March 22, 1932. M. J. TRACY ET AL 1,850,972

SELECTING AND ACTUATING MECHANISM

Filed Jan. 12, 1929 3 Sheets-Sheet 1

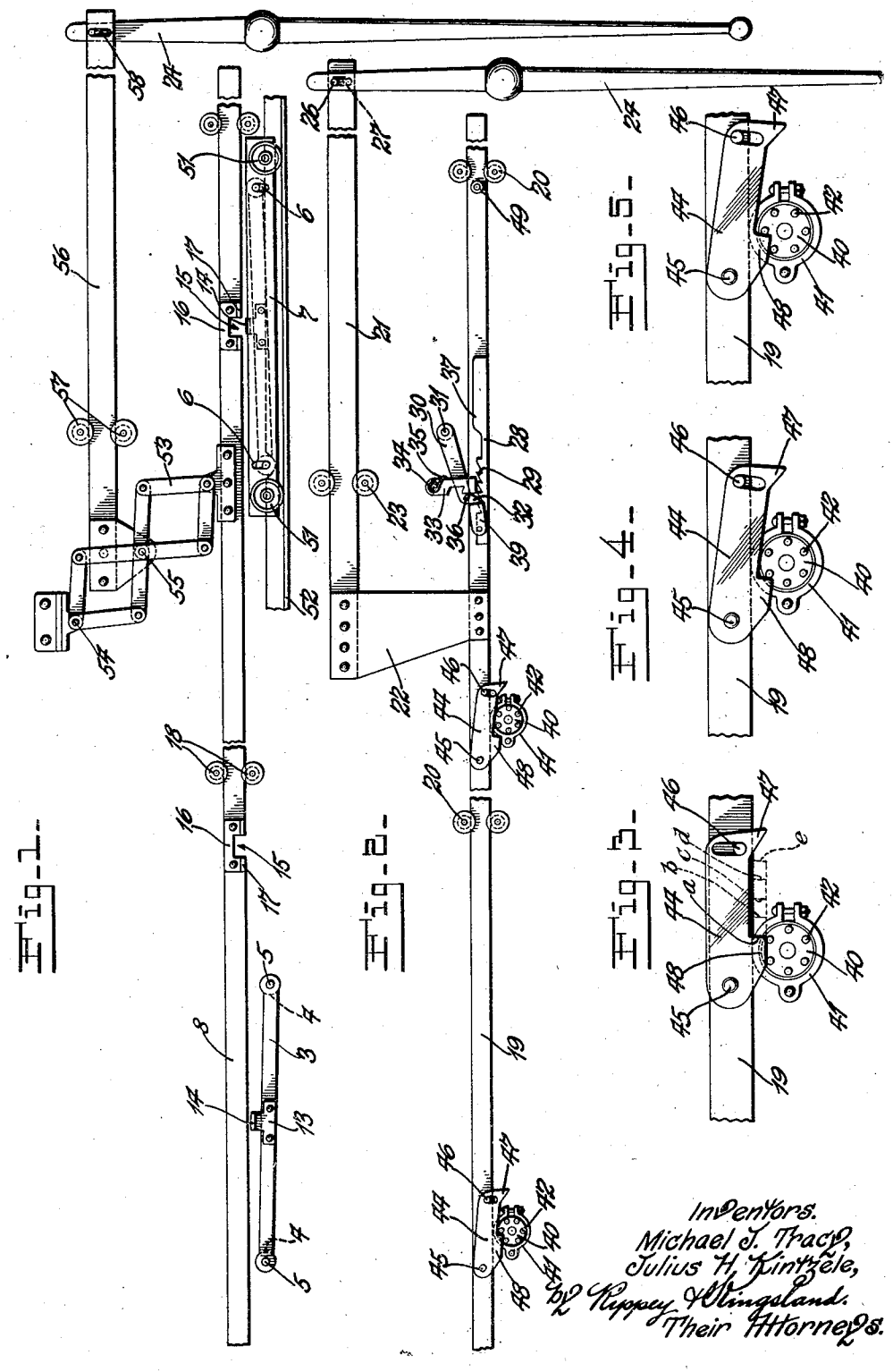


Fig-1-

Fig-2-

Fig-3-

Fig-4-

Fig-5-

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Filed Jan. 12, 1929 3 Sheets-Sheet 2

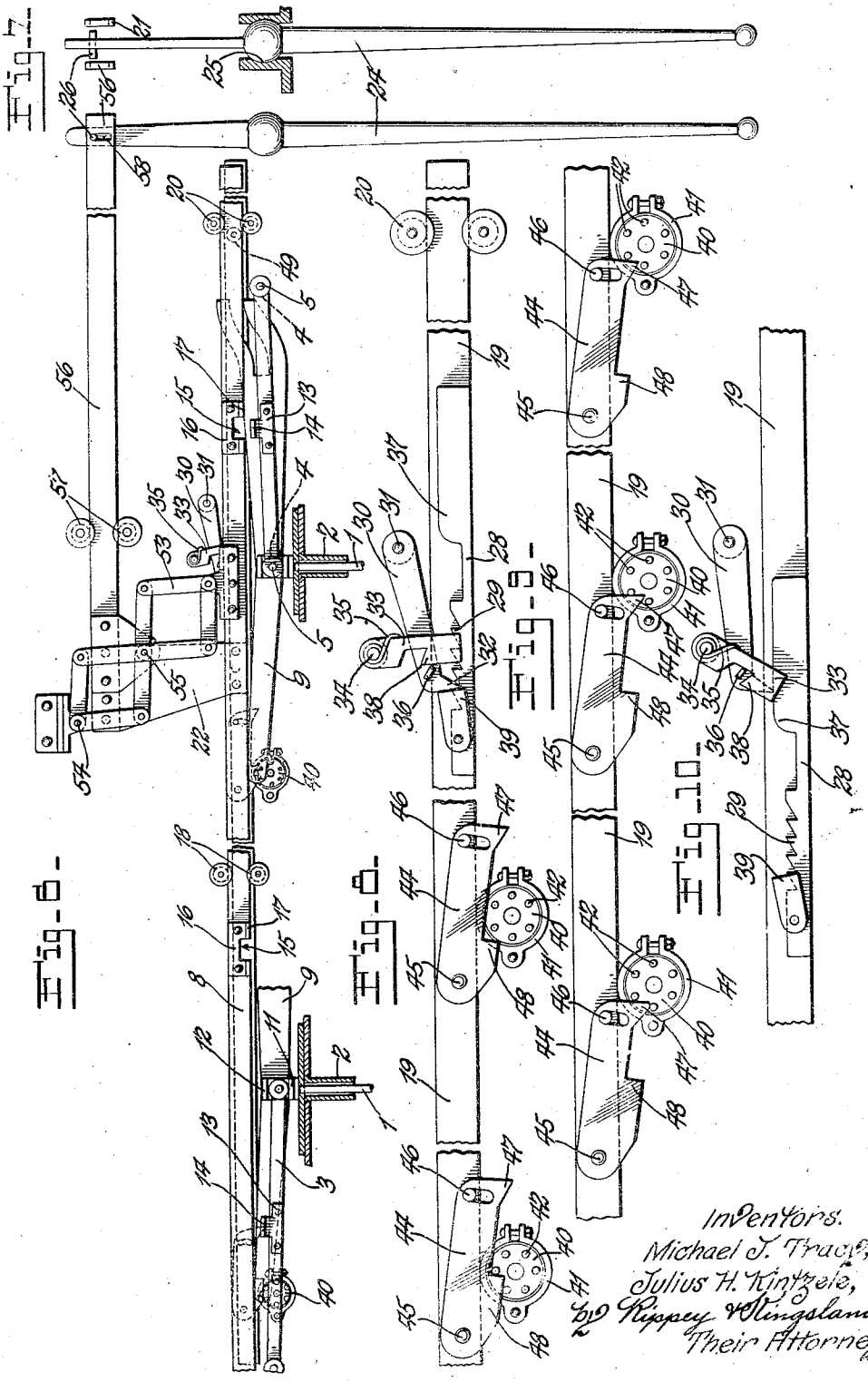


Fig. 7

Fig. 8

Fig. 9

Fig. 10

Fig. 6

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SELECTING AND ACTUATING MECHANISM

Filed Jan. 12, 1929 3 Sheets-Sheet 3

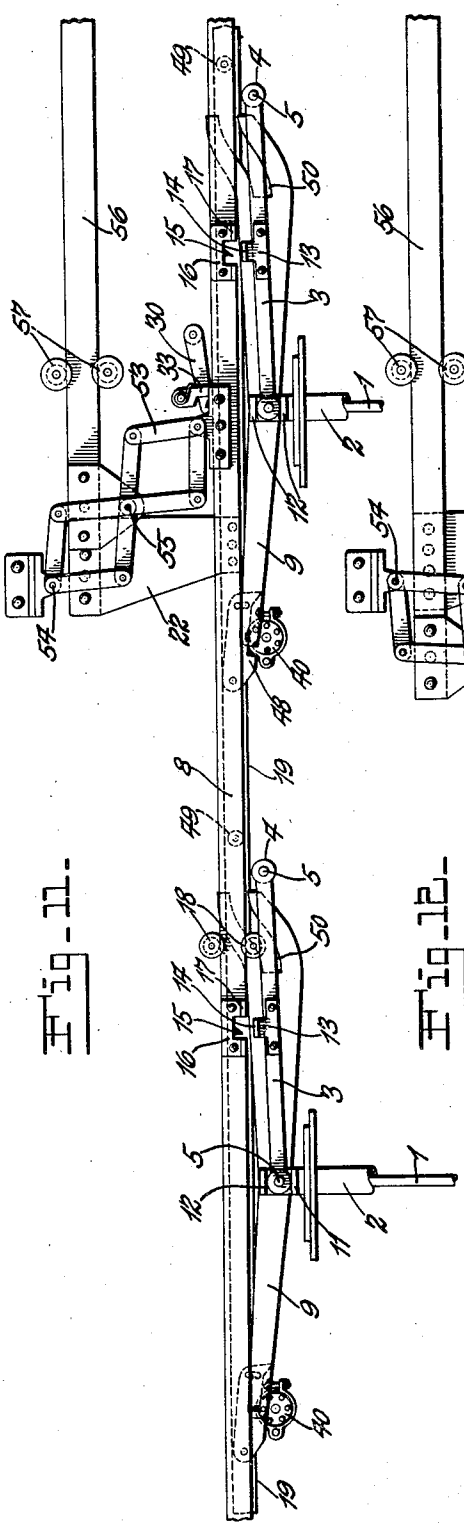


Fig. 11.

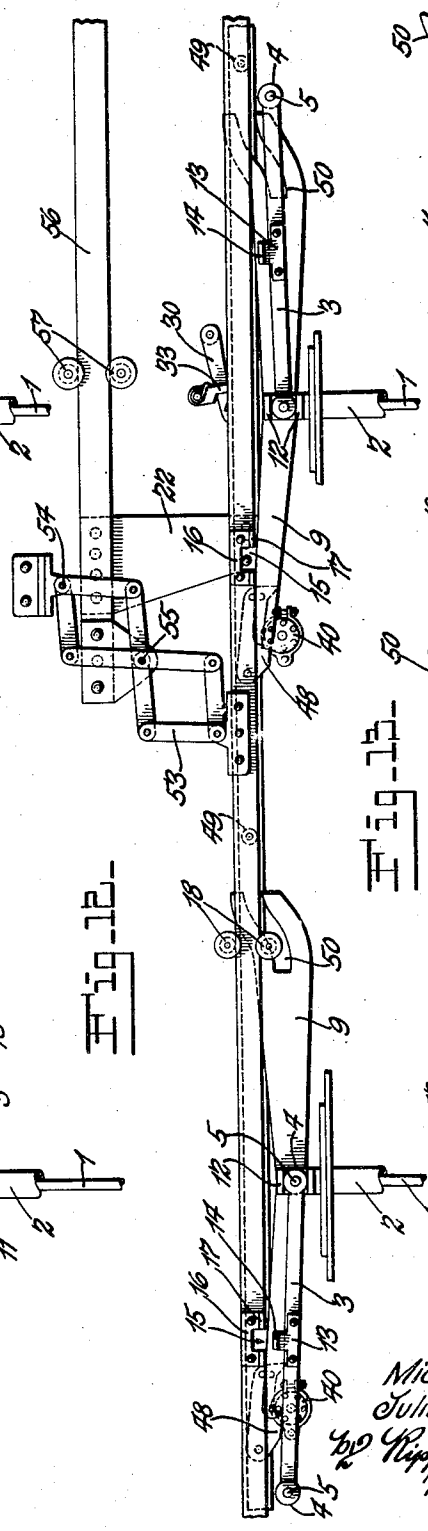


Fig. 12.

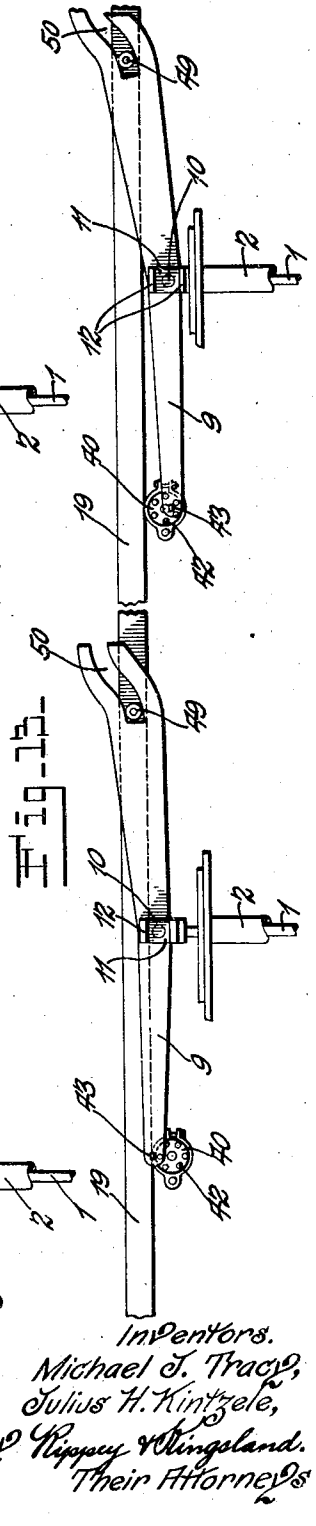


Fig. 13.

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UNITED STATES PATENT OFFICE

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SELECTING AND ACTUATING MECHANISM

Application filed January 12, 1929. Serial No. 331,997.

This invention relates to selecting and actuating mechanism; and it has special reference to a mechanism for selectively operating one or more of a series of parts.

The invention may be applied to various uses. For purpose of illustration we have chosen an embodiment wherein one or more of a number of parts may be selectively operated from one adjustment to another. These parts may typify any parts to the selective operation of which the present invention may be applied irrespective of what the function of such parts may be.

An object of the invention is to provide a mechanism capable of application to the purposes above mentioned and to any other useful purpose which the invention may satisfactorily serve.

Other objects will appear from the following description, reference being made to the drawings in which

Fig. 1 is a front elevation of parts of the actuating mechanism for moving the selected parts after they have been selected.

Fig. 2 is a front elevation showing principal elements of the selecting mechanism.

Figs. 3, 4 and 5 are front elevations of one of the selecting devices in three different positions.

Fig. 6 is a front elevation of the selecting and actuating mechanism combined, and showing one of the parts in the position to which it was actuated by the actuating mechanism after having been selected by the selecting mechanism.

Fig. 7 is a detail view showing an actuator or lever for operating the device.

Fig. 8 is a view showing two of the selecting devices and the devices by which they are controlled to select for operation one part while another part remains unoperated.

Fig. 9 is a view showing a plurality of the selecting devices in a position in which all of said devices will function to select a corresponding part for operation.

Fig. 10 is a side elevation of a latch device constituting a part of the invention.

Fig. 11 is a side elevation showing one of the selecting and operating devices after it has been positioned for operation, and another of said devices in a position in which it cannot be operated.

Fig. 12 is a side elevation of the same parts that are shown in Fig. 11 showing one of the parts in the position to which it was moved by the operating mechanism after it had been selected by the selecting mechanism, as in Fig. 11.

Fig. 13 is a view showing the position of an operating lever when it is controlled by the selecting device to operate the part to be moved and showing the position of another operating lever that is not controlled by the selecting device and which does not operate the part which is moved thereby when said lever is controlled by the selecting device.

A restatement of objects of the invention including specific reference to parts shown in the drawings will be of advantage. There is a series of parts 1 which are capable of longitudinal movements in stationary guides 2 and each of which controls a movable part 3 having on each end a roller 4. The rollers 4 are mounted on studs 5 which project through the parts 3, so that the rollers 4 are at one side of the parts 3 while the studs 5 project through said parts 3 and into slots 6 in a part 7 that is to be moved from one position to another. As will hereinafter appear, the present invention is designed and adapted to operate any selected ones or all of the parts 1 at a single operation and thereby operate any selected ones or all of the parts 3 into engagement with a longitudinal movable operating bar 8, by longitudinal movement of which all of the parts 3 that are engaged with said bar 8 will be moved longitudinally and will thereby move the parts 7 longitudinally from one position to another. A principal purpose and object of the present invention is to provide devices and mechanisms whereby selected ones or all of the parts 1 may be moved as aforesaid and thereby caused to operate and engage the corresponding parts 3 with the longitudinally movable operating bar 8 and to provide means for actuating said bar 8 longitudinally to move longitudinally the parts 3 that were engaged with said bar 8 as aforesaid; and thereby move longitudinally from one position to another the parts

7 with which the parts 3 are connected. With this object and purpose of the invention in view we now proceed to a description of the illustrated devices and mechanisms therefor.

A lever 9 is connected by a pivot 10 (Fig. 13) to a bracket 11 attached to the upper end of each of the parts 1. Each bracket 11 has a pair of laterally projecting arms 12 spaced apart, one above the other, and forming a space designed and adapted to receive the rollers 4 on the corresponding part 3. That is to say, in one position of the part 3, the roller 4 at one end is between the arms 12 of the bracket 11; and, in the other position of the part 3, the roller 4 at the opposite end of said part 3 is engaged with said bracket 11 (Figs. 6 and 12). From this it is apparent that, if one end of the lever 9 be fulcrumed and the other end of said lever be moved in a direction away from the part 1, said part 1 will be moved thereby in one direction from a starting position; and, when the lever 9 is returned to its initial position, the part 1 will thereby be moved to its starting position. Such movements of the part 1 including the bracket 11 operate the part 3 first into engagement with the operating bar 8 and then out of engagement with said bar 8. About midway of its length each part 3 is provided with an upwardly extended arm 13 having on its upper end a lateral projection 14 which, in the lower position of the lever 9, seats upon the upper edge of the part 7 (Fig. 1), causing one of the projections 5 to be at the lower end of its slot 6 and the other projection 5 to be at the upper end of its slot 6. The operating bar 8 has a notch 15 for each arm 13, which notch is also extended through a plate 16 attached to said bar 8 and having lateral projections 17 on its lower edge. In the initial or starting positions of the devices above described, one of the notches 15 is above each of the arms 13 so that, when any or all of the levers 9 are selected and operated by fulcruming one end of the selected levers and raising the opposite ends thereof, said levers will raise the connected parts 1 and thereby move the arms 13 into the notches 15. Obviously, if an arm 13 is engaged in the corresponding notch 15 and the bar 8 be then moved longitudinally, the part 3 will be moved longitudinally with said bar. And, since each part 3 is connected with a corresponding part 7, it follows that the part 7 must be moved with said part 3. The present invention includes means for selecting which levers 9 will be operated effectively to move the corresponding parts 1 and thereby the parts 3 into engagement with the bar 8 for operation thereby. The operating bar 8 is supported for longitudinal movements between guide rollers 18.

A selecting bar 19 is supported by guide rollers 20 for longitudinal movements parallel with the bar 8. An arm 21 has one end connected with the selecting bar 19 by a connection 22 and is supported for operation between guide rollers 23 (Fig. 2). A lever 24 is supported by a universal pivot 25 (Fig. 7) and has on its upper end a pin 26 movable into and out of a slot 27 in the adjacent end of the arm 21. Thus, when the pin 26 is engaged in the slot 27, said lever will move the arm 21 and thereby the selecting bar 19 longitudinally from and to a starting position and to intermediate adjusted positions. To one side of the bar 19 a selecting ratchet stop 28 (Fig. 2) is attached and is formed on its upper side with a series of ratchet teeth 29. There is at least one of said ratchet teeth for each part 1 included in the series or parts for selective operation. That is to say, as stated above, the embodiment of the invention which we have chosen for illustration is designed and adapted to select and operate any one or any number or all of the five parts 1 included in the series. Accordingly, we have shown six teeth 29; one tooth for each part 1 and one tooth for the entire series of said parts 1. Of course, the number of parts 1 to be selectively operated may be varied without departure from the principle of the invention. This may include a variation in the number of the teeth 29. In mentioning that the device is illustrated for selectively operating five parts 1 we have not intended to impose any distinction upon the scope of the invention.

A pawl 30 is pivoted upon a stationary support 31 and has a pointed end 32 which escapes over the upper ends of the teeth 29 during movement of the selecting bar 19 from its idle or starting position. Obviously, this pawl 30 will prevent the selecting bar 19 from being returned to its starting position unless said pawl 30 be disengaged from the teeth 29. The present invention includes means for disengaging the pawl 30 from the teeth 29 and holding said pawl out of engagement with said teeth 29 to permit the selecting bar 19 to be returned to its starting or idle position. A detent 33 is pivoted on a stationary support 34 and is actuated by a spring 35 against a projection 36 on one side of the pawl 30. The member 28 has a raised part 37 which will move under the end 32 of the pawl 30 as the bar 19 approaches the limit of its extent of movement from starting position. The raised portion 37 will raise the pawl 30 until the projection 36 is above a shoulder 38 on the catch 33, permitting said shoulder to move under said projection 36 and thereby support the pawl 30 in a position in which the end 32 of said pawl is above and cannot engage the teeth 29. This will permit the selecting bar 19 to be returned to its starting or idle position. And, as said bar 19 approaches its starting or idle position, an abutment 39 supported

by said bar 19 contacts with the lower end of the catch 33 and pushes said catch 33 out of engagement with the projection 36. This permits the pawl 30 to drop into contact with the member 28 preparatory for a selecting operation of the selecting bar 19.

Adjacent to one end of each of the bars 19 a disc 40 is rotatively mounted in a stationary support 41. Each disc 40 in the embodiment shown has six fulcrum pins 42 projecting laterally toward the adjacent end of the lever 9. The discs 40 rotate about axes that are parallel with the planes of the pivots 10, and are frictionally held by their supports 41 until positionly rotated as hereinafter described. Each lever 9 has a projection 43 designed and adapted to engage upon the properly positioned fulcrum pin 42 when the corresponding lever 9 has been selected for operation. But, when a lever 9 is not selected for operation, the projection 43 can move between the fulcrum pins 42. That is to say, when it is desired to operate any one of the levers 9, the corresponding disc 40 is turned to position in which one of the fulcrum pins 42 is immediately below the projection 43 on the selected lever 9; so that, when the opposite end of the lever 9 is raised (Fig. 13), the projection 43 on said lever will fulcrum upon an adjacent pin 42 and will thereby be caused to move the part 1 which, in turn, moves the part 3 to position in which the arm 13 on said part 3 is engaged in the notch 15 in the operating bar 8. The normal or idle positions of all of the discs 40 are such that no projections 43 will fulcrum upon pins 42. That is to say, in the normal or idle position of the invention, the projections 43 on all of the levers 9 are free to move between the fulcrum pins 42 on the corresponding discs 40.

For each disc 40 the selecting bar 19 supports an actuating detent 44. The detents 44 are mounted on pivots 45, extent of pivotal movements of said detents being limited by pin-in-slot devices 46. The outer end of each detent 44 is provided with a shoulder 47 and spaced therefrom the lower edge of each detent 44 is provided with another shoulder 48. The shoulders 48 are spaced from the ends 47 of the respective detents 44 according to the spacing of the teeth 29. Hence, when the selecting bar 19 is moved from starting position a distance equivalent to one ratchet tooth 29, the shoulder 48 on one of the detents 44 will be operated effectively to turn the corresponding disc 40 to place one of the pins 42 in position to function as a fulcrum for the projection 43 of the corresponding lever 9. When the selecting bar 19 is operated a distance corresponding to two ratchet teeth 29, a different one of the detents 44 will position its corresponding disc 40 so that one of the pins 42 will function as a fulcrum for the projection 43 of the corresponding lever 9, and so on.

The movement of the selecting bar 19 from starting position to position to locate a fulcrum pin 42 below the projection 43 of the selected lever 9 consists in moving said selecting bar toward the left, as shown in the drawings, to a position in which the pointed end 32 of the pawl 30 is about half way between two adjacent teeth 29. That is to say, the selecting bar 19 is moved to the left until the point 32 is about half way to the next tooth 29 beyond the tooth corresponding to the shoulder 48 of the proper detent 44. Then the selecting bar 19 is moved longitudinally in the opposite direction until the tooth 29 which had last passed the point 32 engages or abuts against said point, as shown in Fig. 2. This causes the corresponding detent 44 to move a distance sufficient for its shoulder 48 to engage one of the abutment pins 42 and thereby turn the disc 40 in a clockwise direction (Fig. 5) to position in which said abutment pin is immediately below the projection 43 of the adjacent lever 9. By this operation all other discs 40 than the one operated as above described are turned to the positions shown at the right of Fig. 13 in which the projection 43 may pass between the fulcrum pins 42. Then, if it be desired to adjust another one of the discs 40 in effective position so that one of its pins 42 will function as a fulcrum for the corresponding lever 9, the selecting bar 19 is again moved to the left the required distance for the point 32 of the pawl 30 to rest upon the inclined edge of the next tooth 29 beyond that tooth 29 that corresponds with the detent 44 that is to be used to turn the discs 40. Then the selecting bar 19 is again moved in the opposite direction, that is, to the right, as seen in Fig. 2, which will cause the proper detent 44 to turn the corresponding disc 40 to position in which one of the fulcrum pins 42 is immediately below the fulcrum projection 43 of the corresponding lever 9. This leaves out of effective position the pins 42 of all other discs than the ones that were operated as above described.

Or, if it be desirable to operate all discs 40 of the series so as to cause an abutment pin 42 on every one of said discs to function as a fulcrum for a corresponding lever 9, the selecting bar 19 is moved to the left (Fig. 2) until the last tooth 29 of the series of said teeth is beyond and to the left of the pointed end 32 of the pawl 30. This places the ends 47 of all of the detents 44 in about the positions shown in Fig. 9 so that a slight movement of the selecting bar 19 toward the right will turn all of the discs 40 a distance sufficient to place an abutment pin 42 on each disc under the projection 43 of the corresponding lever 9. Movement of the selecting bar toward the right beyond its intended position

in this operation, as in others, is stopped by engagement of the proper tooth 29 against the end of the pawl 30.

Next, the lever 24 is operated to move the selecting bar 19 toward the left a distance sufficient to cause rollers 49 on the selecting bar 19 to enter cam slots 50 in the free ends of all of the levers 9 (Fig. 13) and thus raise the free ends of said levers 9. The levers 9 which have their projections 43 fulcrumed upon pins 42 will thereby be operated effectively to move upwardly the parts 1. But, the remaining levers 9, that is to say, the levers 9 whose projections 43 do not fulcrum upon fulcrum pins 42, will simply be rocked upon their pivots 10, as shown at the right of Fig. 13, and will not move the parts 1 from their initial or starting positions. The selecting bar 19 is left in this position so as to support the levers 9 that had been operated.

As previously stated, the raising of a lever 9 raises the pivotally connected part 1 and the bracket 11, thereby raising the part 3 until the arm 13 is engaged in the notch 15 in the operating bar 8. Thereupon, the operating bar 8 is moved toward the left from its starting position, thus moving the part 3 that is engaged therewith, as aforesaid, and along with it moving the part 7. In the embodiment shown, the part 7 is a truck mounted on rollers 51 that operate along a track 52. This longitudinal movement of the operating bar 8 moves the part 3 from the position shown at the right of Fig. 12 to the position shown at the left of Fig. 12; that is to say, the part 3 is moved longitudinally a distance approximately equal to its length, which is sufficient to carry the roller 4 on the left end of said part 3 beyond the bracket 11 and to engage in the bracket 11 the roller 4 on the right end of said part 3. Thus, as many of the parts 3 as had been selected will be moved.

A system of tong levers 53 has its upper end pivoted to a stationary support 54 and its lower end pivoted to the operating bar 8 and its intermediate portion connected by a pivot 55 with one end of an actuating slide 56 operatively mounted between guide rollers 57. The slide 56 has a slot 58 near its outer end corresponding to the slot 27 that is in the end of the arm 21. In the embodiment shown, the lever 24 may be shifted to disengage the pin 26 from the arm 21 and to engage said pin with the slide 56 in order to operate said slide and thereby the operating bar 8, as described. The system of tong levers 53 will move the operating bar 8 twice the distance which the slide 56 is moved.

In order to restore the parts to their starting positions, the operating bar 8 is returned to its starting position by operation of the lever 24. Then the lever 24 is disengaged from the slide 56 and is oscillated to engage the pin 26 with the arm 21. Then the lever 24 is operated to move the arm 21 and thereby the selecting bar 19 to their idle or starting positions, all approximately as shown in Fig. 6 in which no fulcrum pins 42 are below projections 43.

In the idle or starting position of the device the operating bar 8 is in a position in which all of the notches 15 are above the projections 13—14 so that, when the respective parts 3 are raised, said projections 13—14 will engage in the respective notches 15. Then, when the operating bar 8 is moved longitudinally, it will move with it the parts 3 which are engaged therewith and will also move the parts 7 which have their parts 3 engaged with the bar 8. Further, in the normal or idle position, the selecting bar 19 is in a location in which the pointed end 32 of the pawl 30 seats upon the rachet stop element 28 between the selecting bar 19 and the abutment 39 and inwardly, that is, to the left, as seen in Figs. 2 and 8, beyond the last tooth 29. In this location of the selecting bar 19 all of the detents 44 are supported in a raised position, as shown in Fig. 3, because the lower edges of the shouldered portions 48 of said detents are seated upon and supported by the pins 42. We have already explained that the shoulders 48 on the respective detents 44 are different distances from the ends 47 of said detents to coordinate the devices in the positions of said shoulders 48 with the distances between the teeth 29. Thus, in Fig. 3 in solid lines, one of the shoulders 48 is shown and the shoulder on the next detent would be approximately at the solid line *a*, and the others at approximately the positions *b*, *c*, *d* and 4, respectively. Hence, a movement of the selecting bar 19 to the left a distance equal to about the length of a tooth and a half 29 will move the detent 44 shown in solid lines (Fig. 3) to about the position shown in Fig. 4, while the remaining detents will be upheld because their shouldered portions 48 remain seated upon pins 42. Then a movement of the selecting bar 19 a distance equal to the length of about one-half of a tooth 29 will turn the disc 40 from the position shown in Fig. 4 to the position shown in Fig. 5 in which the uppermost pin 42 is directly below the projection 43 of the adjacent lever 9 so as to function as a fulcrum for said lever 9. Then, after the selecting bar 19 has been moved to the right a distance equal to about one-half the space of a tooth 29, one of the pins 42 having been positioned under a corresponding projection 43, as stated, the selecting bar 19 is next moved to the full extent of its movement toward the left (Fig. 13) causing the rollers 49 to operate in the cam slots 50 of all of the levers 9. Accordingly, that lever 9 which has its projection over the pin 42, which had been positioned as aforesaid, will be raised, thereby moving the part 1 from its lower position to its up-

per position and thereby engaging the projection 13—14 of the corresponding part 3 in the adjacent notch 15 of the operating bar 8.

Next, the lever 24 which had been manipulated to operate the bars 8 and 19, as above described, may again be manipulated to actuate the bar 19 toward the left, as shown in the drawings, to its starting position, thereby permitting the part 1, the lever 9 and the part 3 to return to their initial or starting positions. Then, in order to restore the parts 3 and 7 to their starting positions, it is only necessary to move the selecting bar 19 the full distance to the left which again raises the lever 9 and thereby re-engages the part 13—14 of the part 3 that had been moved in the notch 15 of the operating bar 8. Then the lever 24 is manipulated to move the operating bar to its starting position, and is further manipulated to restore the selecting bar 19 to its starting position, thus permitting the parts 1, their levers 9 and the parts 3 to be restored to their starting positions in which all of the parts 3 are disengaged from the operating bar 8.

From the foregoing it must be apparent that our invention constitutes a useful selecting and actuating mechanism for selectively moving different parts, elements, latches or carriages from one position to another. In this way the invention finds useful application in different embodiments and is obviously capable of wide variation as to construction and arrangement. Accordingly, we do not restrict ourselves in any unessential respects, but what we claim and desire to secure by Letters Patent is:—

1. The combination with a longitudinally movable operating bar, of a series of movable parts, another part engaging each of said movable parts and mounted for movement in a direction at an angle to the direction of movement of said first named part, mechanism for selectively operating said other parts to engage said first named parts simultaneously or selectively with said operating bar, an actuator for moving said mechanism to move any selected ones of said other parts to engage said first named parts simultaneously or selectively as desired, and mechanism for operating said operating bar to move said first named parts after engagement therewith as aforesaid.

2. Mechanism of the character described comprising a longitudinally movable bar, means for operating said bar longitudinally from and to a starting point, a series of movable parts normally out of engagement with said bar, mechanism for simultaneously or selectively engaging said movable parts with said bar, and an actuator for moving said mechanism to move any selected ones of said movable parts to engage said bar simultaneously or selectively as desired.

3. Mechanism of the character described comprising a longitudinally movable operating bar, elements supported for movement from and to a starting position, parts in connection with said elements movable to and from engagement with said operating bar, means normally holding said parts out of engagement with said operating bar, mechanism for operating said means to move said elements simultaneously or selectively into engagement with said operating bar, an actuator for operating said mechanism to move said elements into engagement with said operating bar simultaneously or selectively as desired, and means for operating said operating bar to move said parts and thereby said elements from and to their starting position.

4. Mechanism of the character described comprising a longitudinally movable operating bar, elements supported for movement from and to a starting position, mechanism for simultaneously or selectively engaging said elements with said bar, an actuator for operating said mechanism to move said elements into engagement with said operating bar simultaneously or selectively as desired, and means operative by a part of said mechanism for moving said operating bar longitudinally from and to a starting position.

5. Mechanism of the character described comprising stationary guides, parts mounted for movement in said stationary guides, an operating bar movable longitudinally in a plane approximately at right angles to the plane of movement of said parts, selecting mechanism for simultaneously or selectively operating said parts, devices operative by said parts into and out of engagement with said operating bar, and means for operating said operating bar to move said devices after said devices have been engaged with said operating bar.

6. Mechanism of the character described comprising stationary guides, parts mounted for movement in said stationary guides, an operating bar movable longitudinally in a plane approximately at right angles to the plane of movement of said parts, selecting mechanism for simultaneously or selectively operating said parts, devices operative by said parts into and out of engagement with said operating bar, means for operating said operating bar to move said devices after said devices have been engaged with said operating bar, and other movable parts controlled and moved by said devices.

7. Mechanism of the character described comprising a series of longitudinally movable parts, levers pivoted in connection with said parts, fulcrums for said levers respectively, selecting mechanism for positioning a fulcrum for any one of said levers and leaving said fulcrums for said other levers in ineffective positions, and mechanism for operating said levers for which fulcrums have been effective-

ly positioned as aforesaid, and thereby operating said parts.

8. Mechanism of the character described comprising a series of longitudinally movable parts, levers pivoted in connection with said parts, fulcrums for said levers respectively, selecting mechanism for positioning a fulcrum for any one of said levers and leaving said fulcrums for said other levers in ineffective positions, mechanism for operating said levers for which fulcrums have been effectively positioned as aforesaid, and thereby operating said parts, devices for movement from and to a starting position connected with said movable parts respectively, and means for operating from and to starting position the devices which are connected with said movable parts which are operated as aforesaid.

9. Mechanism of the character described comprising parts supported for lateral movement from and to starting positions, a longitudinally movable operating bar, elements in connection with said parts movable into and out of engagement with said operating bar, mechanism for moving any desired number of said elements simultaneously or selectively into and out of engagement with said operating bar, and an actuator for operating said mechanism to move said elements into engagement with said operating bar simultaneously or selectively as desired.

10. Mechanism of the character described comprising longitudinally movable parts, a lever pivoted to each of said parts, fulcrums for said levers respectively movable into and out of effective positions and when out of effective positions permitting idle movements of said levers, mechanism for selectively positioning fulcrums in effective positions whereby movements of said levers will operate said parts, a sliding bar, and means for operating all of said levers by said bar.

11. Mechanism of the character described comprising longitudinally movable parts, a lever pivoted to each of said parts, fulcrums for said levers respectively movable into and out or effective positions and when out of effective positions permitting idle movements of said levers, mechanism for selectively positioning fulcrums in effective positions whereby movements of said levers will operate said parts, a sliding bar for operating said levers, and mechanism for operating said bar and thereby said levers to move said parts.

12. Mechanism of the character described comprising longitudinally movable parts, a lever pivoted to each of said parts, fulcrums for said levers respectively movable into and out of effective positions and when out of effective positions permitting idle movements of said levers, mechanism for selectively positioning fulcrums in ineffective positions whereby movements of said levers will operate said parts, mechanism for operating said levers to move said parts, devices supported for lateral movement from and to starting positions, and elements for moving said devices by said bar and movable into engagement with said bar by said parts.

13. The combination with a part to be moved, of a lever for moving said part, an actuator for oscillating said lever, a detent, a fulcrum for said lever, and means for causing said detent to move said fulcrum to and from position to cooperate with said lever.

14. The combination with a part to be moved, of a lever for moving said part, an actuator for oscillating said lever, a fulcrum for said lever, and a detent for moving said fulcrum to one position in which it will cooperate with said lever and to another position in which it will not cooperate with said lever.

15. The combination with a number of parts to be moved, of a lever for moving each of said parts, a sliding bar for operating said levers, and fulcrums selectively settable to cooperate with selected ones of said levers.

16. The combination with a number of parts to be moved, of a lever for moving each of said parts, a sliding bar for operating said levers, and fulcrums selectively settable to cooperate with selected ones of said levers to cause said levers to operate said parts when the corresponding fulcrums are in position to cooperate with said levers and permitting said levers to operate without operating said parts when said fulcrums are out of position to cooperate with said levers.

17. The combination with a part to be moved, of a lever for moving said part, an actuator for operating said lever, a fulcrum for said lever, means for moving said fulcrum to and from position to cooperate with said lever, an element to be moved from and to a starting position, a bar for moving said element from and to said starting position, and means for operatively connecting said element with said bar by said part when said part is moved by said lever.

18. The combination with a part to be moved, of a lever for moving said part, an actuator for oscillating said lever, a fulcrum for said lever, means for moving said fulcrum to one position in which it will cooperate with said lever to cause said lever to move said part when said lever is oscillated and for moving said fulcrum to another position in which it will not cooperate with said lever and will permit said lever to be oscillated without moving said part, an element to be moved from and to a starting position, a bar for moving said element from and to said position, and means operated by said part for coupling said element with said bar when said lever is operated against said fulcrum.

19. The combination of a number of parts to be moved, of levers for moving said parts

respectively, means for operating said levers, fulcrums for said levers, means for setting said fulcrums selectively in position to cooperate with selected ones of said levers in order to cause said levers to move the corresponding ones of said parts when said levers are operated, elements to be moved from and to a starting position, an actuator for said elements, and means operated automatically and as an incident to movement of said parts by said levers for coupling said elements with said actuator.

20. The combination with a number of parts to be moved, of levers for moving said parts respectively, means for operating said levers, fulcrums selectively settable to cooperate with selected ones of said levers to cause said levers to operate said parts when the corresponding fulcrums are in position to cooperate with said levers and permitting said levers to operate without operating said parts when said fulcrums are out of position to cooperate with said levers, elements to be moved from and to a starting position, an actuator for moving said elements from and to said position, and means operated by said parts for coupling said elements with said actuator when said parts are moved by said levers as aforesaid.

21. The combination with a part to be moved, of a lever, a pivot connecting said lever with said part, a movable fulcrum, a device for holding said fulcrum in any position in which it is placed, a selecting device for moving said fulcrum to one position in which it will cooperate with said lever and to another position in which it will not cooperate with said lever, an element to be moved from and to a starting position, an actuator for moving said element from and to said position, a coupling for connecting said element with said actuator, means for operating said lever and thereby said part when said fulcrum is in position to cooperate with said lever, and means operating automatically and as an incident to movement of said part by said lever for connecting said coupling with said actuator.

22. The combination with an actuator, of a number of devices to be moved from and to a starting position, couplings for connecting said devices with said actuator, mechanism for moving said couplings selectively or simultaneously into and out of connection with said actuator, and an actuator for operating said mechanism and movable to different selected positions to cause said mechanism to move said couplings into and out of connection with said first actuator selectively or simultaneously as desired.

23. The combination with an actuator, of a number of devices to be moved from and to a starting position, couplings for connecting said devices with said acutator, levers for moving said couplings into and out of connection with said actuator, a selecting bar for operating said levers selectively or simultaneously, and devices controlled by said selecting bar controlling effective operation of selected ones of said levers by said selecting bar.

24. The combination with a number of parts to be moved, and a lever pivotally mounted on each of said parts, of an actuator movable in one direction to operate said levers in a direction to move said parts from a starting position and in another direction to move said parts to said starting position, and mechanism for selecting which one or more of said levers will move the parts with which they are pivoted when said actuator is moved as aforesaid.

25. The combination with a number of elements to be moved from and to starting positions, of an actuator for moving all of said elements from and to said starting positions, couplings for operating said elements by said actuator, and a single manually operated device for selectively moving one or simultaneously more than one of said couplings into and out of engagement with said actuator.

26. The combination with a number of parts to be moved from and to starting positions, of an actuator for moving all of said parts from and to said starting positions, levers controlled by said actuator for moving said parts as aforesaid, elements to be moved from and to starting positions in a direction approximately transversely of the direction of movement of said parts, and mechanism controlled in part by said parts for moving said elements from and to said starting positions.

27. The combination with a number of parts to be moved from and to starting positions, of an actuator for moving said parts selectively from and to said starting positions, an operating bar, elements movable from and to starting positions transversely of the planes of movement of said parts, coupling movable to connect and disconnect said elements with said operating bar, and means for operating said couplings by said parts.

28. The combination with a part to be moved, of a lever for moving said part, a rotary member, a fulcrum on said member for said lever, and means for rotating said member to move said fulcrum to and from position to cooperate with said lever.

29. The combination with a part to be moved, of a lever for moving said part, a rotary member, a fulcrum on said member for said lever, means for rotating said member to move said fulcrum to and from position to cooperate with said lever, and an actuator for oscillating said lever to move said part when said fulcrum is in position to cooperate with said lever.

30. The combination with a part to be

moved, of a lever for moving said part, a rotary member, a fulcrum on said member for said lever, means for rotating said member to move said fulcrum to and from position to cooperate with said lever, and an actuator for oscillating said lever to move said part when said fulcrum is in position to cooperate with said lever, said lever being given an idle movement by said actuator when said fulcrum is out of position to cooperate with said lever.

31. The combination with a number of parts movable from and to starting positions, of levers for moving said parts respectively, fulcrums for said levers, rotary supports on which said fulcrums are mounted, and mechanism for selectively rotating said supports to position fulcrums for selected ones of said levers.

32. The combination with a number of parts movable from and to starting positions, of levers for moving said parts respectively, fulcrums for said levers, rotary supports on which said fulcrums are mounted, mechanism for selectively rotating said supports to position fulcrums for selected ones of said levers, and means controlled by said mechanism for operating said levers to move said parts.

33. Mechanism of the character described comprising a number of parts to be moved from and to starting positions, a lever pivoted to each of said parts, fulcrums for said levers respectively, a selecting device movable in opposite directions, means for moving said selecting device in opposite directions, means operated by said selecting device as an incident to movement of said device in opposite directions for selectively setting fulcrums to cooperate with corresponding levers, and mechanism for operating said levers after said fulcrums have been set.

34. Mechanism of the character described comprising a number of parts to be moved from and to starting positions, a lever pivoted to each of said parts, fulcrums for said levers respectively, a selecting device movable in opposite directions, means for moving said selecting device in opposite directions, means operated by said selecting device as an incident to movement of said device in opposite directions for selectively setting fulcrums to cooperate with corresponding levers, mechanism for operating said levers after said fulcrums have been set, elements to be moved from and to starting positions, an operating bar, and means operated by said parts for coupling said elements with said operating bar in order to permit movement of said elements by said bar.

35. A device of the character described comprising an element movable from and to a starting position, an operating bar, a coupling in connection with said element, a part for moving said coupling into and out of engagement with said operating bar, a lever for operating said part, means for operating said lever, and a fulcrum movable to and from position to cooperate with said lever.

36. The combination with elements to be moved from and to starting positions, an operating bar for moving said elements from and to starting positions, couplings in connection with said elements, selecting devices, and means for operating said selecting devices to make selection of which couplings will be moved to engagement with said bar, of a member operative first to operate said selecting devices and then to operate said bar.

37. The combination of a longitudinally movable selecting bar, a longitudinally movable operating bar, a number of elements movable from and to starting positions, couplings for operatively connecting said elements with said operating bar, means for selectively connecting one or more said couplings with said operating bar, and means for operating said bar.

38. The combination of two longitudinally movable bars, pivotally supported levers, mechanism for effectively operating selected ones of said levers by one of said bars, and elements movable into and out of engagement with the other bar by said levers.

39. The combination of two longitudinally movable bars, pivotally supported levers, mechanism for effectively operating selected ones of said levers by one of said bars, elements movable into and out of engagement with the other bar by said levers, and means for operating said other bar to move said elements from and to starting positions.

40. Mechanism of the character described comprising a movable part, a lever pivotally supported intermediate of its ends on said part, and mechanism for optionally operating said lever to move said part or to leave said part stationary, as desired.

41. Mechanism of the character described comprising a movable part, a lever pivotally supported on said part, and mechanism for optionally operating said lever to move said part or to leave said part stationary, as desired, in combination with an element to be moved from and to a starting position, an operating bar, and means operated by said part for coupling said element with said operating bar.

42. Mechanism of the character described comprising a longitudinally movable part, a lever, a pivot supporting said lever in connection with said part, a fulcrum for said lever beyond one side of said pivot, and mechanism for engaging said lever beyond the opposite side of said pivot and operating said lever on said fulcrum to move said part or to rock said lever about its pivot and out of engagement with said fulcrum, as desired.

43. Mechanism of the character described comprising a longitudinally movable part, a

lever, a pivot supporting said lever in connection with said part, a fulcrum for said lever, mechanism for operating said lever on said fulcrum to move said part or to rock said lever about its pivot and out of engagement with said fulcrum, as desired, an element movable from and to a starting position, an operating bar, means operated by said part for coupling said element with said bar, and means for operating said bar.

44. Mechanism of the character described comprising a longitudinally movable selecting bar, a longitudinally movable operating bar, elements movable from and to a starting position, couplings for connecting said elements with said operating bar, and devices selectively operative by said selecting bar for connecting selected ones or simultaneously more than one of said couplings with said operating bar, as desired.

45. Mechanism of the character described comprising a longitudinally movable selecting bar, a longitudinally movable operating bar, elements movable from and to a starting position, couplings for connecting said elements with said operating bar, devices selectively operative by said selecting bar for connecting selected ones or simultaneously more than one of said couplings with said operating bar, as desired, and an actuating device for actuating said bars independently of each other.

46. Mechanism of the character described comprising a lever to be operated, a pivot on which said lever is mounted, a fulcrum for said lever, a device for operating said lever, said means operated by said device for moving said fulcrum into and out of position to cooperate with said lever.

47. Mechanism of the character described comprising a part to be operated, a lever pivotally supported by said part, a fulcrum for said lever, a device for operating said lever, and mechanism operated by said device for moving said fulcrum to and from position to cooperate with said lever to cause said lever to operate said part when said lever is operated or to leave said part stationary, as desired.

48. Mechanism of the character described comprising a part to be operated in one direction, an element to be moved in another direction, a lever for operating said part, an operating bar, a coupling operated by said part for connecting said element with said operating bar, and mechanism for operating said lever effectively to move said part or not, as desired.

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