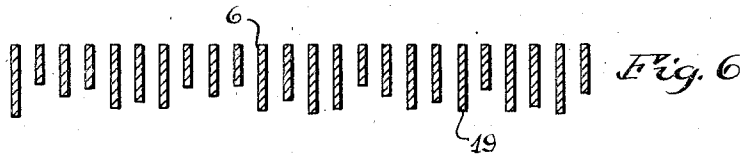
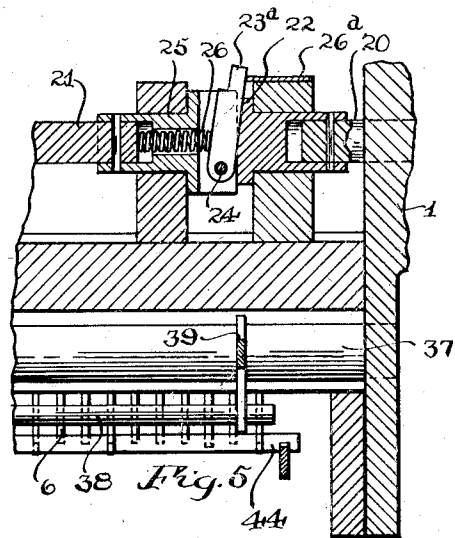
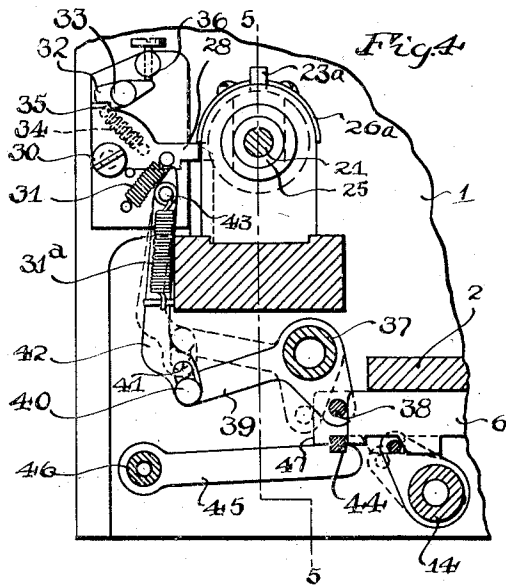
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KEYBOARD MECHANISM

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3 Sheets-Sheet 3



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KEYBOARD MECHANISM

Application filed February 18, 1929. Serial No. 340,846.

The present invention relates to keyboard mechanisms for typewriting and other machines where a key board is employed for setting, positioning or operating devices or mechanisms. An object of this invention is to provide a novel construction in which the key levers are of different lengths but have a uniform action on members acted upon by the key levers. Another object of the invention is to provide power operated means controlled by the key board in such a manner that the power is brought into action after a setting, positioning or operating action by key operated members. Still another object of the invention is to provide for controlling a clutch connection with a driving shaft through a plurality of key operated members. A further object of the invention is to provide locking means for key operated members to lock a shifted key in shifted position and/or to lock the non-shifted keys after the shifting of one key in normal position. A still further object of the invention is to provide a locking mechanism for a shifted and/or non-shifted keys controlled by a shifted key and operated by a power driven means.

To these and other ends, the invention consists of certain parts and combinations of parts, all of which will be hereinafter described: the novel features being pointed out in the appended claims.

In the drawings:

Fig. 1 is a fragmentary plan view of a key board mechanism embodying the present invention;

Fig. 2 is a fragmentary vertical section on the line 2—2, Fig. 1 showing the key levers in normal positions;

Fig. 3 is a similar view showing one of the key levers shifted;

Fig. 4 is a detail sectional view showing the clutch and its controlling means;

Fig. 5 is a fragmentary section on the line 5—5, Fig. 4;

Fig. 6 is a section on the line 6—6, Fig. 2;

Fig. 7 is a fragmentary view showing the equalizing levers between the key levers and the slides, and

Fig. 8 is a detail view showing the manner

in which the locking bar locks the non-shifted key operated slides or member.

The invention is herein shown as embodied in a keyboard mechanism for typewriting machines but it is apparent that it is capable of use in any machine where the functions of the mechanism may be utilized. A typewriting machine in which the keyboard mechanism has been embodied is illustrated in an application filed by me on January 18th, 1929, Serial No. 333,300.

In the illustrated embodiment of the invention, 1 indicates the sides of a supporting frame connected by a cross piece 2. Pivoted to the upper side of this cross piece 2 at 3 are the key levers 4 which have the keys 5 at their outer ends, the keys being arranged in four rows so that there are four sets of levers of different lengths. Arranged on the under side of the cross piece are movable members 6, in this instance, in the form of parallel slides which are normally held in forward positions by springs 7 each connected to one of the slides and also to a common anchoring bar 8 connecting the forward portions of the side frames 1.

Connection between each key lever 4 and one of the slides 6 is established, in this instance, by a device 9 which acts as an equalizing device, being, in this instance, pivoted at 10 to the cross bar 2 at the forward edge thereof and having two oppositely extending arms 11 and 12. The arms 11 on the entire set of equalizing levers 9 are the same length, whereas three of four sets of arms 12 are of different lengths corresponding to the different sets of key levers. The arms 11 abut the forward ends of the slides 6 whereas, the arms 12 abut projections 13 on the under sides of the key levers 4, the longest set of arms cooperating with the longest key levers and at points more remote from the pivots of such levers than such arms on the other sets of equalizing levers and so on whereby each slide is moved the same distance by its key lever notwithstanding the differences in lengths of the key levers.

In the present invention each key lever controls the movement of three movable members 14, 15 and 16, in this instance, in the

form of rock shafts arranged beneath the slides 6 and in turn setting, operating or positioning any suitable mechanisms. In my hereinbefore mentioned application on a typewriter they set or position stops which determine the printing position of a printing member. In order to be operated by the slides 6 each rock shaft may have a rod 17 supported therefrom in parallel and eccentric relation thereto by arms 18 and with these rods engage projections 19 on the slides 6. Each slide has three of such projections and the projections vary in length on the different slides so that the amount of movement imparted by each shaft to the rock shafts vary, the longer the projection, the greater amount of movement imparted to a rock shaft.

In addition to moving or positioning the rock shafts 14, 15 and 16, each slide 6 also controls connection between a driving shaft 20 and a driven shaft 21 which in my hereinbefore mentioned application effects the movement of a printing member to a position determined by the stops set by the rock shafts 14, 15 and 16. The connection in the present construction is a clutch set forth in an application filed by me on January 18th, 1929, Serial No. 333,300 embodying a clutch member 22 on the driving member having shoulders or abutments 23 for engagement by a movable part 23^a pivoted at 24 to the driven member 25 of the clutch. A spring 26 acts on the movable part 23^a to hold the latter yieldingly toward the abutments 22 so that the two members of the clutch will turn together. A shifter in the form of a stationary or fixed cam 26^a acts on the projecting end of the part 23^a to move the latter out of engagement with the abutments 23 so as to break connection between the driving and the driven shaft. After the part 23^a passes off the end of the shifting cam 26^a it comes to rest against a stop or abutment 27 which is spaced from the end of the cam. Opposite this space is arranged a detaining means which holds the part 23 on the abutment against shifting under the action of the spring 26. This detaining means comprises two detents 28 and 29 copivoted at 30. The detent 28 has a spring 31 normally urging such detent to detaining position. The detent 29 has a spring 31^a normally urging it to detaining position. Mounted on the detent 29 is a pawl 32 which is pivoted at 33 to the detent 29 and is urged by a spring 34 toward a shoulder 35 on the detent 28. When the detent 29 is moved as hereinafter described, the pawl 32 engages the shoulder 35 and shifts the detent until such a time that the pawl 32 engages an adjustable shifter 36 when the pawl is kicked out of engagement with the shoulder 35 and the detent 28 returns to detaining position before the detent 29 is released so as to be in position to prevent the

movable part 23 moving under the action of the spring 26 off the abutment 27.

Movement of the detaining means is effected by the movement of any one of the slides 6 and to this end a rock shaft 37 is mounted above and adjacent the rear ends of the slides and carries an eccentrically arranged rod 38 which is arranged adjacent the rear ends of the slides 6 to be engaged by the latter to turn the rock shaft when any one of the slides 6 is moved rearwardly. Also carried by the rock shaft is an arm 39 which has a lost motion connection with the detaining means comprising a pin 40 on the arm 39 operating in a slot 41 in a link 42 which is pivoted at 43 to the detent 29. Through this means, the movement of any slide shifts the detaining means so that the driving shaft 20 moves the driven shaft 21 one turn or revolution and the driven shaft then comes to a full stop. The rotation of the driven shaft 21 operates any suitable mechanism. The lost motion connection is provided in order that the slides may shift the shafts 14, 15 and 16 before the driven shaft begins to operate.

A locking mechanism is employed having the dual function of locking a shifted slide in shifted position until the driven shaft has made its rotation and locking the other slides against movement when a slide has been shifted away from normal position. In this instance, this locking mechanism comprises a locking bar 44 carried, in this instance, by arms 45 on a rock shaft 46 which is mounted on the frame of the machine in rear of the slides. This locking bar normally lies below the slides but may be swung upwardly to engage abutments 47 and 48 on the slides. When a slide is shifted rearwardly the bar 44 shifts upwardly engaging the abutment 48 on the shifted slide and the abutments 47 on the other slides; thus holding the shifted slide against return and the non-shifted slides against shifting from normal position. The locking bar is controlled by the driven shaft 21 and to this end, the latter is provided with a cam 49 which acts on a lever 50 pivoted at 51 in rear of the shaft 21, a spring 52 urging the arm toward the cam. A link 53 is pivoted at 54 to an arm 45 of the rock shaft 46 and has a resilient connection with the arm 50 so that if the locking bar 44 meets any unexpected obstruction the parts will not break. In this instance, the link 53 has a slot 55 in which a pin 56 on the arm 50 operates, and a spring 57 is interposed between the link 53 and the arm 50. It will thus be seen that the turning of the shaft 21 moves the locking bar to and from locking position.

The operation of the invention will be understood from the foregoing but it may be summarized as follows: Depression of one of the key levers 4 shifts through its equalizing lever 9 one of the slides 6. This slide acts on the three rock shafts or setting members

14, 15 and 16 and sets them in positions determined by the lengths of the projections 19. After this movement has been completed the shifted slide acts on the clutch controlling means and establishes connection between the power driving shaft 20 and the driven shaft 21. Immediately the driven shaft starts to turn, the locking bar 44 moves into interlocking relation with the shifted member 6 to hold the latter in shifted position and also moves into interlocking relation with the non-shifted members 6 to hold them in normal position. The driven shaft continues to rotate until it performs its functions, say shifting a printing member such as a type cylinder to printing position determined by the setting shafts 14, 15 and 16 and then the clutch connection with the driving shaft 20 is broken. As the clutch stops, the cam 49 thereon permits the locking bar to return to normal non-locking position.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a key board mechanism, the combination with a supporting bar, of a key lever pivoted on the upper side of the supporting bar, slides guided on the under side of said bar, and equalizing levers pivoted to the supporting bar in advance of the pivots of the key lever and each having an arm cooperating with a key lever and an arm cooperating with the forward end of a slide.

2. A keyboard mechanism comprising a plurality of key operated slides, each provided on one side with a locking abutment, a locking bar common to all of the slides, and means operating on the movement of any one of the slides to effect the movement of the locking bar to engage the abutment on the shifted slide to hold said slide against return and also to lie in the path of the non-shifting slide to prevent the shifting.

3. A keyboard mechanism comprising a plurality of key operated slides, a rock shaft having a portion eccentric thereto and extending longitudinally thereof and arranged to be engaged by the ends of all the slides, a motor driven member and a clutch controlled by the motor driven member and controlled by said rock shaft.

4. A keyboard mechanism comprising a plurality of key operated slides, a rock shaft arranged transversely of and to one side of the slides and having an eccentrically arranged longitudinal extending portion, and projections of various lengths extending laterally from said slides and cooperating with said eccentrically arranged portion to impart to the rock shaft different amounts of movement.

5. A keyboard mechanism comprising a plurality of key levers of different lengths, a plurality of slides to which the same amount of movement is to be imparted from the key carrying levers, and a plurality of swinging

members pivoted independently of the key levers and the slides at points in advance of and above the slides and interposed between the key levers and said first mentioned members, said swinging members being of different lengths to compensate for the differences in the lengths of the key levers.

6. A keyboard mechanism comprising a slide, a key lever, and an equalizing lever pivoted above and adjacent the forward end of the slide and below the key, having two arms one extending upward and cooperating with the key lever and the other extending downwardly and cooperating with the slide.

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