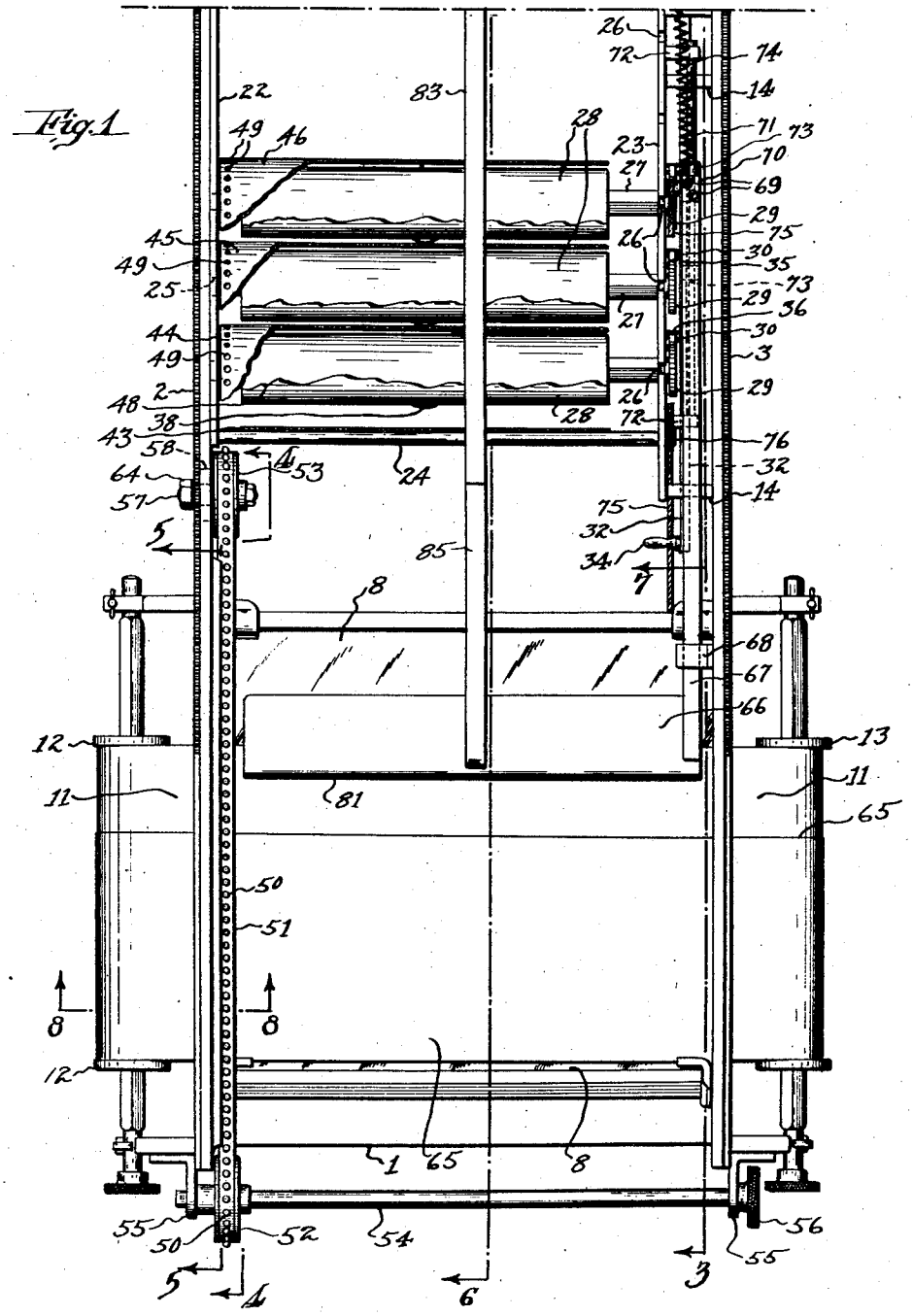
Nov. 12, 1935. E. J. NICHOLS 2,020,734

WRITING MACHINE

Filed Oct. 12, 1934 6 Sheets-Sheet 1

Fig. 1



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WRITING MACHINE

Filed Oct. 12, 1934 6 Sheets-Sheet 2

Fig. 1a

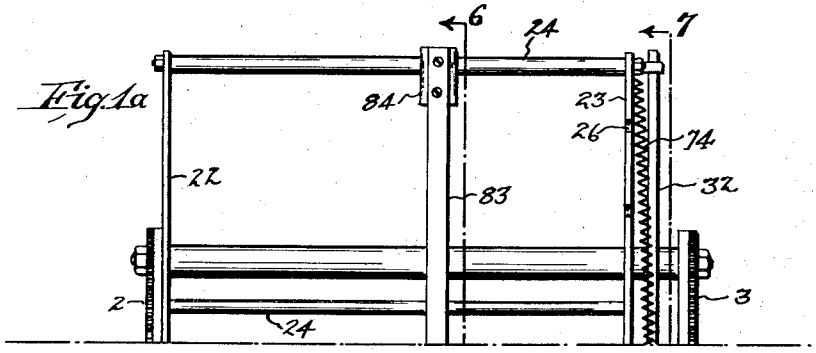
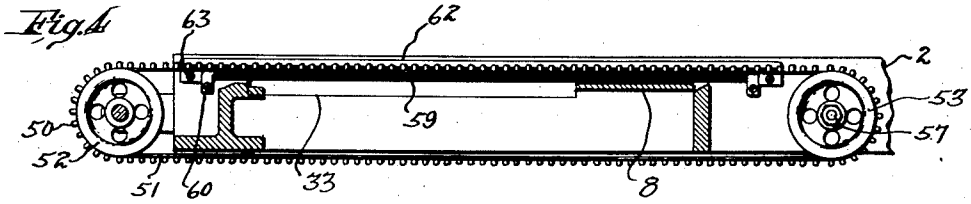


Fig. 4



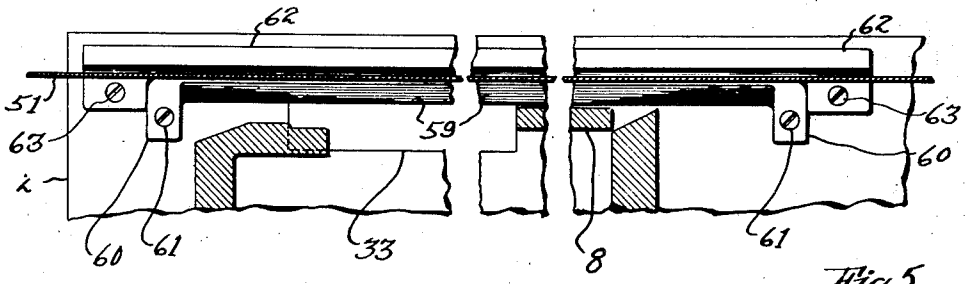


Fig. 5

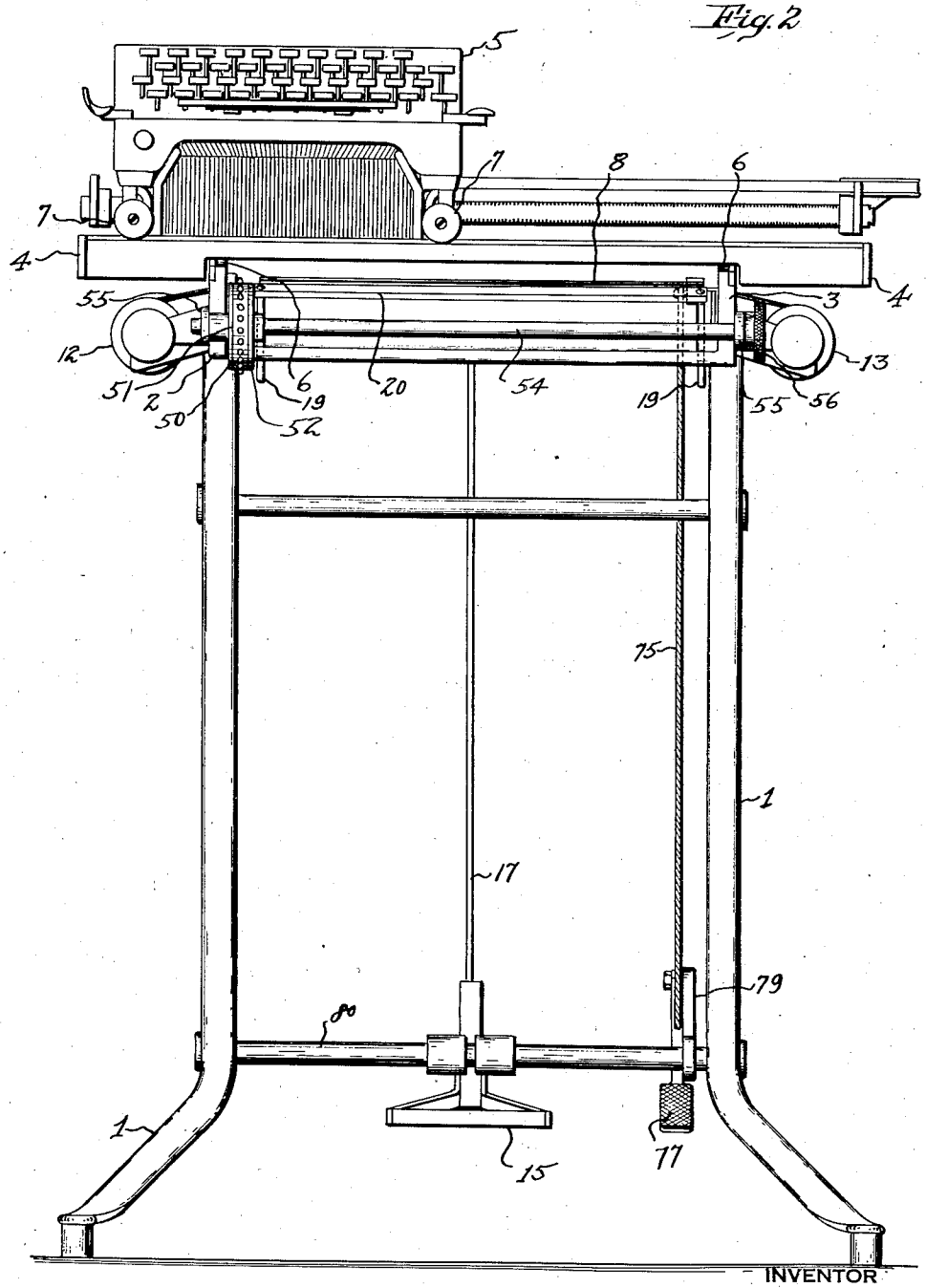
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WRITING MACHINE

Filed Oct. 12, 1934 6 Sheets-Sheet 3

Fig. 2



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WRITING MACHINE

Filed Oct. 12, 1934 6 Sheets-Sheet 4

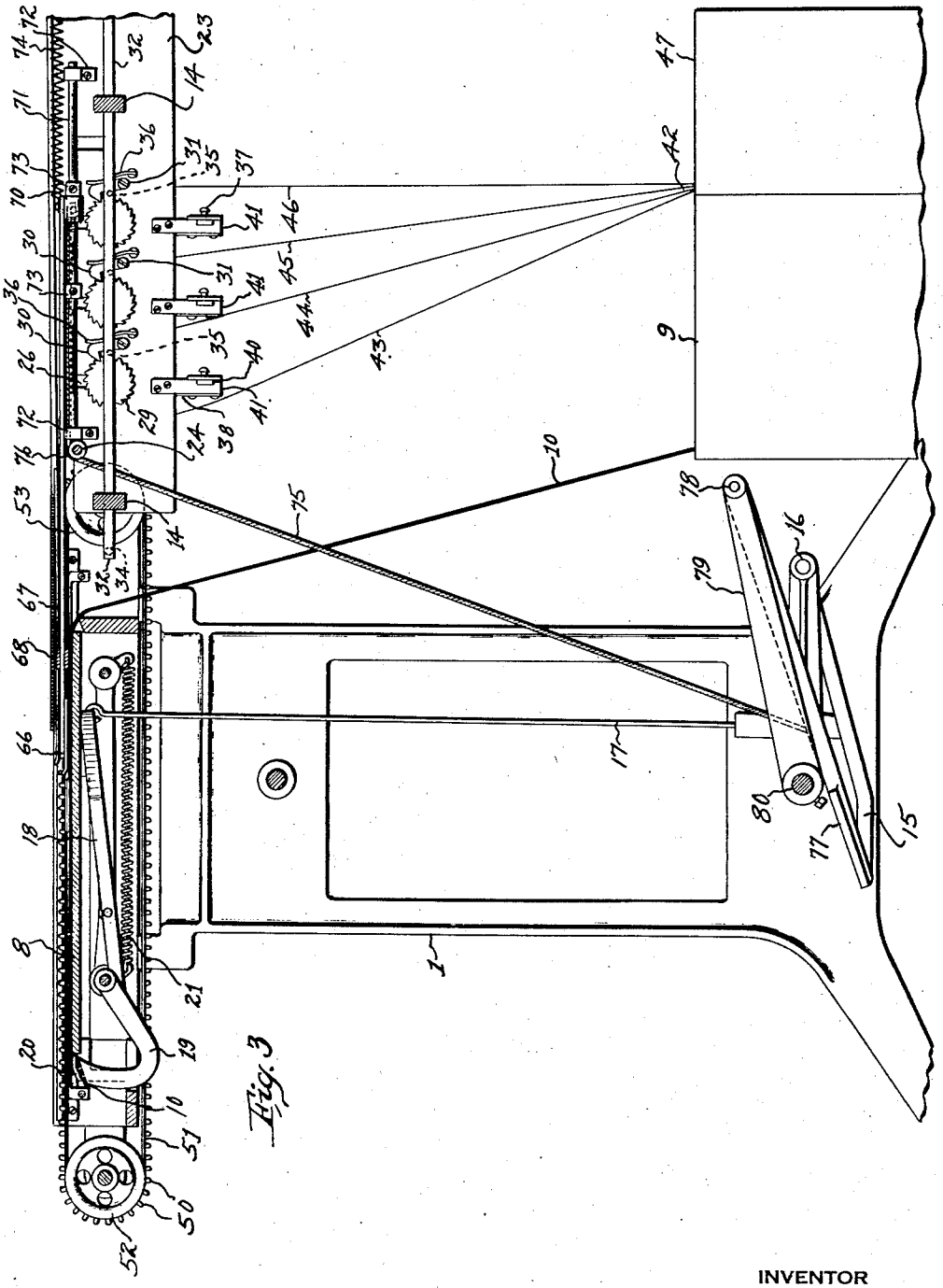


Fig. 3

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WRITING MACHINE

Filed Oct. 12, 1934 6 Sheets-Sheet 5

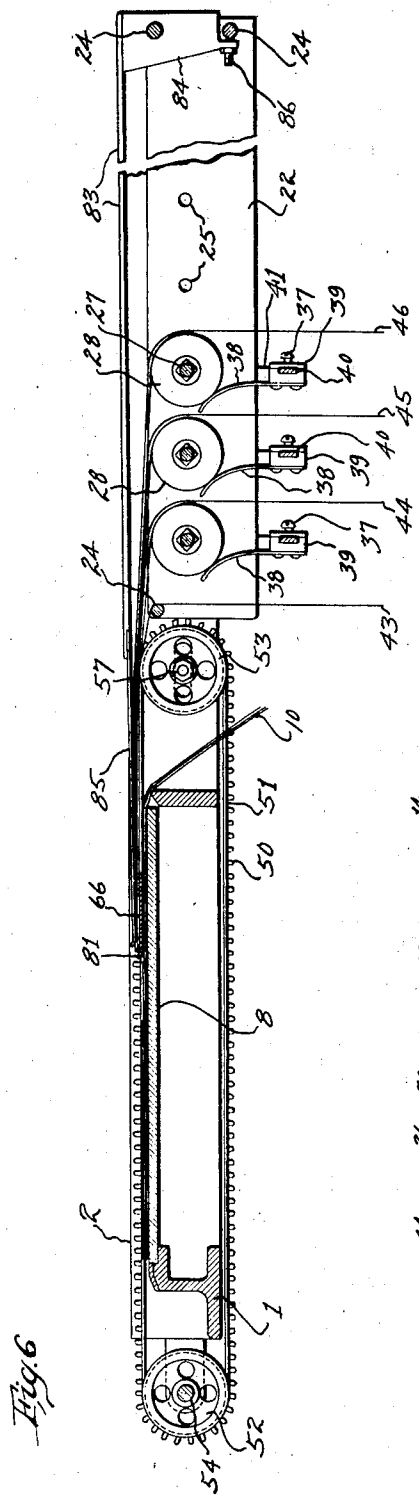


Fig. 6

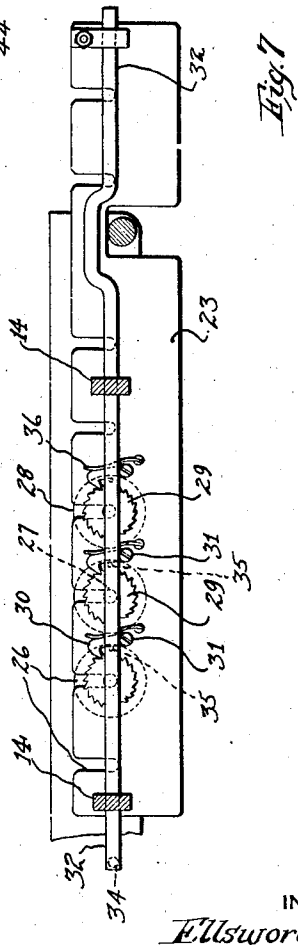


Fig. 7

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WRITING MACHINE

Filed Oct. 12, 1934 6 Sheets-Sheet 6

Fig. 8

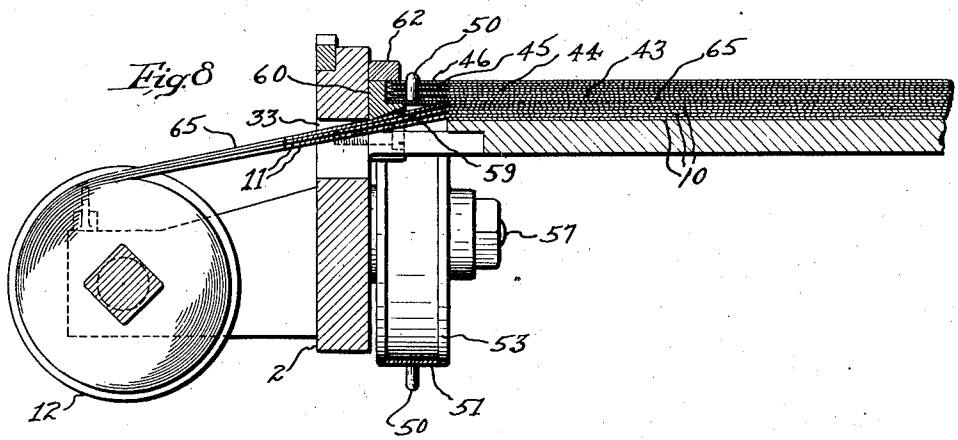
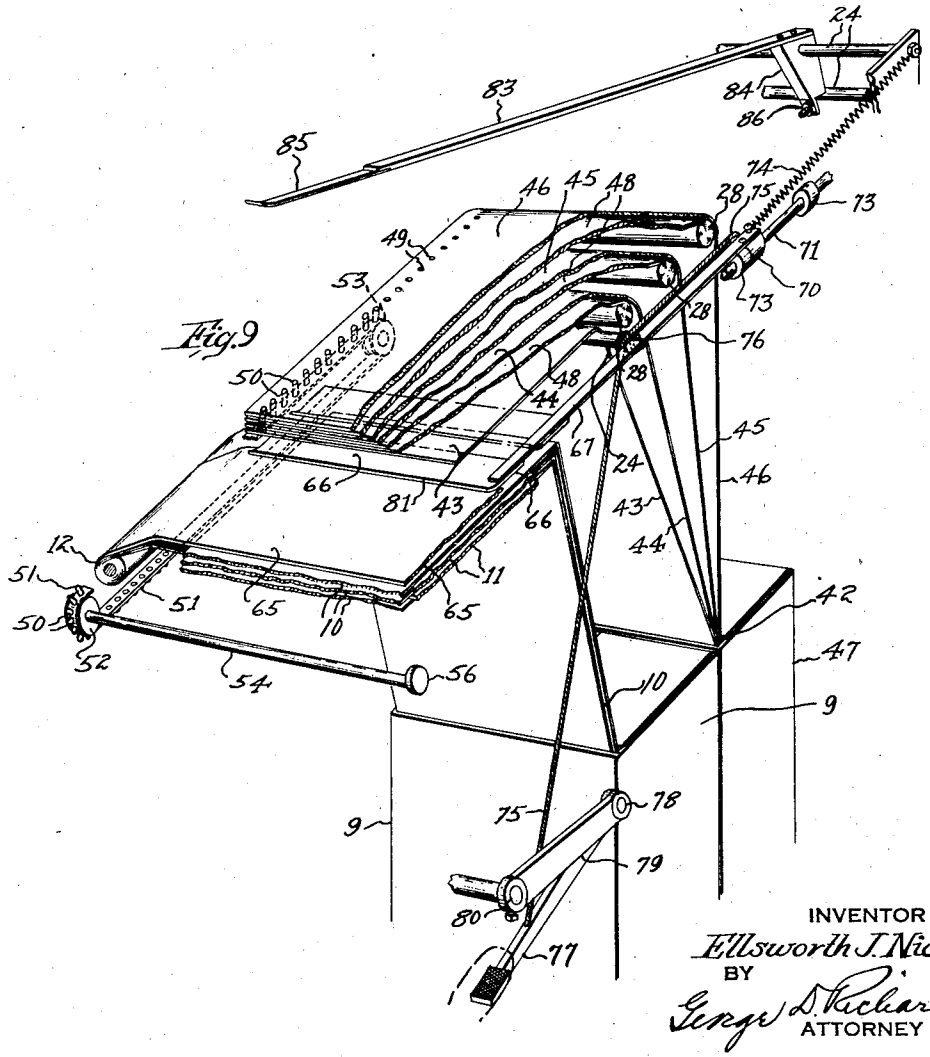


Fig. 9



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Patented Nov. 12, 1935 2,020,734

UNITED STATES PATENT OFFICE

2,020,734

WRITING MACHINE

Ellsworth J. Nichols, Newark, N. J., assignor to New Jersey Optical Company, Newark, N. J., a corporation of New Jersey

Application October 12, 1934, Serial No. 748,002

8 Claims. (Cl. 197—133)

This invention relates, generally, to writing machines, and the invention has reference more particularly to improvements in typewriting machines employing flat writing platens.

Machines of this character as heretofore constructed are capable of writing or operating upon but a single set of continuous forms or sheets at a time and hence, whenever it is desired to typewrite common or partially common subject matter on two different sets of continuous forms, it has been necessary to typewrite the forms separately, i. e. one after the other.

The principal object of the present invention is to provide a novel improved writing machine that is capable of handling or operating upon two sets of continuous forms simultaneously, thereby substantially cutting in half the time ordinarily required to typewrite two sets of forms where the typewritten matter written on both of the sets of forms is the same or partially the same.

Another object of the present invention lies in the provision of a novel writing machine of the above character having continuous tape means for feeding the additional or second set of continuous forms operated upon, together with means for protecting the top sheet of carbon paper used in connection with the first set of forms from the abrading action of the second set of forms passing thereover.

Still another object of the present invention is to provide a novel writing machine of the above character having snubbing means for regulating the feed of carbon paper from the additional carbon rolls used in connection with the second set of forms, and also having means for preventing the jamming or crowding of the second set of forms and its interleaved carbon paper in the typewriter proper when this second set of forms is moved back to obtain access to the first set of forms.

Other objects of this invention, not at this time more particularly enumerated, will be clearly understood from the following detailed description of the same.

The invention is clearly illustrated in the accompanying drawings, in which:

Fig. 1 is a plan view, with some parts broken away or omitted, of the novel improved writing machine of this invention.

Fig. 1*a* is a plan view of a portion of the machine broken away in Fig. 1.

Fig. 2 is a view in front elevation of the novel machine of this invention.

Fig. 3 is a side view with parts broken away taken along line 3 of Fig. 1 looking in the direction of the arrow.

Fig. 4 is a sectional view taken along line 4—4 of Fig. 1 looking in the direction of the arrows.

Fig. 5 is an enlarged sectional view with parts broken away taken along line 5—5 of Fig. 1 looking in the direction of the arrows.

Fig. 6 is a part sectional view taken along line 6—6 of Figs. 1 and 1*a* looking in the direction of the arrows.

Fig. 7 is a fragmentary sectional view taken along line 7—7 of Figs. 1 and 1*a* looking in the direction of the arrows.

Fig. 8 is an enlarged fragmentary sectional view taken along line 8—8 of Fig. 1 looking in the direction of the arrows, and

Fig. 9 is a schematic perspective view of the machine with parts broken away and illustrates the operation of the same.

Similar characters of reference are employed in said views to indicate corresponding parts.

Referring now to the said drawings, the reference numeral 1 designates the frame of the writing machine having horizontal side rails 2 and 3 at its top which rails extend from the front to the rear of the machine for supporting a movable rectangular carriage frame 4 that carries the typewriter 5 thereon. Rollers 6 provided on carriage frame 4 rest on the side rails 2 and 3 and enable the carriage frame 4 to be moved forwardly or rearwardly over rails 2 and 3 while rollers 7 provided on the typewriter 5 enable the latter to move transversely of carriage frame 4. By combined movements of carriage frame 4 over rails 2 and 3 and of typewriter 5 over carriage frame 4, this typewriter may be caused to write on any portion of the flat writing platen 8 carried by frame 1.

One set of continuous forms 10, contained within a box 9 (see Figs. 3 and 9) extends upwardly to the rear edge of platen 8 and from thence forwardly along the upper surface of this platen. Transversely extending carbon sheets 11 (see also Fig. 8) supplied from a carbon roll 12 mounted at one side of the frame 1 feed through a slot 33 provided in side rail 2 and are interleaved with the sheets of form 10 and are rewound upon another roll 13 after use, the said roll 13 being positioned at the opposite side of frame 1. The set of forms 10 is illustrated as consisting of three continuous form sheets (see Fig. 9) though a greater or lesser number of these form sheets may be used. Two of the carbon sheets 11 are interleaved with the three form sheets comprising form set 10.

A transverse clamp bar 20 is adapted to clamp the forward free end of form set 10 against the forward end of platen 8. A foot pedal 15 is pivoted at 16 and, when depressed, operates through link 17 and lever system 18—19 to actuate the transverse clamp bar 20 to released position, thereby releasing the form set 10. A tension spring 21 normally acts to hold the clamp bar 20 in applied condition.

The machine as thus far described is old and

well known and would appear to require no further description. According to the present invention, a substantially rectangular carbon roll frame consisting of side bars 22 and 23 and cross-bars 24 is fixed between the side rails 2 and 3 at the rear of the machine, brackets 14 being employed to support side bar 23 upon, though in spaced relation from, side rail 3. The side bar 22 is provided with a plurality of mutually spaced bearing apertures 25 and the side bar 23 is provided with upwardly opening bearing slots 26 for turnably receiving the end portions of carbon roll shafts 27 that carry carbon rolls 28. Three carbon rolls 28 are shown as thusly supported in the drawings, although a greater or lesser number of such rolls may be used. The right hand ends of carbon roll shafts 27, as seen in Fig. 1, project through the bearing slots 26 and have ratchet wheels 29 fixed thereon.

Ratchet wheels 29 are normally engaged by spring pressed pawls 30 (see also Fig. 7) that are pivoted as upon screws 31 threaded into side bar 23. A push rod 32 is mounted for forward and rearward sliding movement in slide bearing apertures provided in brackets 14, the said push rod having an operating handle 34. Push rod 32 carries pins 35 for engaging the pawls 30. By pushing rearwardly upon handle 34, the push rod 32 acting through pins 35 serves to overcome the tension of the pawl springs 36, thereby disengaging pawls 30 from the teeth of ratchet wheels 29 and permitting the carbon roll shafts 27 to be turned as when drawing or pulling carbon paper off of the same. Any one of the carbon rolls 28 may be removed from the carbon roll frame by pushing handle 34 rearwardly and then lifting the right hand end of its shaft 27 (see Fig. 7) out of bearing slot 26, thereby causing the left hand end of the shaft 27 to disengage its bearing aperture 25 in side bar 22. Thus, any desired number of the carbon rolls 28 may be removed from or inserted into the carbon roll frame at will.

In order to keep the carbon paper forming rolls 28 from unwinding or becoming loose on these rolls, which would result in improper feeding of the carbon paper and also cause wrinkling, binding and tearing of the same in use, leaf springs 38 are provided, which springs have their lower end portions fixed to spring blocks 39 and are disposed so that their upper end portions bear upon the carbon rolls as shown in Fig. 6. Spring blocks 39 are slidably adjustable along transverse bars 40 that have their ends fixedly carried by brackets 41 depending from side bars 22 and 23. By loosening screws 37 the transverse position of the spring blocks 39 may be varied to suit the positions of the carbon rolls on the carbon roll shafts 27.

A second set of continuous forms 42, illustrated as consisting of four continuous form sheets 43, 44, 45 and 46, is contained within a box 47 and extends upwardly therefrom. The first or front form sheet 43 passes over a cross-bar 24 and from thence forwardly over the uppermost form sheet of the continuous form set 10 (see Fig. 9). The second form sheet 44 passes over the first or forward carbon roll 28 and from thence over the form sheet 43, the carbon paper 48 from the forward carbon roll being interleaved between form sheets 43 and 44. The third form sheet 45 passes over the second carbon roll 28 and from thence over the second form sheet 44, the carbon paper 48 from the second carbon roll being interleaved between form sheets 44 and 45. Likewise the fourth form sheet 46 passes over the third or rear carbon roll 28 and from thence over the third form sheet 45, the carbon paper 48 from the third carbon roll being interleaved between form sheets 45 and 46.

All of the form sheets 43 to 46 comprising the second set of continuous forms 42 are provided adjacent one of their side edges with a series of equally spaced circular apertures 49, the successive apertures 49, of the several sheets respectively registering with one another. Apertures 49 are arranged in longitudinal alignment with, and are adapted to be engaged by, a series of equally spaced pins or projections 50 carried by an endless metal tape or belt 51, that passes around sheaves 52 and 53. Sheave 52 is fixed upon a transverse shaft 54 that extends across the front of the machine and is turnably supported in bearings provided in brackets 55 attached to the machine frame. A knob 56 is fixed on one end of shaft 54, and by turning this knob, sheave 52 is rotated, causing tape 51 to move so that pins 50, by engaging in apertures 49, cause the second set of continuous forms to move either forwardly or rearwardly over the first set of forms 10, depending on the direction of turning of knob 56. The sheave 53 is shown carried by a shaft 57 that extends through a slot 58 in side rail 2. By loosening a nut 64 on shaft 57, the tension of tape 51 may be adjusted.

The upper run of the endless tape or belt 51 is supported intermediate the sheaves 52 and 53 by a ledge 59 (see Figs. 4, 5 and 8) projecting from a bar 60 that extends along the inner surface of side rail 2 and is secured to this rail as by screws 61. Another bar 62 overlies the upper run of the endless tape 51 and extends along the inner surface of side rail 2, this latter bar being secured to this rail 2 as by screws 63. Ledge 59 prevents any sagging of the upper run of tape or belt 51 and hence retains this run of the belt in proper alignment with the sheets of the second form set 42. Bar 62, by overlying the side edge portion of the upper form sheet 46, prevents the sheets of that part of the second form set overlying platen 8 at any time from disengaging driving pins 50, so that positive movement of the sheets of the second form set is assured whenever knob 56 is turned.

The carbon roll 12 is provided with a carbon sheet 65 that is illustrated as narrower than the other carbon sheets 11 of this roll (see Fig. 9) to suit the requirements of a certain type of work as will further appear, although for other types of work the carbon sheet 65 may be of the same width as the sheets 11.

As the form sheets 43 to 46 constituting the second form set 42 are moved forwardly by means of knob 56 over the first form set 10 lying on the platen 8, the forward or leading edge of the second form set would tear or injure the transversely extending carbon sheet 65 if means were not provided for protecting the rearward side edge of this carbon sheet. This protecting means comprises a transverse horizontal plate member 66 overlying the first form set 10 on platen 8, which plate member is rigidly connected at one end portion to the forward end of a rearwardly extending bar 67. Bar 67 extends through a slide bearing bracket 68 fixed on the side rail 3 and has its rear end portion attached as by screws 69 to a collar 70 that is slidable along a round rod 71. Rod 71 has its end portions fixedly carried by brackets 72 secured to side bar 23 and this rod is provided with stop collars 73 ad-

justably fixed on this rod for limiting the sliding movement of collar 70.

A coil tension spring 74 has one end connected to one of the screws 69 and its other end connected to a rear cross bar 24 and normally serves to hold the collar 70 against the rear stop collar 73. A flexible cable 75 has one end connected to the collar 70, passes over a pulley 76 on forward cross-bar 24, and has its other end connected to a pedal lever 77 that is pivoted at 78 upon a fixed bar 79 carried by a cross-frame member 80. By depressing pedal lever 77, cable 75 serves to move slide collar 70 forwardly along rod 71 against the tension of spring 74, thereby moving bar 67 forwardly so that plate member 66 moves from its rear dot and dash position shown in Fig. 9 to its full line position shown in this figure, in which latter position the said plate member 66 overlies the rear edge portion of carbon sheet 65 in protecting relation. The forward edge portion of plate member 66 is upturned somewhat at 81 to facilitate the movement of this plate member over the rear edge of carbon sheet 65. With the plate member 66 in its forward position, the second form set 42 may be advanced over the first form set on platen 8 without injuring carbon sheet 65, since the plate member 66 overlies the rear edge of the carbon sheet 65 in protecting relation.

In order to maintain the several sheets of the second form set 42 together with the interleaved carbon sheets 48 in a smooth, flat, and unwrinkled condition, regardless of more or less forward and rearward movement of these sheets over the platen 8 in use, a finger strip 83 is provided which is secured at its rear end to a block 84 that is turnably mounted on a cross-bar 24 (see Figs. 6 and 9). Finger strip 83 preferably has a somewhat resilient forward end portion 85 for yieldably engaging the upper surface of the second form sheet 46, to thereby retain the second form set and also the first form set in flat condition over the platen 8. The weight of finger strip 83 together with that of block 84 causes this finger strip to bear with a definite light pressure against the second form set 42, which pressure may be varied at will by means of a screw 86 threaded through the lower portion of block 84 and engaging a cross-bar 24.

In use, assuming that it is desired to typewrite two sets of forms simultaneously, i. e. form sets 10 and 42, and that it is desired to typewrite a heading such as a name and address and perhaps other matter on the sheets of form set 10 which heading and other matter is not desired to be written on the sheets of form set 42, although the body of the typewritten material such as an order, bill, requisition, and, etc. is to be typewritten on both form sets. The first form set 10 is then pulled forwardly over platen 8, the sheets of the same being interleaved with the carbon sheets 11 as shown in Fig. 9, the narrower carbon sheet 65 overlying the top sheet of form set 10. The heading and any other material that is to be typed only on the sheet of form set 10, is now typed by use of typewriter 5 on the upper or heading portion of the top sheet of form set 10, i. e. on that portion of the top sheet that is to the rear of carbon sheet 65 and overlying carbon sheet 11. After this material has been typed, the form set 42 together with the interleaved carbon sheets or paper 48 are then advanced over the first form set 10 by turning knob 56, care being taken to depress pedal lever 77 so as to move plate member 66 into overlying and protecting relation to carbon sheet 65 and to also push handle 34 rearwardly so as to allow the carbon sheets 48 to feed along with the sheets 43 to 46 of form set 42.

After the sheets of form set 42 have been moved forwardly so as to overlie the form sheets 10 and the carbon sheets 11 and 65, the typewritten matter to appear on both form sets is typewritten upon the top sheet 46 of form set 42 in the area underlain by carbon sheet 65, this carbon sheet and carbon sheets 11 serving to transfer the typewriting to the sheets of the first form set 10. During the typewriting operations, the sheets of the first form set 10 are held at their forward edges by clamp bar 20, whereas the pins 50 of tape 51 acting in conjunction with bars 60 and 62 serve to hold the sheets of the second form set 42 and the carbon sheets 48 in fixed position.

After thus typewriting one sheet and producing the desired number of carbon copies of both form sets 10 and 42, the knob 56 is turned so as to further advance the second form set 42 so that the typewritten sheets move forwardly of platen 8 and may be torn off along the forward edge of this platen. During this turning movement of the knob 56 the handle 34 of push rod 32 is not touched so the carbon rolls 28 are held against turning by the action of pawls 30 engaging ratchet wheels 29 and hence the carbon sheets 48 do not feed beyond platen 8.

The knob 56 is then turned in the reverse direction causing the sheets of the second form set 42 together with the interleaved carbon sheets 48 to move rearwardly over the carbon sheet 65 and over the form set 10 thus exposing the typewritten heading of the top sheet of form set 10. Owing to the presence of the finger strip 83, the sheets of the form set 42 and the carbon sheets 48 are not allowed to bulge up or wrinkle during this movement but are caused to lie flat and produce slack in the vertical runs of the sheets 43 to 46 at the rear of the machine. The leaf springs 38 engaging the carbon rolls 28 prevent uncoiling of carbon paper from rolls 28 at this time. Clamp 20 is now released and the typewritten sheets of form set 10 pulled forwardly and torn off at the front edge of platen 8 preparatory to typewriting another set of sheets.

Thus, it will be seen that when using the improved machine of this invention, two sets of forms may be handled simultaneously, and these form sets may be similar as to size or dissimilar as shown in the drawings. Either the entire typewritten matter appearing on one form set may also appear on the other form set, in which case the carbon sheet 65 would be of the same width as the carbon sheets 11, or only a portion of the typewritten matter appearing on one form set need appear on the other form set, if desired, as described in connection with the operation of the machine.

The novel improved machine of this invention is very valuable in many lines of business where two sets of forms having the same or partially the same subject matter is desired.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, as defined by the following claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be

interpreted as illustrative and not in a limiting sense.

I claim:

1. A writing machine of the character described for operating upon two form sets simultaneously comprising, a frame, a platen carried by said frame, said platen being arranged to have the first form set pulled thereover, said frame carrying carbon sheets for interleaving with the sheets of the first form set, the top carbon sheet being arranged to overlie the first form set, and an endless tape member for moving the second form set over the first form set with its interleaved carbon sheets and over said top carbon sheet.

2. A writing machine of the character described for operating upon two form sets simultaneously comprising, a frame, a platen carried by said frame, said platen being arranged to have the first form set pulled thereover, said frame carrying carbon sheets for interleaving with the sheets of the first form set, the top carbon sheet being arranged to overlie the first form set, an endless tape member for moving the second form set over the first form set with its interleaved carbon sheets and over said top carbon sheet, and a member positioned intermediate the first and second form sets for protecting said top carbon sheet against the abrasive action of the advancing second form set.

3. A writing machine of the character described for operating upon two form sets simultaneously comprising, a frame, a platen carried by said frame, said platen being arranged to have the first form set pulled thereover, said frame carrying carbon sheets for interleaving with the sheets of the first form set, the top carbon sheet being arranged to overlie the first form set, an endless tape member for moving the second form set over the first form set with its interleaved carbon sheets and over said top carbon sheet, and a finger strip for yieldably engaging the upper surface of the second form set to prevent the wrinkling of this form set as it moves over the first form set.

4. A writing machine of the character described for operating upon two form sets simultaneously comprising, a frame, a flat platen carried by said frame, said platen being arranged to have the first form set pulled thereover, said frame carrying carbon sheets for interleaving with the sheets of the first form set, the top carbon sheet being arranged to overlie the first form set, an endless tape member having projections thereon for engaging and moving the second form set, having interleaved additional carbon sheets, over the first form set and over said top carbon sheet, and a plate member for overlying the edge portion of said top carbon sheet for protecting the same against the abrasive action of the advancing second form set.

5. A writing machine of the character described for operating upon two form sets simultaneously comprising, a frame, a flat platen carried by said frame, said platen being arranged to have the first form set pulled thereover, said frame carrying carbon sheets for interleaving with the sheets of the first form set, the top carbon sheet being arranged to overlie the first form set, an endless tape member having projections thereon for engaging and moving the second form set, having interleaved additional carbon sheets, over the first form set and over said top carbon sheet, a plate member for overlying the edge portion of said top carbon sheet for protecting the same against the abrasive action of the advancing second form set, and a finger strip for yieldably engaging the upper surface of the second form set to prevent the wrinkling of this form set as it is moved over the first form set.

6. A writing machine of the character described for operating upon two form sets simultaneously comprising, a frame, a flat platen carried by said frame, said platen being arranged to have the first form set pulled thereover, said frame carrying carbon sheets for interleaving with the sheets of the first form set, the top carbon sheet being arranged to overlie the first form set, a carbon roll frame supported upon said frame, turnable carbon roll shafts mounted on said carbon roll frame and having carbon rolls thereon, spring means engaging the carbon rolls for preventing the accidental unwinding thereof, a movable endless tape member having projections thereon for engaging apertures in the second form set for moving the latter, the sheets of the second form set being interleaved with additional carbon sheets fed from said carbon rolls, and mechanism for moving said endless tape to effect movement of the second form set over the first form set.

7. A writing machine of the character described for operating upon two form sets simultaneously comprising, a frame, a flat platen carried by said frame, said platen being arranged to have the first form set pulled thereover, said frame carrying carbon sheets for interleaving with the sheets of the first form set, the top carbon sheet being arranged to overlie the first form set, a carbon roll frame supported upon said frame, turnable carbon roll shafts mounted on said carbon roll frame and having carbon rolls thereon, spring means engaging the carbon rolls for preventing the accidental unwinding thereof, a movable endless tape member having projections thereon for engaging apertures in the second form set for moving the latter, the sheets of the second form set being interleaved with additional carbon sheets fed from said carbon rolls, mechanism for moving said endless tape to effect movement of the second form set over the first form set, and pawl and ratchet mechanism cooperating with said carbon roll shafts for stopping the feeding of carbon sheets from said carbon rolls at will.

8. In a writing machine of the character described for operating upon two form sets simultaneously, a flat platen arranged to have carbon paper of various widths extend across the same, a plate member overlying the rear of said platen and having an upturned forward edge portion, means for normally holding said plate member in a rearward out of the way position so as not to interfere with typewriting upon said platen, and mechanism for moving said plate member forwardly a distance depending on the width of the upper transverse sheet of carbon paper, so that its upturned edge portion moves over the edge portion of the upper carbon paper sheet to thereby protect the latter against the abrasive action of a form set passing thereover.

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