June 6, 1944. R. J. MILLER 2,350,365

COPYHOLDER

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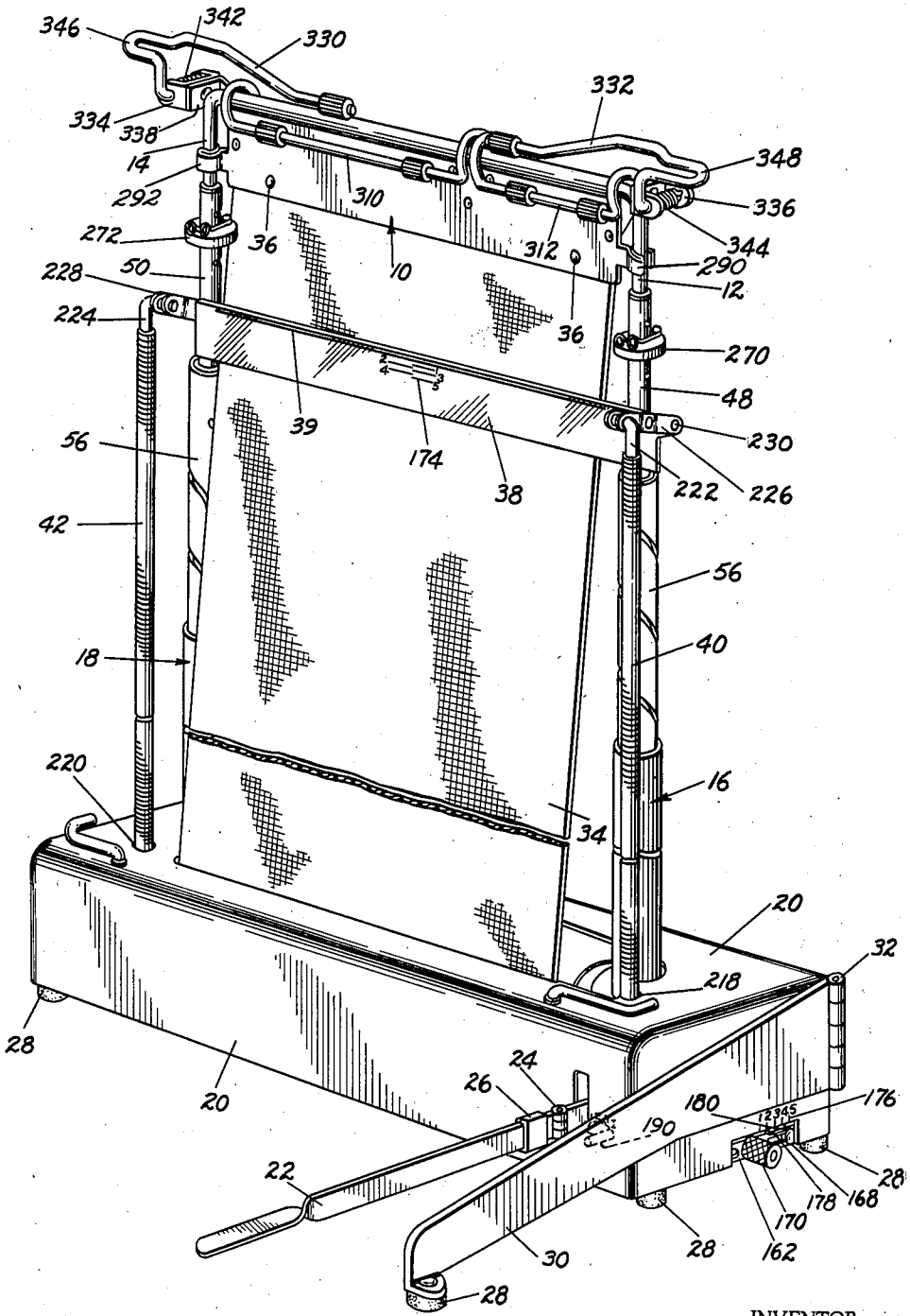


FIG. 1.

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COPYHOLDER

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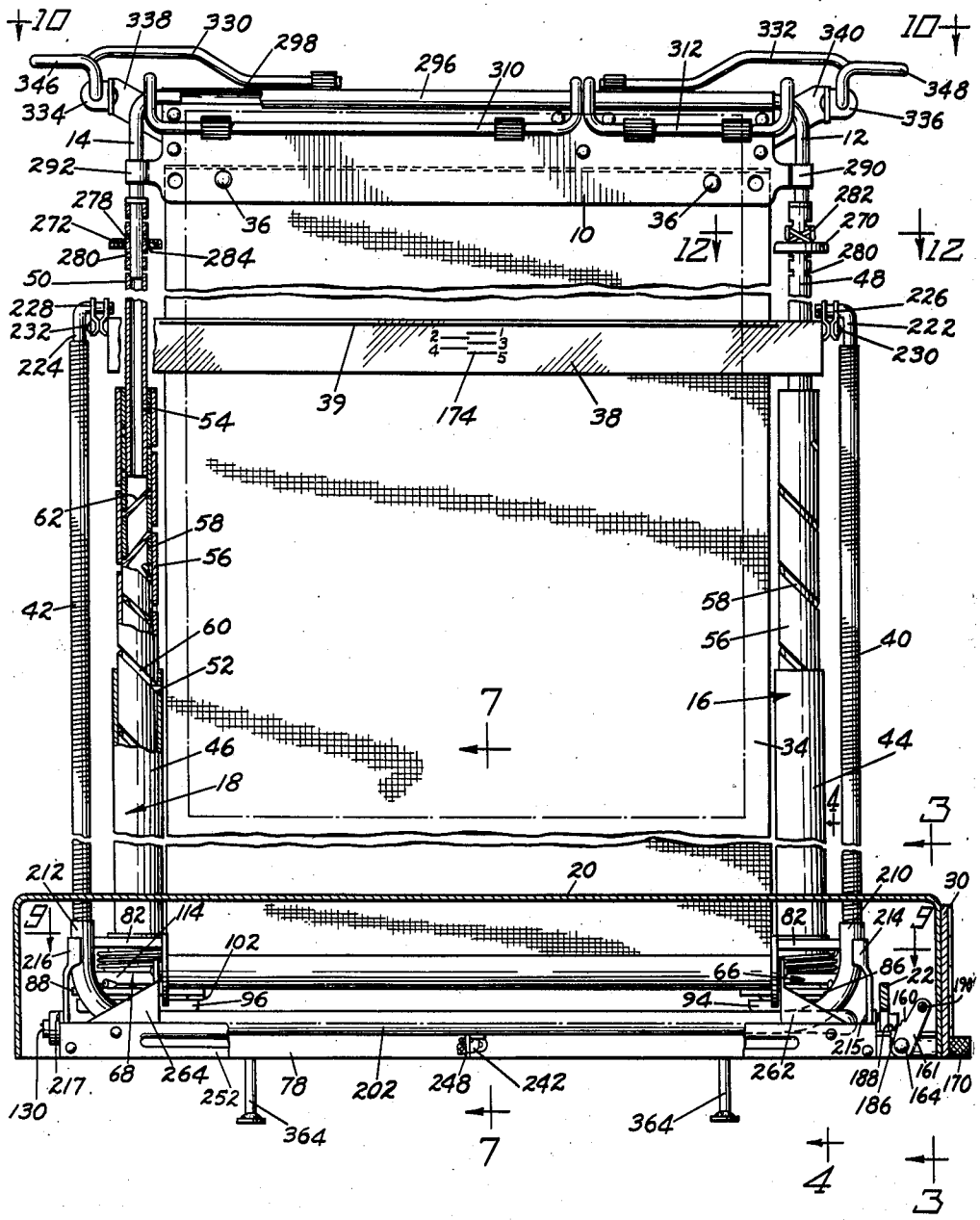


FIG. 2.

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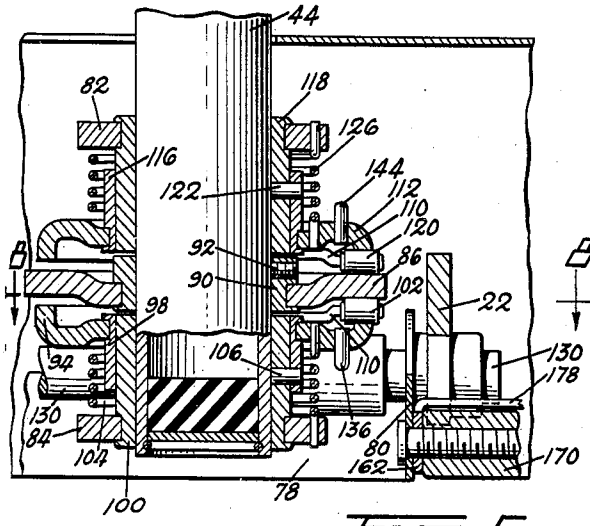


Fig. 5.

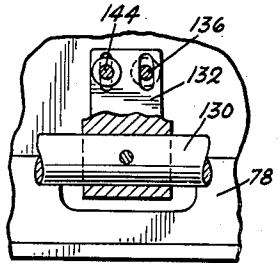


Fig. 6.

Fig. 3.

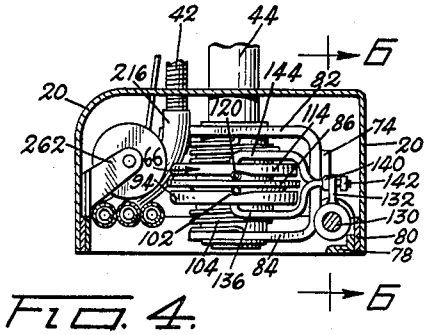


Fig. 4.

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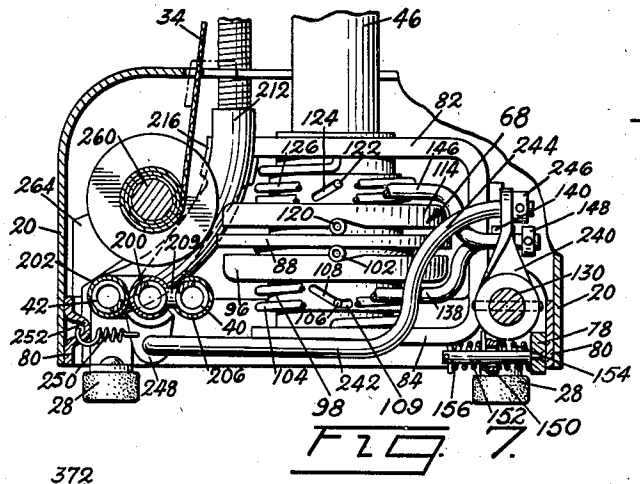


Fig. 7.

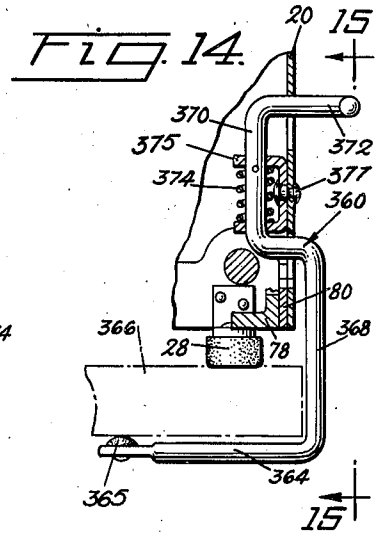


Fig. 14.

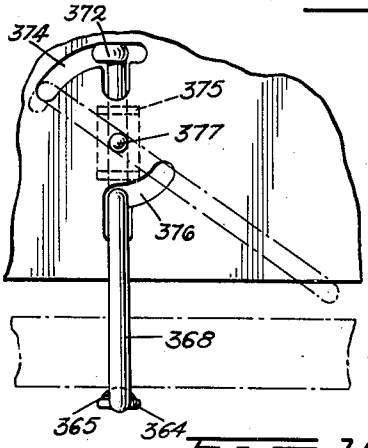


Fig. 15.

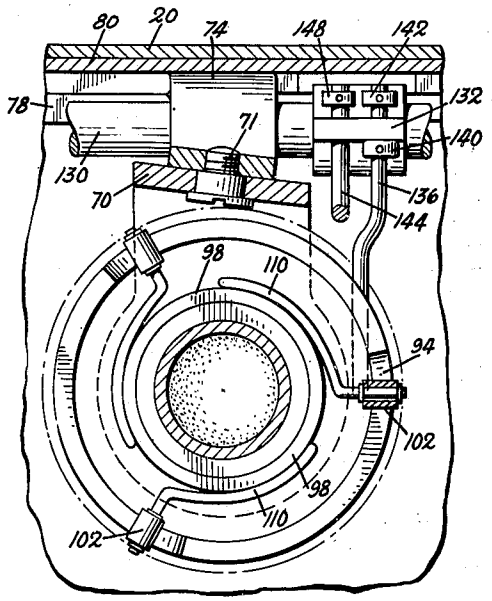


Fig. 8.

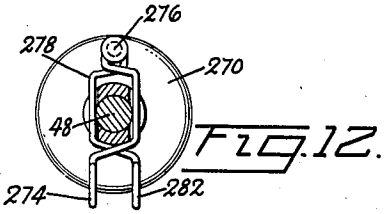


Fig. 12.

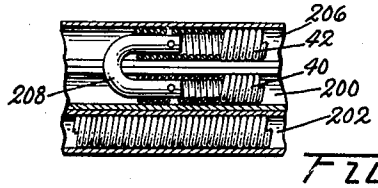


Fig. 13.

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COPYHOLDER

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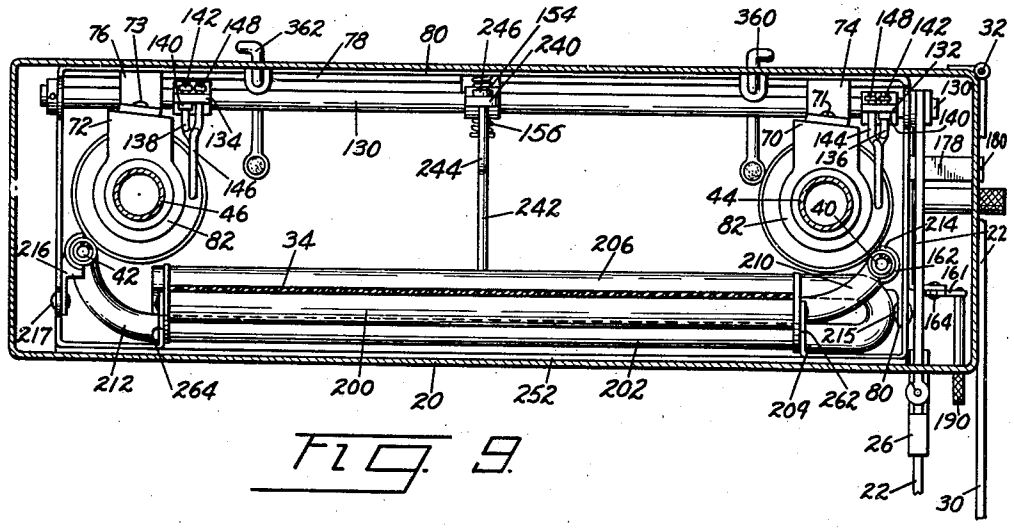


Fig. 9.

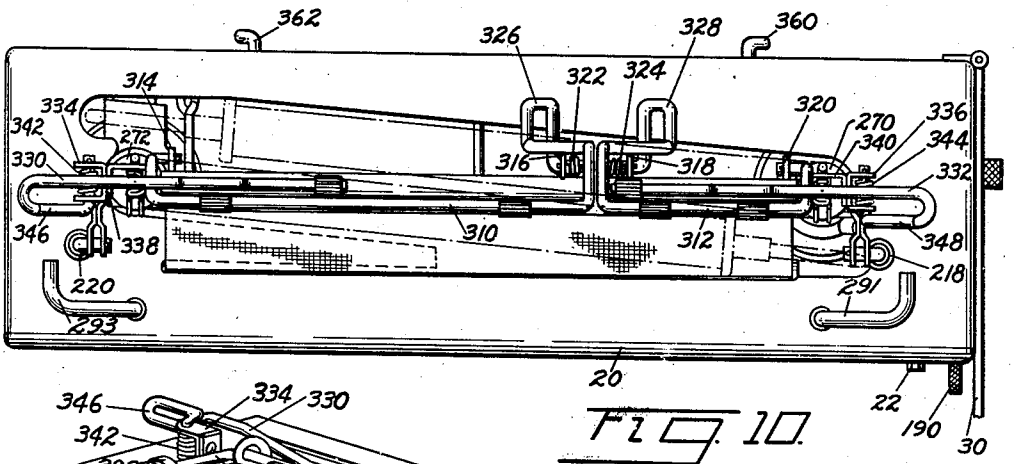


Fig. 10.

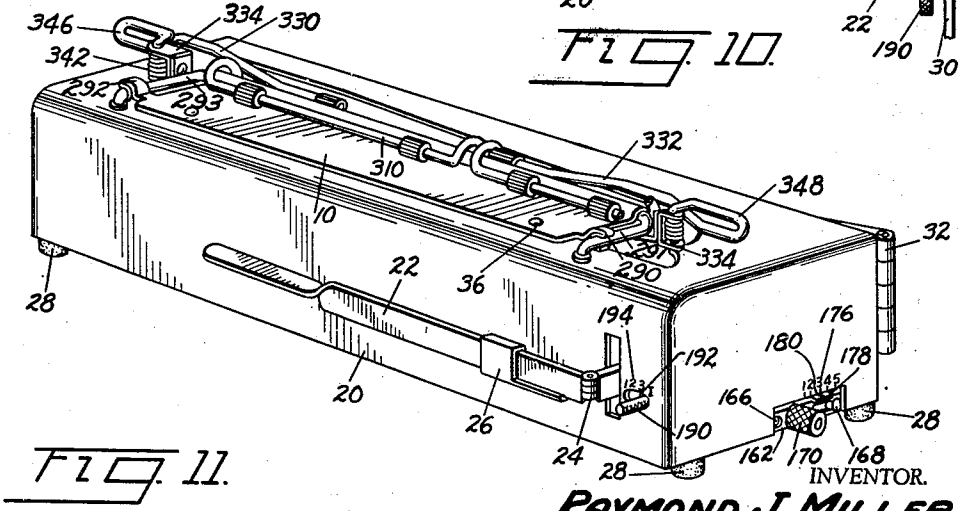


Fig. 11.

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UNITED STATES PATENT OFFICE

2,350,365

COPYHOLDER

Raymond J. Miller, Detroit, Mich., assignor to American Pattern and Manufacturing Co., a copartnership consisting of said Miller and Alfred E. Wilson, Detroit, Mich.

Application August 12, 1941, Serial No. 406,527

25 Claims. (Cl. 120—29)

This invention relates to copyholders for supporting material to be copied and more particularly to a holder of the type wherein relatively movable copy carrying and sighting members are movable relatively to each other by novel and improved manually operable means.

Copyholders of the types heretofore developed have not been entirely satisfactory for a number of reasons. For example, some of the more objectionable features are that the adjustments for controlling the line spacing movements of the relatively movable members are so complicated that they are used by only a few operators; the devices are not of such compact form that they can be stored in an operative position with a typewriter in the compartment of a desk; they cannot be collapsed to a compact form whereby they can be readily carried; one of the relatively movable members does not disengage the copy before the copy is returned to a first line indicating position and therefore care must be exercised to avoid ruffling the pages being copied; and it is difficult to clamp the material being copied to the copy carrying member.

An object of this invention is therefore to provide a copyholder of improved and simplified design which may be readily used by inexperienced operators to accurately follow line spacings of varying dimensions.

A further object of the invention is to provide a copyholder of compact and rugged design which may be readily stored in an operative position with a typewriter, and which may be collapsed to a compact inoperative position of generally rectangular shape whereby it may be readily carried.

Another object is to provide an improved actuating mechanism for a copy carrying member whereby substantially equal forces are applied at spaced points through improved motion transmitting means to actuate opposite sides of the copy carrying member in unison.

Yet a further object of the invention resides in the provision of readily accessible manually operable means for adjusting the movement of the copy carrying member to correspond with varying line spacings of material being copied, and separate manually operable control means to permit movement of the copy carrying member a single line space or a plurality of line spaces by actuation of a conveniently located operating lever.

Still another object is to provide interconnected oppositely extending motion transmitting means for supporting a vertically adjustable sighting bar in such a manner that in any vertically adjusted position the sighting bar remains horizontal.

A further object of the invention is to provide means for elevating a copy carrying member relative to a sighting bar and manually operable releasing means for the copy carrying member interconnected with sighting bar supporting members in such a manner that the supporting members are moved angularly relative to the copy carrying member to space the sighting bar from the copy carrying member before the copy carrying member is released to return to a first line position.

Yet a further object of the invention is to provide a copyholder having spaced interconnected rigid motion transmitting means for elevating and lowering a copy carrying member relative to a sighting bar.

Still another object is to provide a copyholder having nested telescoping tubes for supporting and controlling the vertical position of a copy carrying member, the tubes being pivotally mounted on a supporting member in such a manner that they may be folded to a collapsed inoperative position to facilitate carrying the device.

Another object of the invention resides in provision of an improved copyholder having relatively movable copy carrying and sighting members controlled by novel interconnected motion transmitting means in such a manner that as the copy carrying member is returned to a starting position the sighting and copy carrying members move apart to avoid ruffling of the material carried by the copy carrying member.

A further object of the invention is to provide positively actuated spaced simultaneously controlled motion transmitting means for actuating spaced supporting columns for a copy carrying member of a copyholder.

Still another object is to provide an improved copyholder of simplified design which may be economically manufactured.

Other objects and advantages of this invention will be apparent from the following detailed description considered in connection with the accompanying drawings, submitted for purposes of illustration only, and not intended to define the scope of the invention, reference being had for that purpose to the subjoined claims.

In the drawings wherein similar reference characters refer to similar parts throughout the several views:

Fig. 1 is a perspective view of the complete copyholder in the operative position.

Fig. 2 is a front elevation, partly in section, of a copyholder, taken substantially on the line 2—2 of Fig. 3 looking in the direction of the arrows.

Fig. 3 is a side elevation, partly in section, taken substantially on the line 3—3 of Fig. 2 looking in the direction of the arrows.

Fig. 4 is also a side elevation, partly in section, taken substantially on the line 4—4 of Fig. 2 looking in the direction of the arrows.

Fig. 5 is a sectional view, partly in elevation, taken substantially on the line 5—5 of Fig. 3, looking in the direction of the arrows.

Fig. 6 is a sectional view taken substantially on the line 6—6 of Fig. 4, looking in the direction of the arrows.

Fig. 7 is a sectional view taken substantially on the line 7—7 of Fig. 2, looking in the direction of the arrows.

Fig. 8 is a sectional view taken substantially on the line 8—8 of Fig. 5, looking in the direction of the arrows.

Fig. 9 is a sectional view taken substantially on the line 9—9 of Fig. 2, looking downwardly in the direction of the arrows.

Fig. 10 is a top plan view taken substantially on the line 10—10 of Fig. 2.

Fig. 11 is a perspective view of the copyholder in the fully collapsed and folded position.

Fig. 12 is a sectional view taken substantially on the line 12—12 of Fig. 2, looking in the direction of the arrows and showing the manually operable means whereby the copy carrying member may be returned to a first line indicating position.

Fig. 13 is a fragmentary sectional view of a portion of the interconnected sighting bar actuating mechanism.

Fig. 14 is a sectional view of an improved attaching bracket employed to clamp the copyholder to a table or desk.

Fig. 15 is a rear elevational view of the attaching bracket taken substantially on the line 15—15 of Fig. 14, looking in the direction of the arrows.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention claimed herein beyond the requirements of the prior art.

Referring now to Fig. 1, it will be observed that the copyholder comprises a copy holding member 10 detachably connected to spaced right and left supporting elbows 12 and 14. The elbows 12 and 14 are carried by laterally spaced groups of nested right and left telescoping tubes 16 and 18 pivotally mounted in a generally rectangularly shaped housing 20. The vertical position of the copy carrying member 10 may be controlled by an actuating lever 22 projecting from the housing 20 and operably connected to control the vertical movement of the groups of telescoping tubes 16 and 18 by novel motion transmitting mechanism.

The lever 22 is hinged at 24 and is provided with a slide locking mechanism 26 whereby it may be folded across the front of the housing 20 as illustrated in Fig. 11 wherein the copyholder is illustrated in the collapsed and folded position. The housing 20 has spaced supporting feet 28 of suitable resilient material, and a rigidifying arm 30 hingedly connected to the housing 20 by a hinge 32.

A backing shield 34 formed of any suitable material such for example as heavy fabric treated to prevent the flow of light therethrough may be provided to shield the space between the copy carrying member 10 and the housing 20. The shield 34 is provided with reinforced apertures to receive spaced pins 36 carried by the copy carrying member 10 to operably connect the shield to the copy carrying member.

A preferably transparent sighting bar 38 having a reading line 39 is carried by spaced right and left supporting members 40 and 42 projecting from the housing 20. The supporting members 40 and 42 are vertically adjustable to position the sighting bar 38 at any desired vertical elevation above the housing 20 and to position it to engage or lie adjacent the material supported on the copy carrying member 10.

As illustrated in Fig. 2, the groups of telescoping tubes 16 and 18 preferably include rotatable right and left external master tubes 44 and 46 and internal tubes 48 and 50 held against rotation by the elbows 12 and 14 respectively supporting the copy carrying member 10. The external tubes 44 and 46 each has an actuating pin 52 fixed adjacent its upper ends, and each of the internal tubes 48 and 50 has an actuating pin 54 fixed adjacent its lower end.

Duplex actuating members having external and internal tubes 56 and 58 respectively may be interposed between the external master tubes 44 and 46 and the internal tubes 48 and 50 of each group of tubes 16 and 18 respectively. Each of the external tubes 56 of each of the duplex members has a helical groove 60 to receive the actuating pin 52 of each of the external master tubes 44 and 46, and each internal tube 58 of each duplex member has a helical groove 62 to receive the actuating pin 54 of each of the internal non-rotatable tubes 48 and 50.

The helical grooves 60 and 62 of the external and internal tubes 56 and 58 respectively of each of the duplex actuating members are of equal pitch and are preferably staggered with reference to each other 180° at one end. If desired, the tubes 56 and 58 of the duplex members may carry the actuating pins, and the helical grooves may be formed in the external master tubes 44 and 46 and in the internal tubes 48 and 50. It will be apparent that the duplex actuating members may be provided with one actuating pin and one helical groove positioned to cooperate with actuating pins and helical grooves associated with the internal and external tubes.

If a greater length of travel of the copy carrying member is required than can be procured with single duplex actuating members, an additional actuating tube having an actuating pin or a helical groove or one or more duplex actuating members having actuating pins or helical grooves may be provided. Such additional actuating members may be positioned either inside or outside of the illustrated tubes. It will also be apparent that if desired a single group of telescoping actuating members may be provided and the copy carrying member may be guided by telescoping guide rods pivotally mounted in the housing 20.

Means may be provided to control the rotation

of the right and left external master tubes 44 and 46 to cause them to rotate in unison to control the vertical position of the copy carrying member 10. One desirable form of such control means comprises right and left actuating members 66 and 68 operably connected to the external master tubes 44 and 46.

The actuating members 66 and 68 are carried by laterally spaced right and left brackets 70 and 72 pivotally mounted by means of the pivots 71 and 73 on laterally spaced supports 74 and 76 respectively carried by a backbone member 78 of the main frame 80 of the copyholder.

The right and left brackets 70 and 72 have upper and lower flanges 82 and 84 respectively in which the external master tubes 44 and 46 are rotatably journalled. Each of the right and left actuating members 66 and 68 has a radially extending driving flange 86 and 88 adapted to be clamped to the right and left external master tubes 44 and 46 respectively by means of axially extending bushings 90 and threaded plugs 92 (Fig. 5).

Spaced right and left driving disks 94 and 96 are provided to drive the flanges 86 and 88 respectively. The driving disks 94 and 96 are fixed to right and left sleeves 98 concentrically mounted on axially extending bushings 100 interposed between the right and left hand external tubes 44 and 46 and the lower flanges 84 of the right and left brackets 70 and 72.

As illustrated in Figs. 4, 5, 7 and 8, the surfaces of the right and left hand driving disks 94 and 96 adjacent the respective driving flanges 86 and 88 are contoured to provide V-shaped surfaces between the respective disks and flanges to receive a plurality of spaced rollers 102 to rotate the flanges 86 and 88 and the master tubes 44 and 46 when the right and left disks 94 and 96 are rotated in one direction.

Yielding means such for example as a spring 104 concentrically mounted on each of the right and left master tubes 44 and 46 are interposed between each of the disks 94 and 96 and the lower flanges 84 of the right and left hand brackets 70 and 72. The springs 104 urge the disks 94 and 96 towards a predetermined position wherein the pins 106 fixed in the bushings 100 move in horizontally extending slots 109 aligned with angularly inclined slots 108 formed in the sleeves 98, as illustrated in Fig. 7.

The rollers 102 are yieldingly urged towards a driving position in engagement with the right and left hand disks 94 and 96 and the flanges 86 and 88 by springs 110 projecting from the disks 94 and 96 and extending around the edges of sleeves 98 as illustrated in Fig. 8.

Spaced right and left auxiliary driving disks 112 and 114 are provided to hold the right and left flanges 86 and 88 against backward rotation when the driving disks 94 and 96 are being returned to their normal position under the influence of the springs 104 associated with the right and left master tubes 44 and 46 respectively.

The auxiliary disks 112 and 114 are fixed to right and left sleeves 116 surrounding axially extending bushings 118 interposed between the upper flanges 82 of the right and left hand brackets 70 and 72 and the master tubes 44 and 46 (Fig. 5). Spaced rollers 120 interposed between contoured portions of the auxiliary disks 112 and 114 and the right and left hand flanges 86 and 88 produce a wedging force on the flanges 86 and 88 to prevent them from rotating backwardly when the driving disks 94 and 96 are released.

Stop pins 122 carried by the right and left hand bushings 118 project into angularly inclined slots 124 of the sleeves 116 to limit rotational movement of the right and left hand auxiliary disks 112 and 114 in one direction. Yielding means such for example as springs 126 concentrically mounted on the tubes 44 and 46 engage the auxiliary disks 112 and 114 and the right and left hand flanges 82 to yieldingly urge the auxiliary disks towards a predetermined position with the pins 122 engaging the material defining the end of the slots 124 as illustrated in Fig. 7.

Means may be provided to simultaneously rotate the right and left driving disks 94 and 96 to actuate the right and left hand driving flanges 86 and 88 and tubes 44 and 46 to elevate the copy carrying member 10.

One desirable form of such means comprises an actuating rod 130 (Figs. 3 to 9) journalled in the end plates of the main frame member 80. The rod 130 is provided with right and left crank arms 132 and 134 of equal length.

The arms 132 and 134 are operably connected to the right and left driving disks 94 and 96 by right and left links 136 and 138 having hooked end portions projecting into the right and left driving disks 94 and 96 respectively. The links 136 and 138 have stop members 140 positioned to be engaged by the arms 132 and 134 respectively upon predetermined rotation of the rod 130 to rotate the right and left driving disks 94 and 96 in unison.

Means may be provided to release the driving and auxiliary disks to permit the right and left master tubes 44 and 46 to rotate in the opposite direction to lower the copy carrying member 10.

The links 136 and 138 operably connected to the right and left driving disks 94 and 96 are provided with releasing stop members 142 spaced from the actuating stop members 140 and positioned to be engaged by the arms 132 and 134 when the rod 130 is rotated in the opposite or clockwise direction as viewed in Figs. 3 and 7.

The right and left auxiliary holding disks 112 and 114 are connected with the right and left hand arms 132 and 134 of the actuating rod 130 by links 144 and 146 projecting into the auxiliary disks 112 and 114. The links 144 and 146 are provided with releasing stop members 148 positioned to be engaged by the arms 132 and 134 when the actuating rod 130 is rotated in the clockwise direction as viewed in Fig. 7.

Backward movement of the arms 132 and 134 by rotation of the actuating rod 130 in the clockwise direction as viewed in Figs. 3 and 7 is transmitted through the releasing stop members to subject the links 136 and 138 operably connected to the driving disks to tension and also to subject the links 144 and 146 operably connected to the auxiliary disks to tension. The driving disks 94 and 96 are forced by the pins 106 carried by the bushings 100 and sliding in the angularly inclined slots 108 of the sleeves 98 to move axially of the bushings 100 against the resistance of the spring 104 to interrupt the driving connection of the rollers 102 with the right and left hand flanges 86 and 88.

In a similar manner the links 144 and 146 cause backward rotation of the right and left auxiliary disks 112 and 114 and the pins 122 carried by the bushings 118 slide in the angularly inclined slots 124 of the right and left sleeves 116 to move the

auxiliary disks away from the flanges 86 and 88 against the resistance of the spring 126 to interrupt the driving connection of the rollers 120 with the flanges 86 and 88.

The actuating shaft 130 is provided with a downwardly extending arm 150 having an enlarged aperture to receive a rod 152 fixed to the backbone member 78 of the main frame 80. The rod 150 carries a plurality of spaced springs 154 and 156 which exert a force on the arm 150 to yieldingly urge the actuating shaft 130 to return to a substantially predetermined inoperative position.

Manually operable means may be provided to vary the extent of vertical movement of the copy carrying member 10 by movement of the actuating lever 22 to readily accommodate the device for use with copy material having lines spaced at varying distances apart.

One desirable form of such control means comprises an adjustable stop member 160 (Figs. 2, 3 and 9) carried by an arm 161 pivotally mounted on a bracket 162 by a rivet 164. The bracket 162 is provided with a pair of spaced slots 166 adapted to receive spaced pins 168 carried by the end member of the main frame 80. The bracket 162 carries a clamping screw 170 slidably mounted in a slot 172 of the main frame 80 whereby the bracket may be adjustably clamped to the frame to vary the distance between the stop member 160 and the actuating shaft 130.

If the bracket 162 is moved to position the stop member 160 farther from the actuating shaft 130, it will obstruct angular movement of the actuating lever 22 sooner than it will if it is spaced closer to the actuating shaft. The rotational movement of the actuating shaft 130 controlling the vertical position of the copy carrying member 10 can therefore readily be changed by varying the distance between the stop member 160 and the actuating shaft 130 by movement of the bracket 162.

Means may be provided to indicate the extent of vertical movement of the copy carrying member by predetermined movement of the actuating lever 22. One desirable form of such indicating means comprises cooperating scales 174 and 176 carried by the sighting bar 38 (Figs. 1 and 2) and the end of the housing 20 respectively (Fig. 11). The sighting bar 38 may be formed of transparent material or may have a transparent section to carry the scale 174.

The bracket 162 is provided with a lug 178 having a reference line 180 adapted to cooperate with the graduations of the scale 176 of the housing 20 (Figs. 9 and 11) to indicate the vertical movement of the copy carrying member 10 relative to the scale 174 on the sighting bar 38 upon actuation of the lever 22.

To adjust the stop member 160 to control the vertical movement of the copy carrying member 10, the reading line 39 of the sighting bar 38 may be aligned with the bottom of a line of type of material mounted on the copy carrying member 10. One of the graduations of the scale 174 on the sighting bar 38 is aligned with the bottom of the next line of type of the material to be copied (Figs. 1 and 2). This indicates the desired position of the reference line 180 of the bracket 162 relative to the graduations of the scale 176 (Figs. 9 and 11) to permit movement of the copy carrying member 10 a vertical distance corresponding to the vertical distance between the lines of the material to be copied.

Assume for example that when the reading line 39 of the sighting bar 38 is aligned with the bottom of one line of material to be copied, the bottom of the next line of material is in alignment with the horizontal line indicated by the numeral 3 of the scale 174. The bracket 162 should then be positioned so that the reference line 180 of the lug 178 is aligned with the numeral 3 of the scale 176 carried by the housing 20 as illustrated in Fig. 11. The clamping screw 170 should then be tightened to clamp the bracket 162 in a fixed position relative to the end member of the main frame 80. The copy carrying member 10 will then be elevated a distance corresponding with the distance between lines of type or the distance between the ruling line 39 and the graduation indicated by the numeral 3 of the scale 174 each time the lever 22 is actuated.

Means may be provided to permit vertical movement of the copy carrying member 10 corresponding with single, double or triple spacing of the distance indicated by the reference line 180 relative to the graduations of the scale 176.

One illustrative form of suitable spacing control means comprises auxiliary stop members 186 and 188 carried by the arm 161. The arm 161 may be provided with a manually operable actuating lever 190 projecting through an aperture 192 in the front of the housing 20 as illustrated in Fig. 11.

Since the stop members 160, 186 and 188 are carried by the arm 161, their angular relation relative to the lever 22 remains constant regardless of the position of the bracket 162 relative to the actuating shaft 130. The vertical distance between the stop members 160, 186 and 188 is such that in all positions of the bracket 162 the stop member 186 will permit twice the vertical movement of the actuating lever 22 as the stop 160, and the stop member 188 will permit three times the movement of the actuating lever as the stop member 160.

The arm 161 can be moved angularly on the pin 164 to move all of the stop members 160, 186 and 188 out of alignment with the path of travel of the actuating lever 22 to permit unlimited vertical movement of the copy carrying member 10 by actuation of the lever 22.

The housing 20 adjacent the aperture 192 may be provided with a scale 194 to indicate the position of the lever 190 to selectively align one of the stops 160, 186 or 188 with the path of movement of the actuating lever 22 to permit single, double or triple spacing. A reference character is also provided to indicate the position of the lever 190 when none of the stops are in the path of movement of the actuating lever 22 to permit infinite movement of the copy carrying member 10.

Means may be provided to permit vertical adjustment of the sighting bar 38 to suit the convenience of different operators.

The supporting members 40 and 42 for the sighting bar 38 are preferably flexible, and are interconnected in such a manner as to maintain the sighting bar horizontal in any vertical position to which it may be moved.

As more clearly illustrated in Figs. 2, 9 and 13, the supporting members 40 and 42 are formed of closely wound coils of spring wire slidably mounted in parallel tubes 200 and 202 respectively. It will be noted that the tube 202 has a curved section 204 connecting with a tube 206 extending parallel with the tube 200.

The supporting members 40 and 42 are interconnected by a bracket 208 as illustrated in Fig.

13. The side walls of the tubes 200 and 206 are cut away as illustrated at 209 in Fig. 7 whereby the bracket 208 may slide longitudinally of the tubes 200 and 206. This movement of the bracket 208 operates to feed the supporting members 40 and 42 equally through the tubes 200 and 202. The tubes 200 and 202 are aligned with angularly inclined directing nozzles 210 and 212 carried by brackets 214 and 216 respectively. The brackets 214 and 216 are pivotally mounted on the end members of the main frame 80 by pivots 215 and 217 respectively aligned with the center of the tube 200. The angularly inclined directing nozzles 210 and 212 are aligned with apertures 218 and 220 formed in the top of the housing 20.

The upper ends of the supporting members 40 and 42 are provided with angularly extending projections 222 and 224 respectively adapted to receive spring clamping brackets 226 and 228. The spring brackets 226 and 228 engage horizontally extending projections 230 and 232 respectively carried by the sighting bar 38. The spring brackets 226 and 228 yieldingly engage the projections 230 and 232 of the sighting bar 38 to yieldingly hold it in any desired angular position relative to the material clamped to the copy carrying member 10.

The supporting members 40 and 42 may be telescoped into the tubes 200 and 202 to extend transversely within the housing 20 and permit the sighting bar 38 to be lowered to a collapsed position to lie on the top of the housing 20. The spring brackets 226 and 228 permit the sighting bar 38 to rotate on the horizontally extending portions of the projections 222 and 224.

Motion transmitting means may be provided to separate the sighting bar 38 from the material supported on the copy carrying member 10 before the actuating members are released to permit lowering of the copy carrying member 10 to avoid ruffling of the material being copied.

One desirable form of such motion transmitting means is illustrated in Figs. 2, 7 and 9. The actuating shaft 130 is provided with an arm 240 adapted to receive a link 242. The link 242 has a contoured end portion 244 of a radius corresponding with the length of the arm 240 whereby the arm 240 may move freely on the contoured portion of the link when the shaft 130 is actuated in the counterclockwise direction as viewed in Fig. 7 to elevate the copy carrying member 10. The link 242 is provided with a stop member 246 positioned to be engaged by the arm 240 to actuate the link 242 when the shaft 130 is rotated in the clockwise direction as viewed in Fig. 7 to release the actuating members 66 and 68.

The link 242 is operably connected to an arm 248 fixed to the tube 200 in such a manner as to oscillate the tube 200 when the actuating shaft 130 is rotated to release the copy carrying member 10. Oscillation of the tube 200 is transmitted through the tubes 202 and 206 to move the directing nozzles 210 and 212 angularly in the counterclockwise direction about the pivot points 215 and 217 of the brackets 214 and 216 on the main frame member. Angular movement of the directing nozzles 210 and 212 moves the supporting members 40 and 42 angularly in the counterclockwise direction as viewed in Figs. 3 and 7 to separate the sighting bar 38 from the material carried by the copy carrying member 10.

A spring 250 interposed between the arm 248 and the front member 252 of the main frame 80 may be provided to yieldingly urge the supporting members 40 and 42 in the clockwise direction as viewed in Figs. 3 and 7 to yieldingly maintain the sighting bar 38 in engagement with the material supported on the copy carrying member 10. The spring 250 also maintains the link 242 in the forward position illustrated in Fig. 7 wherein it does not interfere with counterclockwise movement of the arm 240 and actuating shaft 130. The aperture in the arm 240 which receives the contoured portion 244 of the link 242 is of sufficient size to prevent binding of the arm on the link due to angular displacement of the link 242 caused by material clamped to the copy carrying member 10.

The sighting bar actuating linkage is so proportioned that the sighting bar 38 is released from the copy material supported on the copy carrying member 10 before the actuating mechanism controlling the vertical position of the copy carrying member is released. The possibility of ruffling the copy material supported on the copy carrying member or causing binding of material between the copy carrying member and the sighting bar is thus eliminated.

The shield 34 which as previously stated may be formed of any suitable material such as heavy fabric may be attached to a roll 260. The roll 260 is supported in brackets 262 and 264 carried by the main frame 80 (Figs. 2 and 9). The roll 260 has an internal spring to exert a force to wind the shield 34 on the roll, and to assist the force of gravity acting on the copy carrying member 10 and telescoping tubes to return the copy carrying member to the retracted position.

Means may be provided to adjustably vary the retracted position of the copy carrying member 10 to permit it to return to a first line position when the actuating mechanisms 66 and 68 are released.

One illustrative form of such control means comprises adjustable stops 270 and 272 carried by the internal tubes 48 and 50 respectively (Figs. 1 to 3). As more clearly illustrated in Fig. 12, the adjustable stops are provided with a spring clip 274 mounted on a pin 276 in such a manner that parallel bars 278 may lie within spaced slots 280 formed in the inner tubes 48 and 50. By actuating manually operable clips 282 the adjustable stops 270 and 272 may be moved to any desired vertical position on the tubes 48 and 50. Each of the adjustable stops 270 and 272 is provided with resilient bushings 284 positioned to engage the upper end of the duplex actuating members of the telescoping tubes 16 and 18. When the actuating lever 22 is manipulated to release the actuating members 66 and 68 the stops 270 and 272 engage the duplex members to prevent the copy carrying member 10 from moving downwardly beyond a predetermined first line indicating position.

The copy carrying member 10 is provided with a pair of oppositely extending lugs 290 and 292 adapted to clampingly engage the elbows 12 and 14 respectively. The copy carrying member 10 is also provided with an upper rolled bead 296 forming horizontally extending tubes 298 adapted to receive the horizontally extending portions of the elbow members 12 and 14 whereby the copy carrying member 10 may be securely mounted on the telescoping tube members 16 and 18 respectively.

Means may be provided to permit clamping of copy material to the copy carrying member 10 at a plurality of spaced points. One desirable form

of such clamping means includes a pair of spaced bails 310 and 312. The bail 310 is pivotally connected to the back of the copy carrying member 10 by means of brackets 314 and 316 riveted thereto (Fig. 10). The bail 312 is pivotally mounted on the copy carrying member by means of brackets 318 and 320 respectively. Each of the bails 310 and 312 is provided with coiled springs 322 and 324 respectively whereby the front portions of the bails are yieldingly urged into engagement with the face of the copy carrying member 10 to releasably clamp material to be copied to the face of the member 10. Spaced actuating means 326 and 328 may be provided to permit separate movement of the bails 310 and 312 to selectively clamp material to the face of the copy carrying member.

Auxiliary bails 330 and 332 (Figs. 1, 2 and 10) may be provided to engage material such for example as a stenographer's notebook where the pages turn over longitudinally to lie adjacent the rear portion of the copy carrying member 10. The bails 330 and 332 are carried by brackets 334 and 336 respectively pivotally mounted on brackets 338 and 340 riveted or otherwise suitably secured to the copy carrying member 10. Yielding means such for example as springs 342 and 344 may be provided to yieldingly urge the auxiliary bails 330 and 332 into engagement with the material to be copied.

It will be noted that the brackets 334 and 336 are pivotally mounted to the brackets 338 and 340 in such a manner that the bails 330 and 332 may be moved to any desired angular position relative to the copy carrying member 10. Manually operable means 346 and 348 may be provided to actuate the bails 330 and 332.

Adjustable right and left clamping brackets 360 and 362 may be provided to clamp the copy carrying member to a table or desk. Referring to Fig. 14, it will be observed that the clamps 360 and 362 have a horizontally extending portion 364 having resilient pads 365 adapted to underlie a surface 366 to be engaged. The clamps 360 and 362 include staggered vertically extending portions 368 and 370 positioned to lie outside and inside respectively of the housing 20. A manually operable handle 372 is provided to move the bracket downwardly against the resistance of a spring 374 carried by a bracket 375 to move the horizontally extending portion 364 and pad 365 into engaging position with the bottom of the surface 366. The bracket 375 is pivoted to the housing 20 by means of a rivet 377 whereby the bracket can move angularly relative to the housing 20.

Referring to Fig. 15, it will be observed that a pair of oppositely extending slots 374 and 376 are provided in the housing 20 to permit movement of the brackets 360 and 362 to an inoperative position as shown in dot and dash lines wherein the portion 364 of each clamping bracket lies within the space between the supporting feet 28 and the bottom of the housing 20.

The operation of this device is as follows:

Assume that the copy holder is in the fully collapsed and folded position illustrated in Fig. 11, and that it is desired to actuate it. The rigidifying arm 30 hingedly mounted to the casing 20 is rotated on the hinge to align it with the end of the casing 20 as illustrated in Fig. 1. The copyholder is then positioned on whatever surface it is desired to attach it to and the manually operable levers 372 are actuated to position the attaching clamps in the position indicated in full lines in Fig. 15. The levers 372 are then depressed to position the horizontal portions 364 and pads 365 to underlie the surface 366 to which it is desired to clamp the copyholder.

The guide arms 291 and 293 engaging the lugs 290 and 292 and extending into the head 296 of the copy carrying member 10 are rotated outwardly to release the copy carrying member.

The copy carrying member 10 may then be removed from the top of the housing 20 and the telescoping tubes 16 and 18 pivoted about their respective angularly inclined pivot points 71 and 73 on the brackets 74 and 76 to move them from the inoperative dotted line position of Fig. 10 to the elevated operative position. The links 136 and 144 provided to actuate the telescoping tubes 16, and the links 138 and 146 which actuate the tubes 18 are twisted relative to each other as more clearly illustrated in Figs. 4, 7, 8 and 9. This twisting of the actuating links permits them to open up or separate as the tubes are moved to the horizontal or inoperative position illustrated in Fig. 10 and to assume the twisted operative position when the tubes are moved to the upright or operative position. The horizontal portions of the elbow members 12 and 14 carried by the telescoping tubes should then be projected into the tubular portion 298 formed at the upper portion of the copy carrying member 10 and the spring clips 290 and 292 of the copy carrying member 10 moved into engaging position with the vertically extending portion of the elbow members 12 and 14. The shield 34 should then be partially withdrawn from the housing 20 and its reinforced apertures placed over the spaced pins 36 of the copy carrying member to secure the shield to the movable copy carrying member 10.

The supporting members 40 and 42 should then be elevated to position the sighting bar 38 at whatever vertical position the particlular operator desires to observe the material being copied. The interconnection of the supporting members induces them to move vertically in unison thereby maintaining the sighting bar 38 horizontal in any elevated position to which it may be moved. The sighting bar 38 may be rotated on the spring clamps 226 and 228 to a vertical position in substantial alignment with the copy carrying member 10 and shield 34.

The actuating bar 22 should then be pivoted about the hinge 24 from the position illustrated in Fig. 11 to the position illustrated in Fig. 1, and the locking mechanism 26 moved to lock the spaced portions of the actuating member 22 as illustrated in Figs. 1 and 3.

If sheet material is to be copied, the manually operable means 326 and 328 (Fig. 10) may be actuated to pivot the spaced bails 310 and 312 about their respective brackets whereby the material to be copied may be projected under the forward portions of the bails and yieldingly engaged when the bails are released. It will be noted that the bails 310 and 312 may be actuated separately whereby material to be copied may be clamped by one of the bails to permit adjustment of the material relative to the other bail. Greater flexibility of control of the material to be copied is thus provided.

If the material to be copied is in the form of an open-ended notebook such for example as a shorthand book, the cover or portion of the notebook to be folded back is passed under the bail 310, and the book is held by the bail 310. In order to prevent the flexible pages from falling back in front of the work being copied the bail

330 may be rotated on its pivoted bracket 334 to engage the folded pages from the front and slightly above the bail 310 to yieldingly maintain them out of the line of vision with respect to the material being copied. The bails 330 and 332 being pivoted permit of considerable flexibility in controlling the position of various types of material being copied. If desired, they may be used as separator or indexing markers in connection with the material being copied.

If the material to be copied is in the form of an open-ended notebook which is too large to be engaged by the bail 310, the actuating members 346 and 348 may be manually moved downwardly to elevate the bails 330 and 332 and the notebook in the open position may be laid over the top of the copy carrying member 10. The bails 330 and 332 may then be released to yieldingly engage the notebook or other material to be copied to prevent displacement thereof.

The adjustable stop members 270 and 272 should be adjusted on the right and left tubes 48 and 50 to position the copy carrying member 10 at a desired elevation or first line indicating position relative to the sighting bar 38.

The copy carrying member 10 may then be elevated by partial strokes of the actuating member 22 to position the reading line 39 of the sighting bar 38 adjacent the bottom of one of the lines of material to be copied. The horizontal lines of the scale 174 carried by the transparent sight bar 38 should be observed to determine which of the horizontal lines of the scale lies adjacent the bottom of the next line to be copied and the numeral opposite such line noted. The clamping nut 170 (Figs. 3 and 11) should then be loosened and the bracket 162 moved forwardly or backwardly relatively to the end of the housing 20 to align the reference line 180 of the lug 178 with the numeral of the scale 176 corresponding with the numeral referred to above of the scale 174. The clamping screw nut 170 should then be tightened to clamp the bracket 162 to the end member of the frame 80.

If single spaced lines of the material to be copied are desired, the manually operable member 190 is moved angularly toward the left as viewed in Figs. 2 and 11 to position the stop member 160 of the arm 161 in the path of movement of the actuating member 22. If double spaced lines are desired, the arm 161 should be moved outwardly towards the right to position the stop 186 in alignment with the actuating member 22, and if triple spaced lines are desired, the stop member 188 should be positioned in alignment with the actuating member 122. If unlimited movement of the copy carrying member is desired, the arm 161 is rotated on the pivot 164 to the extreme right hand position to move all of the stops out of alignment with the actuating member 22.

Downward movement of the actuating member 22 oscillates the actuating shaft 130 from the neutral position illustrated in Figs. 3, 4 and 7. The shaft 130 is operably connected by means of the arms 132 and 134 and links 136 and 138 with the actuating disks 94 and 96. Oscillation of the shaft 130 in the counterclockwise direction as viewed in Figs. 3, 4 and 7 rotates the right and left actuating disks 94 and 96 in the clockwise direction as viewed in Fig. 8.

Movement of the actuating disks 94 and 96 is transmitted through the spaced rollers 102 to rotate the flanges 86 and 88 fixed to the outer master tubes 44 and 46 respectively. Rotation of the tubes 44 and 46 is transmitted through the duplex actuating member and actuating pins 54 to elevate the internal tubes 48 and 50 and the copy carrying member 10. When the actuating lever is released, the springs 104 and 154 return the actuating disks 94 and 96 and the actuating shaft 130 and the lever 22 to their inoperative positions.

When the actuating disks 94 and 96 release the flanges 86 and 88 to return to their inoperative positions, the auxiliary disks 112 and 114 yieldingly urged by their springs 126, position their spaced rollers 120 in engagement with the flanges 86 and 88 to prevent backward rotation of the flanges and the master tubes 44 and 46.

When the external master tubes 44 and 46 have thus been actuated a sufficient number of times to elevate the internal tubes 48 and 50 the full length of the internal tubes 58, the actuating pin 52 carried by the external tubes 44 and 46 engaging the helical slot 60 of the tubes 56 of the duplex actuating members elevate the tubes 56 and 58 to further elevate the copy carrying member 10.

When the copy carrying member 10 has been elevated to align the bottom of the material being copied with the sighting bar 38, the copy carrying member 10 may be released to return the material being copied to the first line indicating position. To actuate the releasing mechanism the operator elevates the actuating handle 22 to oscillate the actuating shaft 130 in the clockwise direction as viewed in Figs. 3, 4 and 7. This movement of the actuating shaft 130 is transmitted through the stop members 142 of the links 136 and 138 operably connected to the actuating disks 94 and 96, and through the stop members 148 carried by the links 144 and 146 operably connected to the auxiliary disks 112 and 114. This movement of the actuating and auxiliary disks rotates them in the counterclockwise direction as viewed in Figs. 8 and 9. Referring to Figs. 5 and 7, it will be noted that the pins 106 and 122 carried by the bushings 100 and 118 slide within the slots 108 and 124 of the sleeves 98 and 116 to separate the actuating and auxiliary disks from the actuating flanges 86 and 88 respectively.

The force of gravity acting on the copy carrying member 10 and the elevated tubes, together with the weight of the material being copied and the force exerted by the spring in the roll 260 carrying the shield 34, moves the telescoping tubes toward the collapsed position thereby returning the copy carrying member to the first line indicating position. When the lever 22 is released the spring 156 returns the shaft 130 to the neutral or inoperative position.

As the actuating lever 22 is elevated to release the copy carrying member to permit it to move to the retracted position, the link 242 actuated by the arm 240 oscillates the arm 248 fixed to the tube 200 in the counterclockwise direction as viewed in Fig. 7. Oscillation of the tube 200 operates through the associated tubes 202 and 206 to pivot the directing nozzles 210 and 212 carried by the brackets 214 and 216 about the pivots 215 and 217 respectively aligned with the center of the tube 200. This movement of the directing nozzles is transmitted through the supporting members 40 and 42 to separate the sighting bar 38 from the material supported on the copy carrying member 10. The possibility of ruffling the pages of the material being carried is thereby avoided.

The copyholder may be moved to the collapsed position by merely reversing the steps enumerated to move it from the collapsed to the operative position.

I claim:

1. A copyholder comprising sighting bar and copyholding members movable relatively one to the other, means for supporting and moving the movable member comprising rotatable telescoping tubes, and motion transmitting means for rotating the telescoping tubes.

2. In a copyholder, a sighting bar, a copy carrying member, motion transmitting means comprising nested rotatable telescoping tubes for supporting and moving the copy carrying member relative to the sighting bar, and manually operable means for rotating the rotatable tubes.

3. A copyholder comprising a generally horizontally extending sighting bar, a copy carrying member movable vertically relative to the sighting bar, transversely spaced groups of telescoping tubes supporting the copy carrying member, and motion transmitting means for actuating said groups of telescoping tubes in unison to move the copy carrying member.

4. A copyholder comprising a copy carrying member movable vertically from a retracted position, means to elevate the copy carrying member comprising transversely spaced groups of nested telescoping tubes including rotatable and non-rotatable tubes operably connected to the copy carrying member, cooperating motion transmitting means between said tubes operable by rotative movement of the rotatable tubes, means including rotatable radially extending flanges to actuate the rotatable tubes, an actuating shaft rotatable in opposite directions from a neutral position, means engaging said flanges and operable by rotation of the shaft in one direction from the neutral position to rotate said flanges in unison to elevate the copy carrying member, means engaging said flanges and operable upon release of said shaft to hold the copy carrying member against downward movement, and means operable upon reverse rotation of said shaft from the neutral position to release the flanges to enable the copy carrying member to return to the retracted position.

5. In a copyholder, a support, a copy carrying member, motion transmitting means comprising telescoping rotatable and non-rotatable tubes interposed between the support and the copy carrying member whereby the copy carrying member may be moved vertically from a retracted position relative to the support upon rotation of a rotatable tube, a flange operably connected to said rotatable tube, an actuating shaft rotatable in opposite directions from a neutral position, actuating and holding disks spaced on opposite sides of the flange, driving means between said disks and the flange, yielding means urging the disks towards the flange, connecting means between the actuating disk and shaft to rotate the flange and the rotatable tube upon rotation of the shaft in one direction from the neutral position to move the copy carrying member vertically relative to the support, and connecting means between said actuating and holding disks and the shaft to move said disks axially in opposite directions relative to the flange upon reverse rotation of the shaft from the neutral position to release the flange to enable the rotatable tube to rotate in the opposite direction to return the copy carrying member to the retracted position.

6. In a copyholder, a housing, a sighting bar, transversely spaced vertically adjustable interconnected flexible members projecting from the housing for supporting the sighting bar substantially horizontally in any vertical position to which it is moved relative to the housing.

7. In a copyholder, a housing, a sighting bar, a pair of vertically movable spaced flexible supports for the sighting bar, and motion transmitting means interconnecting said supports to induce the sighting bar to maintain a substantially horizontal position regardless of its vertical elevation relative to the housing.

8. In a copyholder, a housing, a sighting bar, means to support the sighting bar above the housing comprising spaced flexible supports projecting from the housing, guiding means for the flexible supports extending longitudinally in the housing, and means associated with the guiding means and interconnecting the flexible supports to induce the flexible supports to move in unison relative to the housing to maintain the sighting bar substantially horizontal in any vertical position to which it is moved relative to the housing.

9. In a copyholder, a vertically movable copy carrying member, a sighting bar positioned to lie adjacent the copy carrying member, motion transmitting means to elevate the copy carrying member relative to the sighting bar and to release it to return to a retracted position relative to the sighting bar, and connecting means between said motion transmitting means and sighting bar to space the sighting bar from the copy carrying member when the copy carrying member is released to return to said retracted position.

10. A copyholder comprising a housing, a copy carrying member movable vertically relative to the housing, motion transmitting means controlling the vertical movement of the copy carrying member in opposite directions, a sighting bar, means to support the sighting bar adjacent the copy carrying member, and connecting means between said motion transmitting means and the supporting means for the sighting bar to separate the sighting bar from the copy carrying member when the motion transmitting means is actuated to permit a lowering of the copy carrying member relative to the housing.

11. A copyholder comprising a housing having a frame, a vertically movable copy carrying member, motion transmitting means to intermittently elevate the copy carrying member relative to the housing and to release it to return to a retracted position, a sighting bar, means to support the sighting bar adjacent the copy carrying member comprising spaced supports pivotally mounted on the frame and projecting from the housing, and connecting means between the pivotal supports and said motion transmitting means to move the supports angularly to space the sighting bar from the copy carrying member when the motion transmitting means is actuated to release the copy carrying member to return to said retracted position.

12. A copyholder comprising a vertically movable copy carrying member, motion transmitting means comprising nested tubes for supporting and intermittently elevating the copy carrying member, a shaft controlling the motion transmitting means, a lever operably connected to the shaft, and adjustable stop means controlling the movement of the lever to vary the intermittent elevation of the copy carrying member.

13. A copyholder having a frame member, a

copy carrying member, means for intermittently elevating the copy carrying member relative to the frame member a line space at a time, motion transmitting means comprising a shaft for actuating said elevating means, an actuating lever operably connected to the shaft, a bracket adjustably mounted on the frame and movable towards and away from the shaft, stop means including an arm pivotally mounted on the bracket, a plurality of substantially equally spaced stop members carried by the arm and selectively movable into alignment with the actuating lever, manually operable means controlling the position of the bracket on the frame to vary the distance between the stop means and the shaft to vary the intermittent movement of the copy carrying member upon actuation of the actuating lever to correspond with variously spaced lines, and manually operable means controlling the angular movement of said arm to successively align different of said stop members with the actuating lever to vary the intermittent movement of the copy carrying member upon actuation of said lever to provide movement of the copy carrying member corresponding with single, double or triple spacing of lines.

14. In a copyholder, a copy carrying member, a generally horizontally extending sighting bar having a transparent portion including a reading line and vertically spaced graduations to indicate the vertical spacing of lines of material supported on the copy carrying member, motion transmitting means including a manually operable lever and a rotatable member to intermittently move the copy carrying member vertically relative to the sighting bar, manually adjustable stop means movable relative to said rotatable member to vary the vertical movement of the copy carrying member upon actuation of the manually operable lever, and spaced graduations associated with the adjustable stop means and cooperating with the spaced graduations on the sighting bar to indicate the extent of vertical movement of the copy carrying member relative to the sighting bar.

15. A copyholder comprising a copy carrying member, means including telescoping tubes for supporting and intermittently elevating the copy holding member, motion transmitting means for releasing the copy holding member for return movement, and manually operable adjustable stop means associated with the telescoping tubes to arrest downward movement of the copy carrying member at a first line indicating position.

16. In a copyholder, a vertically movable copy carrying member, motion transmitting means for intermittently elevating the copy holding member, means for releasing the copy holding member for return movement, a sighting bar, means to support the sighting bar adjacent the copy carrying member, connecting means between the releasing means for the copy carrying member and the supporting means for the sighting bar to move the sighting bar away from the copy carrying member when said releasing means is actuated, and manually operable adjustable stop means associated with said motion transmitting means to arrest return movement of the copy carrying member at a first line indicating position relative to the sighting bar.

17. A collapsible copyholder comprising a frame, a housing carried by the frame, a copy carrying member, spaced columns supporting the copy carrying member, hinge connecting means between the frame and said spaced columns whereby the columns may be folded from a substantially vertical operative position to a substantially horizontal inoperative position within the housing, a sighting bar, and spaced supports for the sighting bar comprising flexible shafts movable from substantially vertical operative positions to substantially horizontal inoperative positions within the housing.

18. A copyholder comprising a frame, a copy carrying member, spaced supports for the copy carrying member, detachable connecting means between the copy carrying member and the supports, angularly inclined hinge connecting means between the supports and frame whereby the supports may pivot about the hinge connections to a collapsed inoperative position, a sighting bar, spaced supports for the sighting bar operably connected to the frame, and means associated with the sighting bar supports and frame whereby said supports may occupy an inoperative collapsed position.

19. A copyholder comprising members movable vertically relative to each other, telescoping tubes supporting one of said members, motion transmitting means including relatively movable actuating and holding disks to move one of said members vertically relative to the other, and a lever movable in opposite directions for controlling said disks.

20. In a copyholder, a sighting bar, a copy carrying member, means controlling vertical movement of the copy carrying member in opposite directions relative to the sighting bar, and means responsive to downward movement of the copy carrying member to space the sighting bar from the copy carrying member.

21. A copyholder comprising a sighting bar, a copy carrying member movable relative to the sighting bar, motion transmitting means to elevate the copy carrying member relative to the sighting bar, means to release the copy carrying member to move downwardly relative to the sighting bar, and means operable upon actuation of the last named means to space the sighting bar from the copy carrying member.

22. A collapsible copyholder comprising a housing, a copy-carrying member, spaced supports for the copy-carrying member, hinged connecting means between the supports and the housing whereby the supports may be moved between upright operative and collapsed inoperative positions, detachable connecting means between the copy-carrying member and the spaced supports, a flexible light shield interposed between the copy-carrying member and the housing, detachable connecting means between the light shield and the copy-carrying member, a reel for the light shield rotatably mounted in the housing, a sighting bar, and connecting means between the sighting bar and the housing whereby the sighting bar may be adjusted vertically relative to the housing and may occupy an inoperative collapsed position relative to the housing.

23. In a copyholder, a frame, relatively-movable copy-carrying and sighting bar members, motion-transmitting means to intermittently move one of said members relative to the other, an angularly movable lever for actuating the motion-transmitting means, stop-carrying means comprising a bracket associated with the frame and movable longitudinally of the lever to vary the angular movement of the lever to change the movement of one of said members relative to the other to correspond with the vertical spacing between lines of copy material carried by the copy-

carrying member, clamping means to lock the bracket against movement longitudinally relative to the lever, and means pivotally mounted on the bracket and having a plurality of selectively-operable stop segments adapted to be selectively positioned in the path of movement of the angularly-movable actuating lever to permit moving the movable member a distance corresponding with the spacing between a plurality of lines of the copy material.

24. In a copyholder having relatively movable copy-carrying and sighting-bar members, a scale having vertically-spaced graduations carried by the sighting-bar member to indicate the vertical spacing between lines of copy material carried by the copy-carrying member, a frame, motion-transmitting means to intermittently move one of said members relative to the other, an angularly-movable lever for actuating the motion-transmitting means, stop-carrying means comprising a bracket associated with the frame and movable longitudinally of the lever to vary the angular movement of the lever to change the extent of movement of one of said members relative to the other, a scale having spaced graduations and a pointer associated with the frame and bracket to indicate the extent of movement of one of said members relative to the other, the graduations of the last-named scale corresponding with the vertically-spaced graduations of the scale carried by the sighting bar, and clamping means to lock the bracket against movement longitudinally relative to the actuating lever.

25. In a copyholder having relatively movable copy-carrying and sighting bar members, a scale having vertically-spaced graduations carried by the sighting bar member to indicate the vertical spacing between lines of copy material carried by the copy-carrying member, a frame, motion-transmitting means to intermittently move one of said members relative to the other, stop means to vary the movement of the motion-transmitting means to change the extent of movement of one of said members relative to the other, and a scale having spaced graduations and a pointer associated with the frame and stop means to indicate the extent of movement of one of said members relative to the other, the graduations of the last-named scale corresponding with the vertically-spaced graduations of the scale carried by the sighting bar.

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