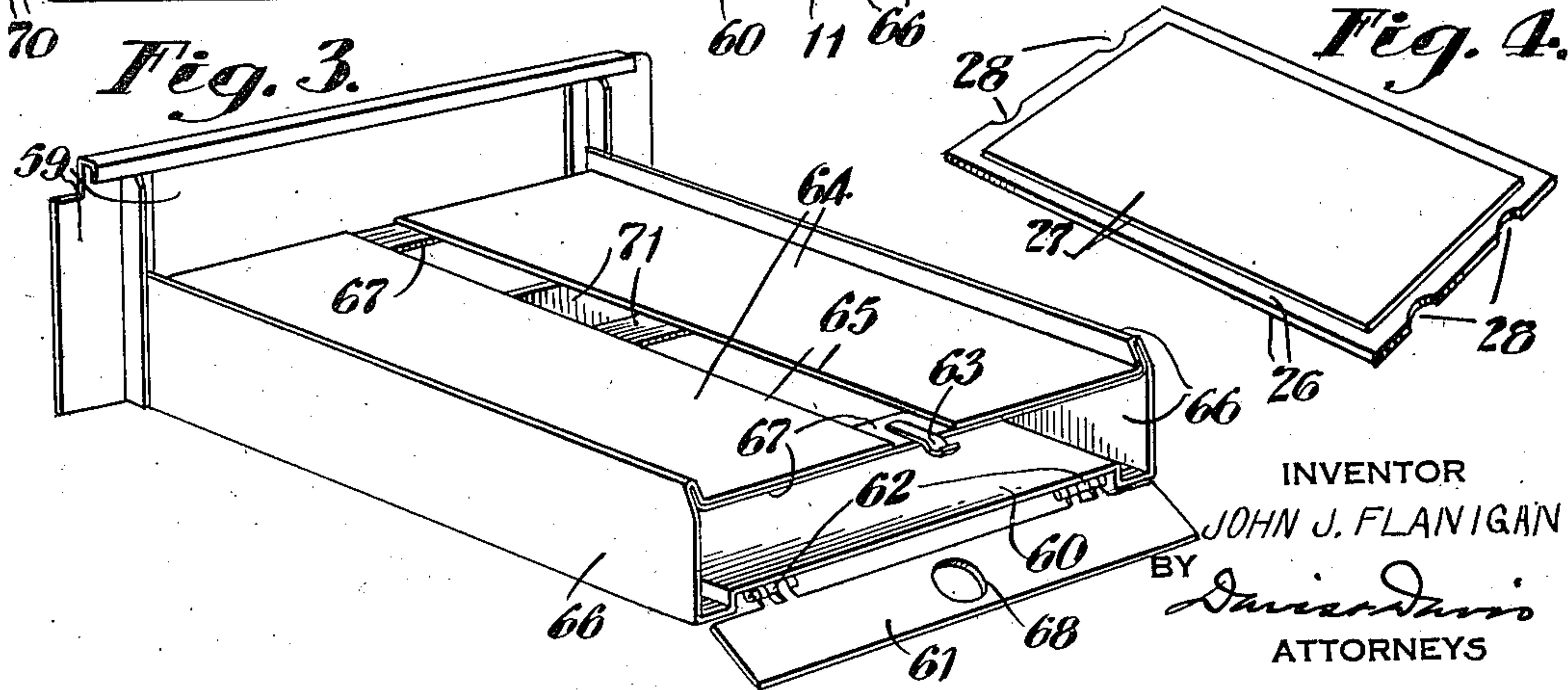
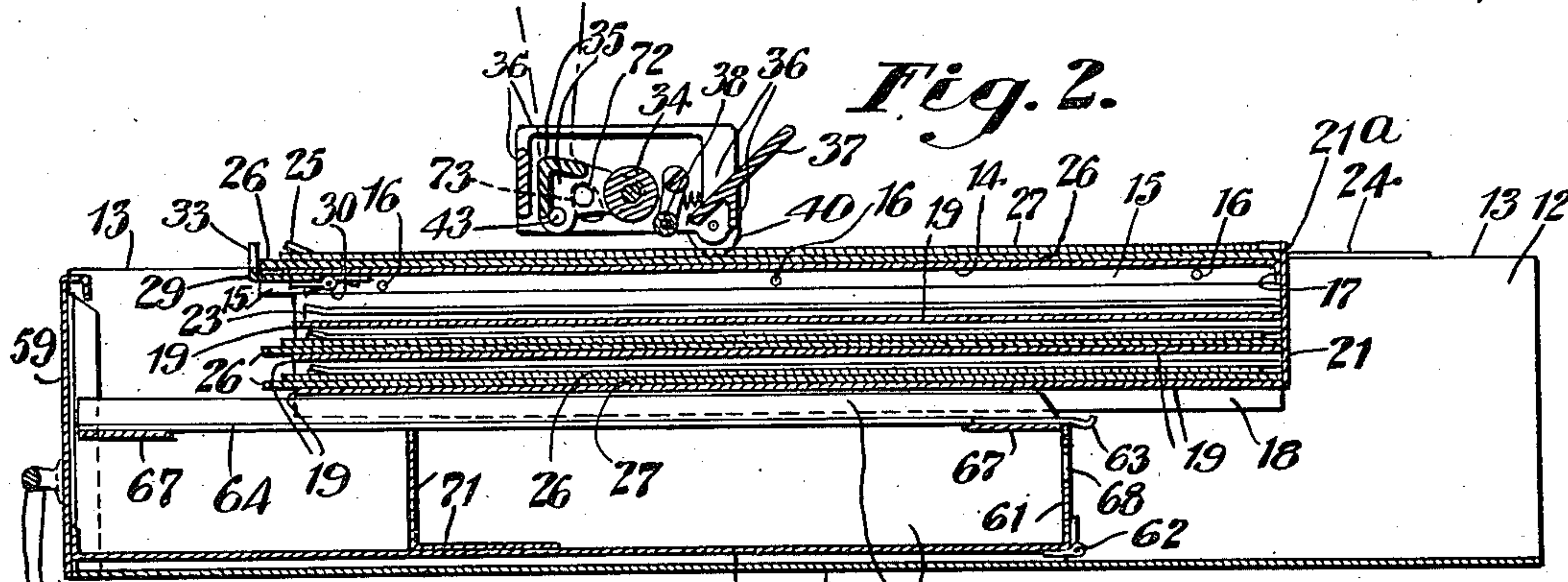
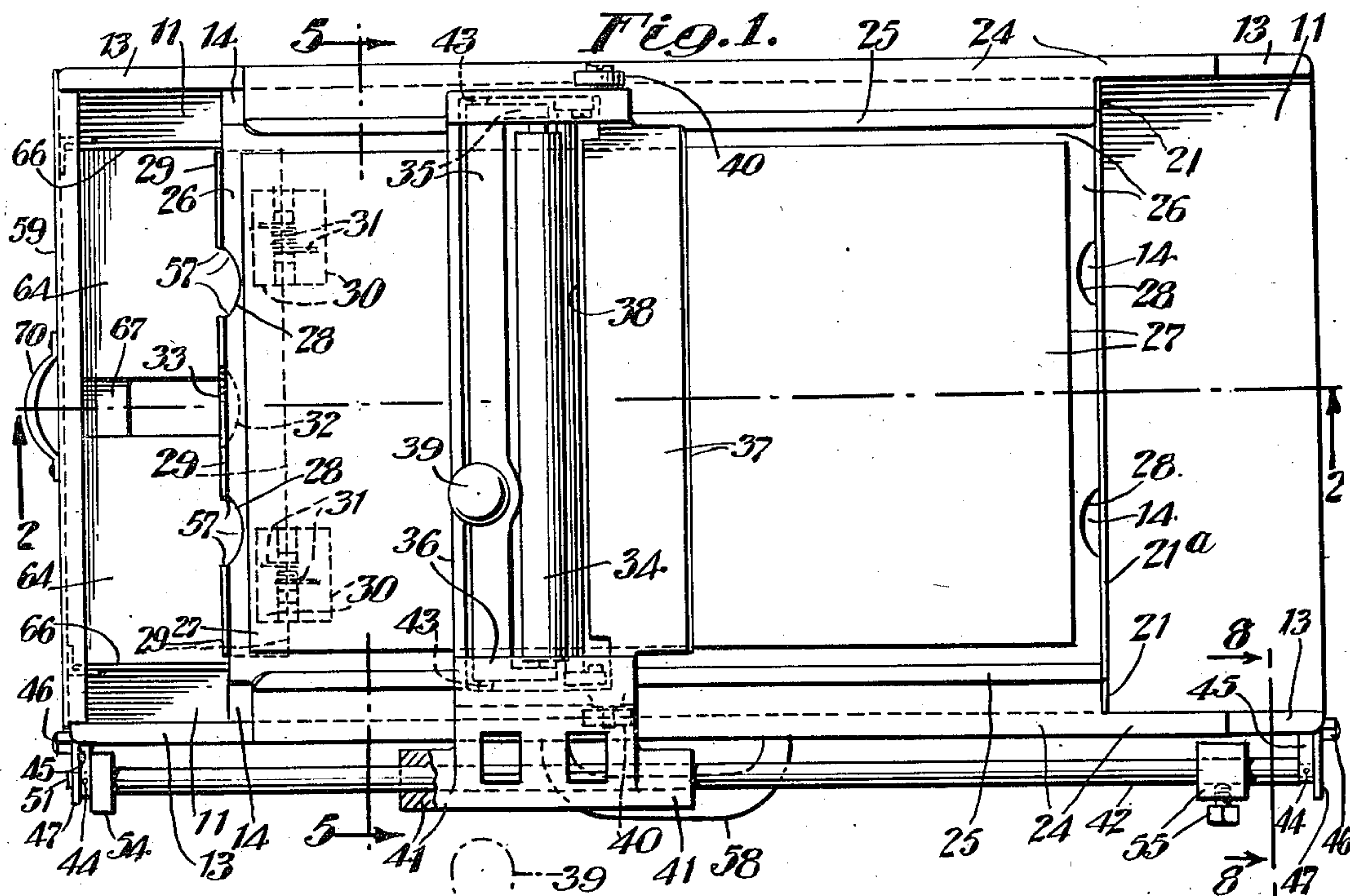


2,011,713

DUPLICATOR

Filed Feb. 20, 1934

2 Sheets-Sheet 1



INVENTOR
JOHN J. FLANIGAN
David Davis
ATTORNEYS

Aug. 20, 1935.

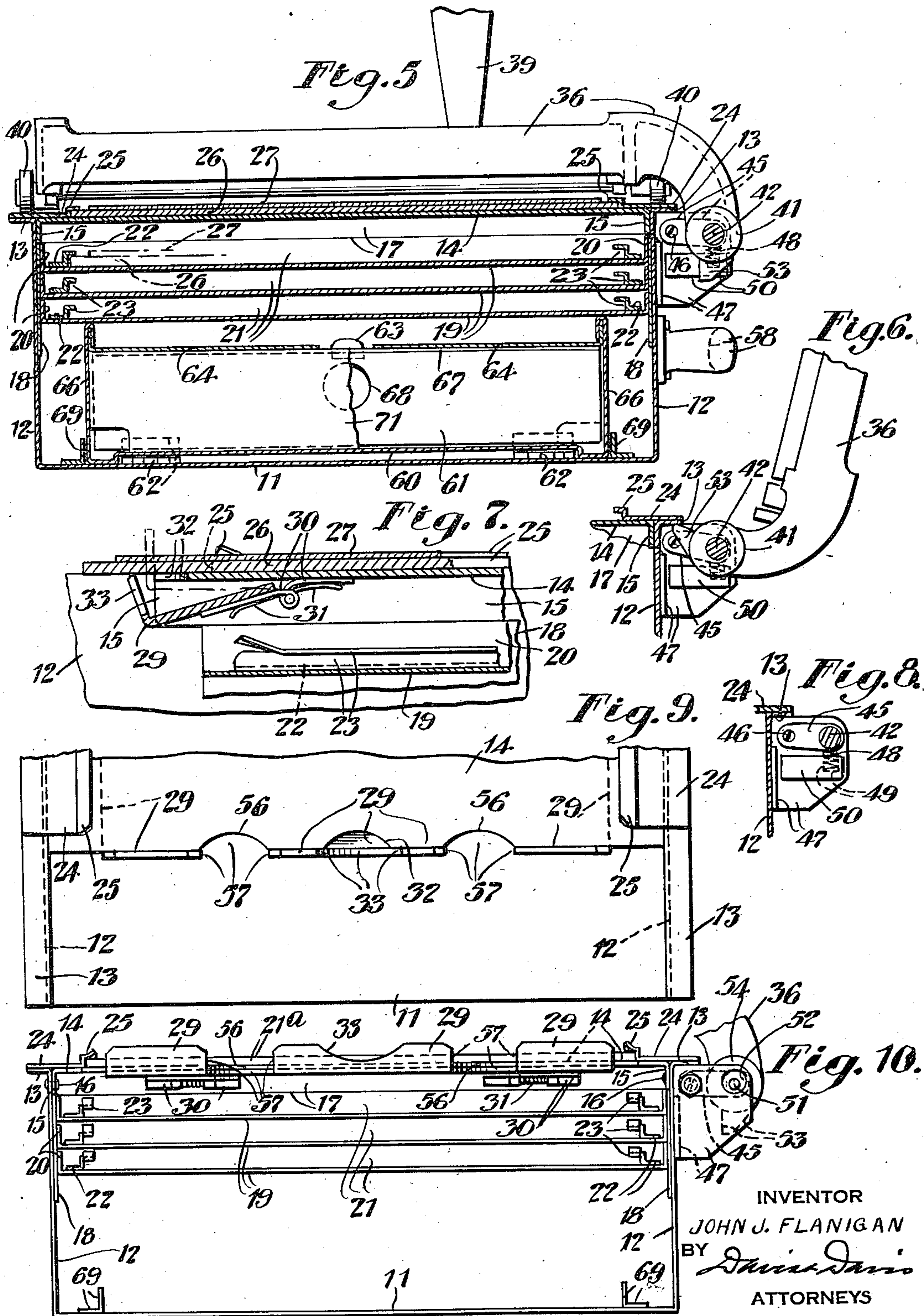
J. J. FLANIGAN

2,011,713

DUPLICATOR

Filed Feb. 20, 1934

2 Sheets-Sheet 2



INVENTOR

JOHN J. FLANIGAN

BY

David Davis

ATTORNEYS

UNITED STATES PATENT OFFICE

2,011,713

DUPLICATOR

John J. Flanigan, Oak Park, Ill., assignor to L. C. Smith & Corona Typewriters, Inc., Syracuse, N. Y., a corporation of New York

Application February 20, 1934, Serial No. 712,116

17 Claims. (Cl. 101—133)

This invention relates to improvements in duplicators of the hectograph type.

The invention provides a hectograph duplicator of simple and sturdy construction which is compact and light and which may be placed on any table, desk or other convenient support for operation and may be readily carried from place to place.

The invention also provides an improved detachable duplicating or hectograph medium for the duplicator in the form of a slab or tablet having a hectograph or gelatin copying material on one face thereof, which slab or tablet is so constructed as to facilitate stripping of sheets from its gelatin surface and to permit it to be reversed end for end in the duplicator and to be readily secured in place and removed.

The invention also provides improved means for supporting and holding the detachable slab in operative position in the duplicator; provides an improved construction of the duplicator whereby extra tablets may be stored beneath the bed of the duplicator, and provides a combined paper holding drawer and copy holding tray removable from the duplicator and adapted to facilitate the operation of producing copies.

The invention further provides an improved margin bar for the duplicator, an improved mounting and arrangement of said bar, and an improved construction of the bed of the machine. The construction and arrangement of the margin bar and bed are such as to facilitate stripping of a sheet from a gelatin tablet held on the bed and to facilitate removal of a tablet from the bed, the margin bar serving as a gauging device for sheets laid on the tablet held to the bed and also serving as a holding element for the tablet shiftable to permit removal of the tablet from the bed.

The invention further provides improved means for supporting and guiding an impression roller carriage which is reciprocable longitudinally of the bed to lay or impress sheets upon the slab or tablet held on the bed and is adapted to be swung upward and laterally away from the bed to an inoperative position.

Other objects and advantages of the invention will appear from the following description of the preferred embodiment of the invention illustrated in the accompanying drawings.

In the drawings:

Fig. 1 is a plan view of a duplicator embodying the invention;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a perspective view of the combined

drawer and tray removed from the duplicator, the door of the paper holding compartment being shown opened;

Fig. 4 is a perspective view of one of the hectograph slabs or tablets;

Fig. 5 is a sectional view on the line 5—5 of Fig. 1;

Fig. 6 is a fragmentary sectional view on the same line as Fig. 5, showing the carriage supported in inoperative position;

Fig. 7 is a fragmentary sectional view on the same line as Fig. 2 showing how the slab or tablet is applied to and removed from the bed;

Fig. 8 is a fragmentary sectional view on the line 8—8 of Fig. 1;

Fig. 9 is a fragmentary plan view of the duplicator showing the front end portion of the frame with the slab or tablet removed from the bed member of the frame; and

Fig. 10 is a fragmentary front elevation of the duplicator, all of the slabs and the drawer being removed.

The main body of the frame of the machine is a trough-like sheet metal member consisting of a flat bottom wall 11 and flat vertical longitudinal side walls 12, each of which walls 12 has at its upper edge an outwardly extending flange 13 disposed in a horizontal plane. The flat sheet metal bed member 14 of the frame lies in the same horizontal plane as flanges 13 and itself has pendent vertical flanges 15 at its longitudinal side edges abutting the inner faces of walls 12 of the frame and held to said walls preferably by rivets 16 (Figs. 2 and 5) and/or by welding. The bed terminates short of the front and rear ends of the main body member of the frame and is provided at its rear edge with a pendent vertical flange 17. Underlying the bed flanges 15 are sheet metal stiffening plates 18 welded or otherwise affixed to walls 12.

Underlying the bed are three superposed and horizontally disposed sheet metal shelves 19 for supporting three hectograph slabs stored under the bed. Each shelf 19 has vertical longitudinal edge flanges 20 welded or otherwise affixed to plates 18. Welded or otherwise affixed to flange 17 and to the rear ends of plates 18 and flanges 20, or otherwise secured in the frame, is a flat vertical sheet metal frame plate 21 extending from one to the other of the walls 12 and terminating at the lowermost one of shelves 19. This plate 21 extends up to the bed 14 and has a reduced upstanding extension or upper end portion 21a projecting a short distance above the top surface of bed 14 along the rear edge of the bed.

Extending along the top face of each shelf 19 adjacent the opposite longitudinal side edges of the shelf are two metal bars 22 welded or otherwise affixed to the shelf and each having 5 along its inner edge an inverted L-shaped flange 23 the horizontal leg of which is directed inward over the shelf and is preferably upturned slightly at its forward end as shown. The shelves 19 are preferably slightly shorter than the bed 14 10 as shown, the rear end edges of the shelves lying in the vertical plane of the rear edge of the bed.

Two flat sheet metal bars 25 extend longitudinally of the frame at opposite sides of the frame, each lying flat upon the upper face of 15 a different one of the flanges 13 and the upper face of an adjacent marginal portion of bed 14, and each also being welded or otherwise secured to the underlying flange and bed. Each bar 24 is provided along its inner edge with an inverted 20 L-shaped flange 25 which extends substantially the full length of the bed with the horizontal leg of the flange directed inward over the bed. Bars 24 extend substantially the full length of the bed and have narrow end portions extending rearward beyond the rear end of the 25 bed and overlying flanges 13, as shown. The horizontal leg of each flange 25 is preferably bent upward slightly at its front end, as shown.

The hectograph slab or tablet element of the 30 duplicator consists of a rigid and flat backing or base portion 26 of rectangular form (preferably oblong) in plan and a hectographic or gelatin layer or upper portion 27 of similar but smaller shape in plan adhering or affixed to the base 35 portion, the portion 27 being centered on the base portion to leave uniform marginal end portions and uniform marginal side portions of the base 26 exposed. The base 26 of the tablet is 40 formed of material highly resistant to warping and not subject to corrosion, such as a flat slab of waterproofed press-board or other rigid fibrous material. The layer of gelatinous hectographic material 27 and the base 26 to which it is af- 45 fixed form a composite slab or tablet. The marginal front and rear end portions of base 26 are identically notched, preferably each having a pair of finger clearance notches 28 cut therein, the arrangement of the two notches at one end corresponding exactly with that of the two notches 50 at the other end. The length of the tablet corresponds to the length of the bed, the width of the tablet corresponds to the spacing apart of the vertical legs of the two flanges 25, the thickness of the base 26 of the tablet corresponds 55 to the vertical spacing of the horizontal legs of flanges 25 from the bed 14, and the width of the longitudinal marginal portions of the tablet is at least equal to, and preferably, as shown, greater than the width of the horizontal legs of flanges 25.

60 A tablet is attached to the frame in position for use by sliding it longitudinally rearward over the bed, with the gelatin layer uppermost and with the longitudinal marginal portions of the tablet engaged in the ways formed by the guiding and retaining flanges 25, until the rear edge 65 of the tablet base abuts the upwardly projecting end portion 21^a of plate 21. The tablet is thus held against movement in all directions except forwardly, with the forward edge of its base 70 flush with the front edge of bed 14. The tablet is releasably locked in this position by means of a combined margin bar and tablet holding device 29.

75 The margin bar and tablet holder comprises a sheet metal bar having a flat body portion un-

derlying the forward end portion of bed 14 and hinged at its rear end to the bed to swing up and down by a pair of hinges 30. A pair of hinge springs 31 normally hold the flat body portion of the bar in a horizontal plane with the 5 upper face of said body portion abutting the bottom face of the bed. Along its front edge said bar has a flange lying at right angles to the main body of the bar and normally extending vertically upward at the front edge of bed 14 to a level higher than the bed and the hectograph slab 26—27 on the bed, said flange normally abutting the front edge of the base 26 10 of slab 26—27 on the bed to hold the slab against forward movement, and said flange projecting to a level higher than the slab for engagement by 15 an edge of a master or a copy sheet to gauge or position the sheet. A sheet to be laid or impressed upon the hectographic layer of the slab is gauged or positioned by engaging one edge 20 thereof behind the upstanding portion of the margin bar projecting above the level of the slab.

The bar is depressible against the resistance of the hinge springs to an ineffective position shown in Fig. 7 permitting a slab 26—27 to be 25 slid horizontally on to and off the bed. As will appear from Fig. 7, the bar 29 may be shifted to ineffective position without contacting a slab on the topmost shelf 19, and will automatically return to effective position when a slab is 30 pushed rearward into engagement with stop portion 21^a of plate 23. To facilitate withdrawal of a slab from the bed, the front edge of the bed is provided centrally thereof with a finger clearance notch 32 to permit grasping of the 35 foremost marginal portion of the base 26 of the slab. The upstanding portion of margin bar 29 is provided with a central figure clearance notch 33 opposite notch 32 so that the extent to which the bar must be depressed to permit 40 the aforesaid grasping of the slab is reduced.

While master and copy sheets used in connection with the duplicator may be laid or impressed upon the gelatin surface of the slab on 45 bed 14 by hand or a hand roller, the duplicator is preferably provided with a suitable impression roller and impression roller carriage for this purpose. A well known form of carriage and roller device for laying or impressing the sheets 50 is shown, wherein the impression roller 34 is journaled in an up and down swinging yoke 35 pivotally supported at 43 in a carriage 36 which is reciprocable fore-and-aft of the machine over the bed and the slab thereon, said carriage having a paper table 37 and also having the usual 55 feed roller 38 spring urged forward to press a sheet to the roller 34 when the latter is moved down to press a sheet inserted between rollers 34 and 38 to the gelatin surface of the slab. The usual operating handle 39 is fixed to the yoke. 60 In the drawings the impression roller or platen 34 is shown lifted from its sheet pressing position into position for insertion of a sheet into the carriage between rollers 34 and 38. The carriage is provided with the usual pair of supporting wheels 40 journaled on the carriage, and 65 has the usual pair of fore-and-aft spaced sleeves 41 at one end thereof pivotally and slidably connecting the carriage to a horizontal guide rod 42 extending longitudinally of the duplicator at 70 the right hand side of the frame.

In the construction shown, however, the wheeled carriage is supported and guided by improved means. In the improved construction, the supporting wheels adjacent the opposite 75

ends of the carriage overlies and normally rest upon two tracks on the frame, each of which tracks is formed by one of the flanges 13 and the overlying portion of that one of the bars 24 which is welded or otherwise fixed to said flange and the adjoining marginal portion of bed 14. Rigid supporting tracks for the carriage are thus provided on the sheet metal frame.

In the improved construction the guide rod 42 is supported on the frame in an improved manner for limited up and down movement without tilting. Said rod has reduced end portions fastened by pins 44 (Fig. 1) in the outer ends of a pair of arms 45, said arms being pivoted at their inner ends at 46 on the outwardly projecting portions of brackets 47 welded or otherwise affixed to the right hand side wall 12 of the frame at the outer face of said wall at opposite ends of the wall below flange 13 of said wall. The weight of rod 42 and arms 45 is counterbalanced by a compression spring 48 which projects upward from a socket 49 in a block 50 welded or otherwise affixed to the rear one of the brackets 47, the projecting upper end of said spring 48 engaging under the outer end portion of the rear one of the arms 45. The forward reduced end portion 51 of guide rod 42 extends forward through an aperture 52 (Fig. 10) in the forward one of the brackets 47 and is normally out of contact with the edge of the aperture as shown in Fig. 10. End portion 51 of rod 42 is adapted to engage the edge of the aperture at the top and bottom of the aperture to permit only a small amount of up and down movement of the rod.

The carriage wheels are coactive with the frame tracks to support the carriage out of contact with the hectograph slab on the bed when the impression roller is in its inactive raised position. When the impression roller is forced down to its active position pressing a sheet to the slab the carriage is lifted slightly, lifting the wheels from the tracks. The improved construction permits the carriage and impression roller to rise and fall to compensate for variations in thickness of the sheets used and of the slab on the bed and at the same time the carriage and roller are adapted to assume parallelism with the bed at the different required levels and to reciprocate over the bed without fore-and-aft tilting and without lateral skewing. When it is desired to have unobstructed access to the bed, or the slab thereon, the carriage is swung upward and to the right into the position shown in Fig. 6, part 51 of rod 42 engaging the bottom of aperture 52 after a slight downward movement of the rod to prevent the rod from dropping so far that a pair of stop and supporting lugs 53 (one on each sleeve 41) cannot engage as shown in Fig. 6, under the two-ply frame track at the right hand side of the machine.

A stop 54 on guide rod 42 arrests forward movement of the carriage at a sheet inserting point at which the impression roller is depressible on to the slab at the forward end of the gelatin layer 27. The usual rearward sheet laying or impressing movement of the carriage may be limited by a stop device 55 on the rod 42, which device is adjustable longitudinally of the rod.

To facilitate stripping of a sheet from the hectograph slab by hand, after the sheet has been pressed on the slab by the roller 34 during a rearward sheet laying movement of the carriage, the bed 14 is provided at its front edge with a pair of finger clearing notches 56 registering with the

pair of notches 28 in the front edge of the reversible and detachable slab, and the margin bar is cut away entirely through its upstanding flange portion and rearward part-way through its normally horizontal portion to provide two finger clearance notches 57 extending back through the front of the bar and positioned to register with the bed notches 56 in the normal position of the margin bar. It is thus possible to grasp the front edge of the impressed sheet with the fore-finger and thumb of each hand and peel it upward and rearward off the gelatin surface of the pad or slab on the bed.

A suitable handle 58 is affixed to the right hand side wall 12 of the frame for use in carrying the duplicator, which is preferably about three times the size shown in Figs. 1 and 2, so as to be light and compact but still capable of handling sheets within the usual size range.

Preferably provision is made for storage of a supply of clean paper sheets and for handling said sheets during the making of a run of hectograph copies. To these ends there is removably held in the frame a sheet metal, combined paper-holding box and tray comprising a box having a front wall 59, a bottom wall 60, a rear wall or end door 61 hinged at 62 to the bottom wall and releasably held closed by a spring latch 63, a divided top wall 64 providing a longitudinal finger clearance slot 65 in the top of the box, and side walls 66 which project above the top wall as does also the front wall to form an open tray at the top of the box. Preferably sheet metal cross-bars 67 are held to the top and side walls to stiffen and support the divided top wall. The front wall of the box extends outward beyond the side walls thereof to abut the front ends of the side walls 12 of the frame of the duplicator when the combined box and tray is slid into the frame as shown in Figs. 1 and 2. The rear wall or box door 61 is preferably provided with a finger hole 68 to facilitate pulling open the hinged rear wall or door. The bottom wall of the box is depressed slightly along its longitudinal edges to form supports slidable on the bottom wall 11 of the frame between sheet metal guide rails 69 welded or otherwise affixed to wall 11. The upwardly projecting portions of the side walls of the box slide under and substantially in contact with the lowermost shelf element 19 of the frame. A finger pull handle 70 is affixed to the front wall of the box. A sheet stack follower 71 is slidable in the box.

A stacked supply of clean paper sheets may be stored within the closed box in the frame. When it is desired to take a run of copies from a negative impression transferred from a master sheet to the gelatin surface of the slab on the bed, the combined box and tray is withdrawn from the machine, placed alongside of the machine, the door 61 opened, and the follower 71 pushed toward the doorway to partly push the stack of sheets out of the box over the opened door where the sheets may be readily picked up one at a time for laying a sheet on, and stripping the sheet off of the slab on the bed. As each sheet is stripped from the slab on the bed it is stacked in the open tray at the top of the box, when the run is completed the stack of copies is removed from the tray.

A stop 72 on the impression roller yoke 35 engages the wall of an aperture 73 in the carriage to limit swinging of the yoke and determine the inactive position and the active or sheet impressing position of the impression roller in the carriage.

What I claim is:

1. A duplicator comprising a rectangular hectograph slab, a bed for said slab, means fixed relatively to the bed and abutting three edges and the upper face of said slab to prevent shifting movement of the slab relatively to the bed except edgewise sliding movement of the slab in one direction, and means abutting the fourth edge of the slab to prevent edgewise sliding movement of the slab in said one direction and shiftably supported for movement relatively to said bed into a position permitting edgewise withdrawal of the slab in said one direction from the bed.
2. A duplicator as claimed in claim 1, wherein said shiftably supported slab-engaging means comprises a margin bar having means for gauging a sheet to be impressed upon the hectograph slab.
3. A duplicator as claimed in claim 1, wherein said shiftably supported slab engaging means is pivotally mounted and is spring-urged into slab-engaging position.
4. A duplicator as claimed in claim 1, wherein said shiftably supported slab-engaging means is a sheet-gauging margin bar supported adjacent one end of the bed to move down and up respectively from and to a position for engaging one end edge of the slab, said margin bar having means projecting above the margin bar engaged end of the slab, when said bar is in slab-engaging position, for engagement with said means of one edge of a sheet to be laid upon the slab.
5. A duplicator as claimed in claim 1, wherein said shiftably supported slab-engaging means is a margin bar hinged to the under side of the bed adjacent one end of the bed to swing up and down, said margin bar being spring-urged upwardly and having a flat main body portion normally engaged flatwise with the bed under the bed and a slab-engaging and sheet-gauging flange portion normally projecting upwardly at the adjacent end edge of the bed above the plane of the upper surface of the slab.
6. A duplicator comprising a bed for a hectograph slab, said bed having a finger clearance notch in one end edge thereof, a hectograph slab, and means for releasably holding said slab on said bed with either end edge of said slab at the notched end edge of the bed, said slab having its end edges provided with finger clearance notches arranged for registration of one of the slab notches with the bed notch when the slab is held on the bed by said means with either of the end edges of the slab at the notched end of the bed, said slab-holding means permitting access to the registered bed and slab notches.
7. A duplicator comprising a frame including a bed for a hectograph slab, said bed having a finger clearance notch in one end edge thereof, a hectograph slab resting on said bed, a sheet-gauging margin bar at the notched edge of the bed abutting one end edge of the slab, and shiftably supported for downward movement below the bed to release the slab, stationary means on the frame forming slideways in which the side edges of the slab are engaged, and stationary means on the frame abutting the opposite end edge of the slab, said slab having a finger clearance notch in one end edge thereof registering with the bed notch and also having a finger clearance notch in its opposite end edge adapted to register with the bed notch when the slab is reversed end for end on the bed, and said margin bar being provided with a finger clearance notch registering with said registered bed and

slab notches when said bar is in slab-engaging position.

8. A duplicator as claimed in claim 7, wherein the margin bar is hinged to the bed under the bed and has a sheet and slab abutting flange extending upwardly at the notched end of the bed, said bar and end of the bed each have a pair of finger clearance notches therein, which pairs of notches are in register, and the slab has a pair of finger clearance notches in each end edge thereof and identically located along said two slab edges, one of which pairs of notches registers with the registered pairs of bed and margin bar notches.

9. A duplicator comprising a bed, a hectograph slab, stationary means for holding the hectograph slab to said bed for sliding of the slab on to and off the bed from one end edge only of the bed, said means and bed holding the slab against facewise movement with one end edge of the slab at said end edge of the bed, said end edge of the bed having a finger clearance notch therein underlying the adjacent portion of the slab, a sheet-gauging margin bar having a body portion hinged to the bed adjacent the notched end edge of the bed to swing up and down about an axis parallel to said end edge of the bed, and spring means yieldably holding said body portion of the bar flatwise against the under face of the bed, said bar having an upstanding slab-holding and sheet-gauging flange, which flange normally projects upwardly above the bed and slab along the notched end edge of the bed and is also provided with a finger clearance notch opposite said bed notch.

10. A duplicator as claimed in claim 7, wherein the slab comprises a gelatinous upper layer and a rigid base, said base alone being engaged by said margin bar and said stationary means, the gelatinous layer leaving exposed side and end marginal portions of the base, and the slab notches being formed solely in the exposed marginal end portions of the base.

11. A duplicator comprising a hectograph slab, an impression roller carriage reciprocable over said slab, and having supporting wheels, a carriage guide rod to which the carriage is slidably held, and a sheet metal supporting frame for said slab and carriage and guide rod, said frame comprising a base member having a bottom wall and two opposed upstanding side walls, said side walls having outward projecting flanges at their upper ends, a bed for said slab extending between the upper ends of said side walls in the plane of said flanges and having pendent edge flanges held to the side walls at the inner faces of said walls, and a pair of flat bars overlying the side wall flanges and adjacent marginal portions of the bed and held to said flanges and bed, each said bar having along its inner edge an inverted L-shaped flange the horizontal leg of which overhangs the slab, said L-shaped flanges forming slide ways for the slab, and the wall flanges and superposed portions of the bars forming two-ply tracks for the supporting wheels of the carriage, and said guide rod being supported on the frame at the outer side of one of the side walls of said base member and extending longitudinally of said wall.

12. A duplicator, as claimed in claim 11, having in said frame below the bed a plurality of superposed sheet metal shelves for extra hectograph slabs, said shelves being supported from the side walls of the base member, an upstanding sheet metal plate extending transversely of the base

member at one end of the bed and series of shelves and extending upwardly beyond the level of the bed to form an abutment for one end of slabs slid upon the bed and shelves, and a combined sheet-gauging margin bar and slab retainer supported to swing up and down at the opposite end of the bed into and out of its gauging and slab-retaining position.

13. In a hectograph duplicator, the combination of a frame including a rectangular bed for supporting a hectograph slab, means fixed relatively to said frame forming slab-retaining slide-ways extending along the longitudinal side edges of the bed to receive the side edges of a rectangular hectograph slab slid endwise on to the bed, slab-end abutting means fixed relatively to said bed at one end of the bed to abut one end edge of such a slab, and a combined sheet-gauging margin bar and slab retainer shiftably supported on the frame to move up and down at the other end of the bed between a sheet-gauging and slab-retaining position in which said bar is positioned to abut the other end edge of such a slab and a position in which such a slab may be slid endwise on to or off of the bed.

14. In a hectograph duplicator, the combination of a frame including a rectangular bed for supporting a hectograph slab, means fixed relatively to said frame forming slab-retaining slide-ways extending along the longitudinal side edges of the bed to receive the side edges of a rectangular hectograph slab slid endwise on to the bed, slab-end abutting means fixed relatively to said bed at one end of the bed to abut one end edge of the slab, a combined sheet-gauging margin bar and slab retainer shiftably supported on the frame to move up and down at the other end of the bed between a sheet-gauging and slab-retaining position in which said bar is positioned to abut the other end edge of such a slab and a position in which such a slab may be slid endwise on to or off of the bed, and means yieldingly holding the margin bar normally in said sheet-gauging and slab-retaining position of the bar.

15. A hectograph duplicator comprising a sheet metal base member having a bottom wall and two opposed side walls, a sheet metal top wall supported from said side walls, a series of superposed sheet metal shelves between the top and bottom walls and supported from the side walls, a transverse upstanding sheet metal plate supported from the top and side walls at one end of said series of shelves and the top wall and extending upwardly from the lowermost shelf to a point above the level of the top wall, and a pair of sheet metal bars held to the top wall extending along the upper face of said top wall at opposite side edges of said top wall between said up-

standing plate and the opposite end of the top wall, each said bar having an inverted L-shaped flange at its inner edge forming with said top wall a channel adjacent one side edge of said top wall, and a hectograph slab removably seated on the top wall with one end thereof abutting said transverse plate and opposite side edge portions thereof engaged in the channels formed by said top wall and said inverted L-shaped flanges.

16. A hectograph duplicator comprising a sheet metal base member having a bottom wall and two opposed side walls, a sheet metal top wall supported from said side walls, a series of superposed sheet metal shelves between the top and bottom walls and supported from the side walls, a transverse upstanding sheet metal plate supported from the top and side walls at one end of said series of shelves and the top wall and extending upwardly from the lowermost shelf to a point above the level of the top wall, and a pair of sheet metal bars held to the top wall extending along the upper face of said top wall at opposite side edges of said top wall between said upstanding plate and the opposite end of the top wall, each said bar having an inverted L-shaped flange at its inner edge, and a hectograph slab removably seated on the top wall with one end edge thereof abutting said transverse plate and its opposite side edge portions confined between the top wall and said inverted L-shaped flanges, and a slab-retainer pivotally supported to move up and down into and out of a slab-retaining position in which it projects above the level of the top wall at that end of said wall opposite the one at which the transverse plate is located to abut the other end edge of the slab.

17. A hectograph duplicator comprising a frame including a bed, a sheet-laying carriage reciprocable over said bed longitudinally of the frame and bed, a pair of brackets held to the frame at one side of the frame and extending outwardly from the frame, a pair of outwardly extending arms pivotally held at their inner ends to said brackets, a guide rod having reduced end portions fixed in the outer ends of said arms, said carriage being slidably and pivotally held to said guide rod, one of said brackets having a socket underlying one of said arms, and a compression spring having its upper end engaged under said last-mentioned arm and its lower end seated in said socket and adapted to counterbalance the weight of the arms and guide rod, the other one of said brackets having an aperture therein through which projects the adjacent reduced end portion of the guide rod to limit up-and-down movement of the guide rod.

JOHN J. FLANIGAN.