

Sept. 21, 1965

J. P. WALSH

3,206,859

PRINTING APPARATUS

Filed June 17, 1960

4 Sheets-Sheet 1

FIG - 1

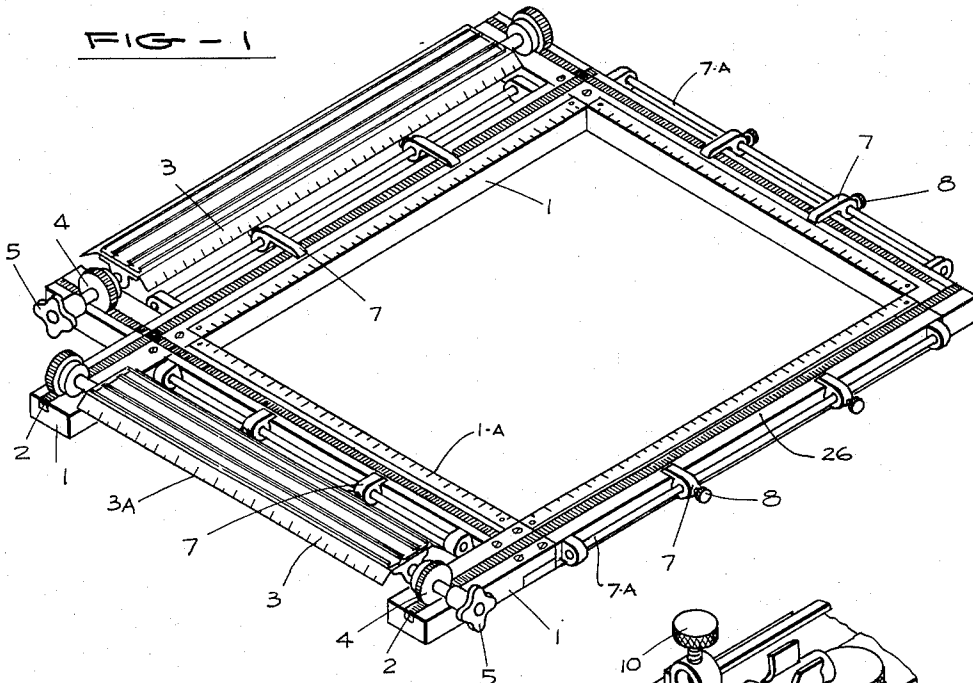
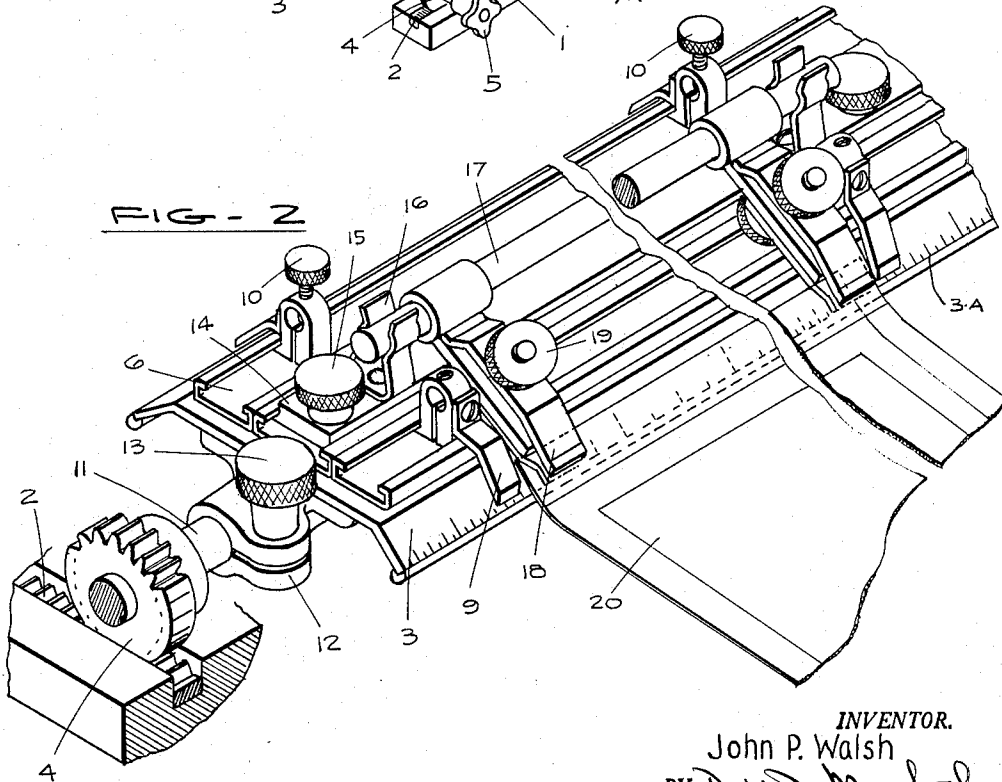


FIG - 2



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4 Sheets-Sheet 3

FIG - 6

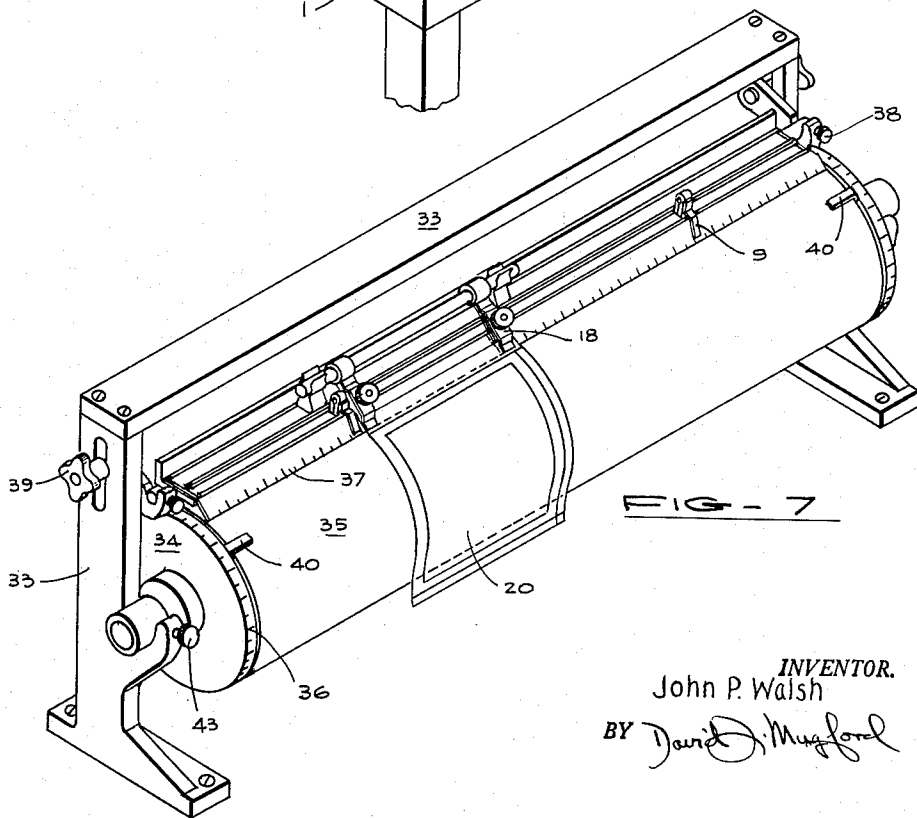
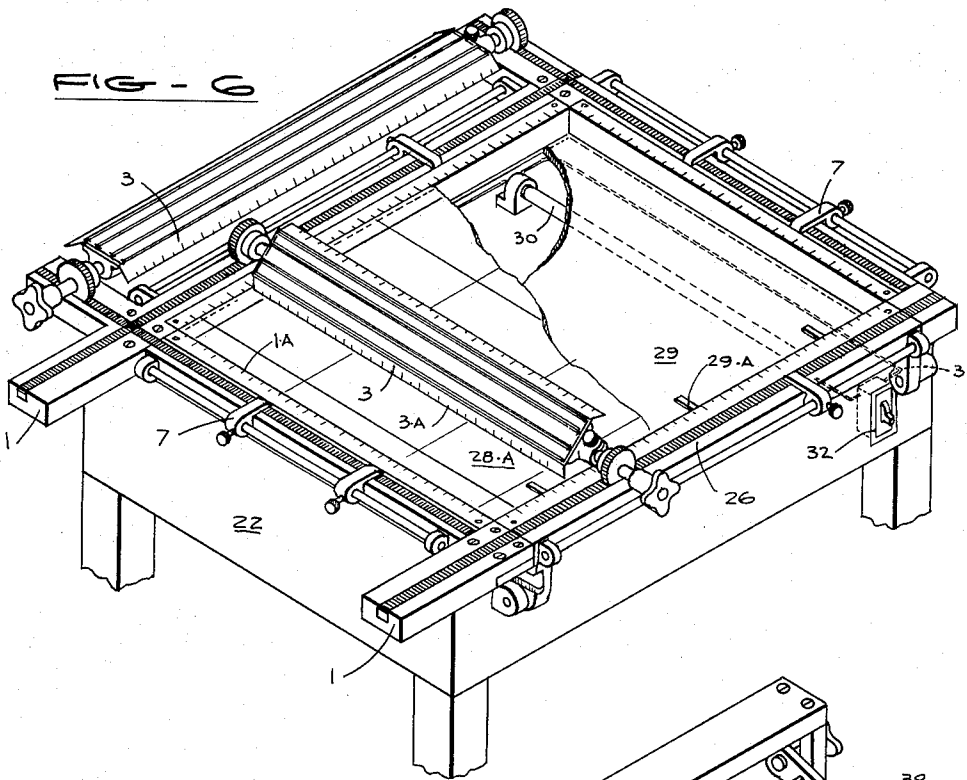


FIG - 7

INVENTOR.
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BY David D. Mumford

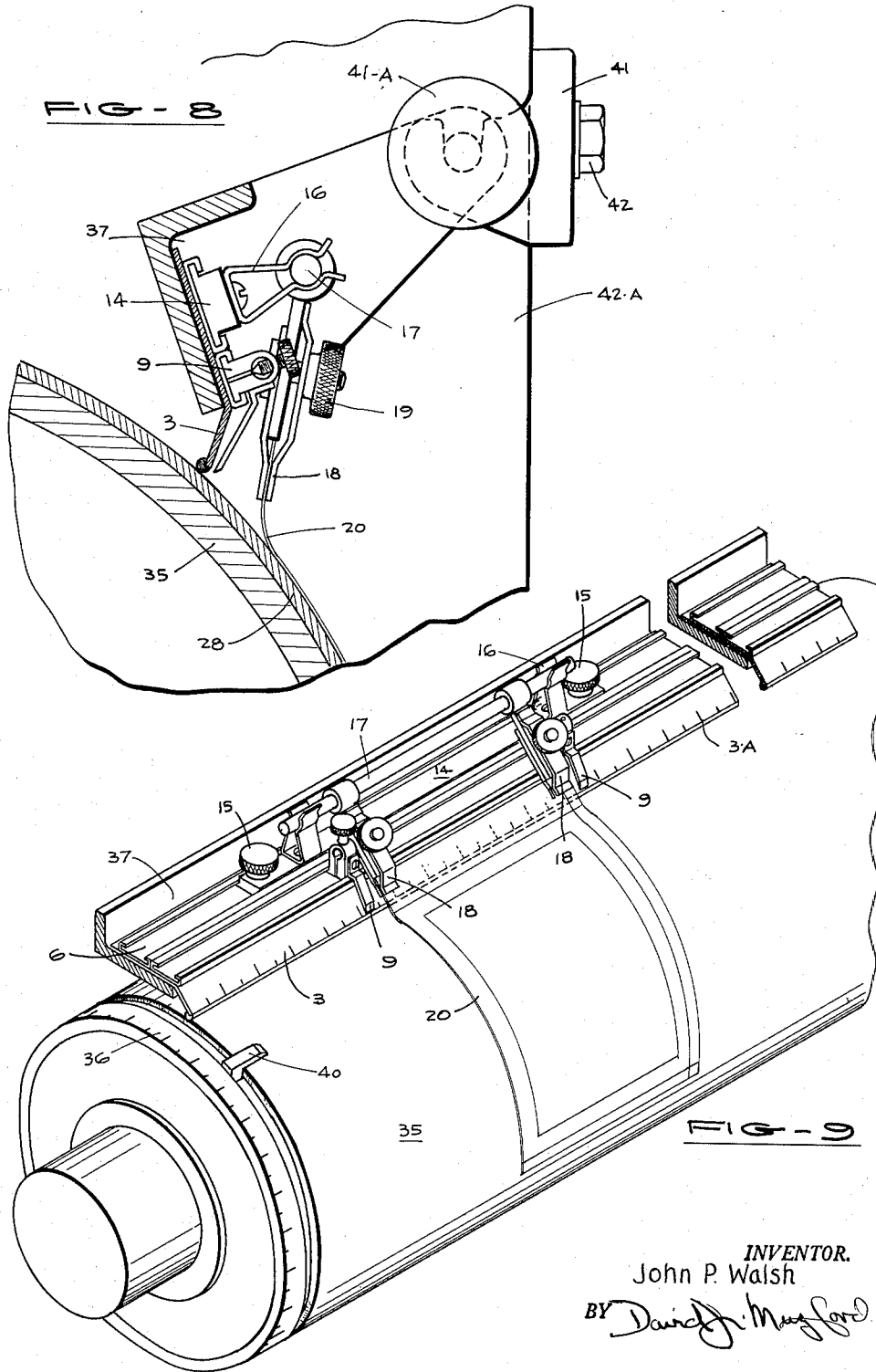
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4 Sheets-Sheet 4



3,206,859

PRINTING APPARATUS

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Filed June 17, 1960, Ser. No. 36,883

18 Claims. (Cl. 33-184.5)

This invention relates to an improved line-up, register and lockup combination frame system for use in the Graphic Arts industry.

In United States Patent 2,100,114, issued November 23, 1937, I described a line-up and register frame. This apparatus was equipped with line-up and register means which enabled one to obtain better printing at lower costs. Over the years it has been apparent to me that the apparatus suffers from several disadvantages. I have now discovered that such disadvantages may be eliminated by means of certain novel improvements which are hereinafter described.

It is an object of my invention to provide an apparatus which can be used either to line up and mark out a sheet of paper or to position and register printing plates when placed in a form.

Another object is to provide an improved combination line-up table and lock-up and register frame which can be employed for step and repeat forms, book work or any other type of form, with correct margins, trims or with whatever instructions are set forth on the operator's job ticket. One or many forms can be made from the same set-up, assuring uniform position on all pages and forms.

Still another object is to provide an apparatus from which one or more color forms can be made once it is set up, speeding up lock-up time and eliminating many of the plate moves now found to be necessary with existing equipment.

In addition, another object is to provide an apparatus which can be employed to lay out and position flat and curved plates on rotary presses and flat bed cylinder presses.

The improved frame can be made in all sizes to fit the needs of any printing operation and can be used as a line-up and register frame in letterpress printing and as a make-up, line-up and stripper table in the offset process. All size forms from the smallest job form to the largest cylinder can be positioned correctly with my system, saving valuable press down-time and turning it into press production time.

These and other objects will be apparent to one skilled in the printing arts from the description of my novel apparatus which is set forth hereinafter.

I accomplish these objectives by providing certain improvements and modifications of the apparatus described by me in United States Patent 2,100,114. Structurally, the apparatus described in said patent was a combination lock-up, line-up and register frame comprised of a frame of graduated rails, a double-edge straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the frame and to be inclined until either edge thereof is on a horizontal plane with the graduated rails of the frame. The apparatus contained means for releasably locking the straight-edge member in its inclined position without preventing the horizontal movement thereof across the frame.

I have now equipped this basic apparatus with position and register gauges on all four sides of the frame, i.e. these gauges may be slidably mounted in the frame rails or they may be mounted to bars which, in turn,

are fastened to and surround the frame, and along the length of the movable straightedge member.

I also provide the straightedge member of the basic frame with a shaft centrally mounted along its length, which shaft contains clamps for attaching a sheet of transparent plastic film thereto, and said clamps containing means for locking them in a manually set position. The transparent plastic film or master film is used as a positive when copy is positioned on the film and the film is marked out for register, and it is used as a negative when positioning printing plates on the case or base.

The position and register gauges can be moved across the straightedge to any position and locked there; and all the printing plates are set in relation to such gauges. The transparent plastic film, which film is hinged to the straightedge by slidably mounted clamps, is brought into position by manually sliding these clamps against the locked position and register gauges of the straightedge. The clamps also are locked in their manually set position. In this position the transparent plastic film may be raised and lowered to allow the operator to position and register the printing plates.

When the frame is fastened to an imposing stone, it is desirable to have one rail of the frame hinged to the frame so that a printer's chase or patent base can be easily positioned on the stone and within frame enclosure by sliding it through the space provided by the removable hinged rail. In my basic apparatus the hinged rail was closed after the chase or base was placed therein and the chase or base was locked against this hinged rail and, as this rail had no support other than its hinges, it would give a little and move the form out of alignment. With my improved apparatus, chase clamps are attached to the front of the imposing stone just clear of the hinged removable rail. The chase or base is secured and locked against these clamps instead of the rail.

A wooden markout board of five-ply maple was used with this apparatus. Such board was heavy and awkward to handle and it would twist and warp making it difficult to use. My improved invention will be equipped with a glass markout board, made in several sizes or sections so that any number of sections can be used depending on the size of the sheet being marked out.

The glass markout board may be made in the form of a table with lighting means contained therein under the glass top. My improved frame may be placed on this lighted table, or on an imposing stone, or anything else on which a user might care to place it.

Also, I have discovered that a single edge straightedge containing the slidably mounted position and register gauges and the slidably mounted sheet of transparent plastic film can be used to advantage in combination with a rotary press wherein the cylinder of the rotary press has a graduated scale at both ends thereof which extends circumferentially around the cylinder.

The accompanying drawings are illustrative of the principles of my invention.

In such drawings:

FIG. 1 is a perspective view of a lock-up frame with position and register gauges slidably mounted on a bar which is attached to and surrounds said frame. Also, it shows double-edged straightedges mounted on the frame.

FIG. 2 is a detailed fragmentary perspective view of a straightedge member which can be moved in both directions and the lock screw to hold said straightedge in a tipped position. Also shown are the position and register gauges and the channels in which they ride and a sheet of transparent plastic film attached to said straightedge by manually movable clamps.

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FIG. 3 is a perspective view of a lock-up frame placed on an imposing stone of an imposing table with either a patent base or chase locked in position inside said frame by means of chase clamps and quoins. Also shown is the front hinged bar of said frame in the down or open position so as to allow the patent base or chase to be inserted or removed from the frame.

FIG. 4 shows a modification of the frame position finger shown in FIG. 1 wherein it is adjustable and is carried by a sliding groove instead of moving along a shaft.

FIG. 5 is a fragmentary perspective of the frame position fingers against which the straightedges are locked when positioning and registering printing plates.

FIG. 6 is a perspective view partially fragmentary showing two uses for my combination lock-up frame. It shows the frame with straightedges and position and register gauges mounted thereon placed on a table, one fragment illustrating its use when the table supports an imposing stone, viz., lining and squaring up printing plates, and the other fragment illustrating its use when placed on a lighted glass top line-up table.

FIG. 7 is a perspective view of a rotary line-up and make-up cylinder with adjustable straightedge and position fingers. It also shows graduated scale at both ends of cylinder in which a channel is cut to allow slidable register fingers to be positioned and locked in place. This rotary line-up cylinder operates much in the same manner as the line-up table in FIG. 6, grippers hold the sheet in position around the cylinder, the straightedge tips up and down to allow the passage of the register fingers. The body of the cylinder can be solid or transparent, with or without lighting equipment. The cylinder heads are made of aluminum or any strong light metal and the body of plastic or any light durable material. The master film is held by clamp fingers and slides along the straightedge channel and is used for the vertical line-up when making out a lay-out and used for positioning and registering copy or pages when making up a dummy.

FIG. 8 is a fragmentary perspective of one of the straightedge brackets attached to the press frame of a rotary press which holds the straightedge in position above the plate cylinder of a rotary press. It also shows film clamp fingers and position gauges.

FIG. 9 is a fragmentary perspective view of a straightedge attachment for use with rotary presses, showing a sheet of transparent plastic film attached to said straightedge and extending over the cylinder. It also shows a graduated scale at one end of the cylinder and extending circumferentially around said cylinder.

Referring now in detail to the embodiment of the invention illustrated in the drawings I have indicated at 21 the top of an imposing stone and at 1 my lock-up frame which is doweled or otherwise fastened on all sides to the top of the imposing stone 21 making it one solid frame. The printer's chase or patent base 23 is locked inside of the frame 1 by means of printer quoins 25 and chase clamps 24 and lock screws 24A for said clamps.

The printing plates 28 are placed inside the chase or on patent base 23 and lined up and positioned by means of straightedges 3 which come in contact with position gauges 7 which are positioned around the lock-up frame 1 by the stoneman from the layout information with his job ticket.

Heretofore the usual procedure has been to lock up the printing plates 28 of various sizes in a chase or on a patent base 23 without the use of a positive guide or mechanism to indicate the correct position or alignment of each printing plate. With the use of the position gauges 7 and on both the frame 1 and straightedge 3 and the master film 20 the stoneman lays out the entire form according to his instructions, eliminating the

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guesswork procedure and improving the precision and accuracy when lining up printing plates 28 is a form.

The straightedges 3 are graduated 3A on both edges and carry channels 6 which allow the position gauges 9 and film clamp fingers 18 to slide from one position to another which makes it possible to line up and space accurately in both directions at the same time.

The lock-up frame 1 is graduated 1A on all four sides as indicated at 1 and the graduations 3A of the straightedges 3 may be read with reference to the graduated rails of the frame.

In FIG. 2 I show the straightedge 3 with a shaft 17 mounted in clamp finger shaft holders 16 along the length of the straightedge 3. The clamp finger shaft 17 contains clamps 18 with lock screw 19 for attaching the master film 20 thereto. Master film 20 may be positioned by means of a slide bar 14 and locked in position with the slide bar lock screw 15.

Position and register gauges 7 are slidably mounted on a bar 7A and are attached to and surround the frame 1.

The gear racks 2 for the pinions 4 and the straightedges 3 are located in the frame 1 and are gibbed to prevent any side play. The straightedge shafts 11 and their pinions 4 are provided with knobs 5 by means of which the straightedges 3 may be conveniently moved back and forth over the form or printing plates 28. The straightedges 3 are provided with a clamp 12 and lock screw 13 which locks the pinion shaft 11 and keeps the straightedge 3 from rolling along the rack 2. In this position it is possible for the stoneman to tip the straightedge 3 up and down without losing its original position.

The lock-up frame 1 has a hinged front bar 26 which is operated by stud and bracket 26A. This allows the bar 26 to drop below the surface of the imposing stone 21 so that the chase or form 23 may be slid on or off the imposing stone 21 after the chase clamps 24 are released and lowered.

When using the lock-up frame 1 to make a lay-out on a sheet of paper or make up a dummy, I replace the chase 23 with a glass top mark-out board 28A inside the lock-up frame 1 and clamp the sheet to be marked out upon the glass top 28A by means of hold down finger gauges 29A. The gauges 29A are attached to a grooved bar 26. The gauges 29A may be slid manually along the bar and may be placed in any desired position on the sheet to be marked out. The gauges 29A are fastened on the sheet of paper by means of lock screws.

In FIG. 6 I show a two-way partial view of my lock-up frame 1 in one section being used on an imposing table 22 and being used to mark out a sheet of paper on a glass mark out board 28A being held by gauge fingers 29A. In the other section the line-up frame is positioned on top of a glass top line-up table 29 containing a light 30 within, which table is used as a lighted line-up table in the letterpress printing plants and as a line-up, make-up and stripper table in the offset plants. In FIG. 7 I show a rotary line-up and make-up cylinder 35 which rides cylinder bearings on cylinder frame 33 equipped with straightedge 37 which carries channel 6 in which the position gauges 9, film clamp fingers 18 and master film 20 slide along the straightedge 37. The cylinder is rotated by hand from either of the cylinder heads 34 and the cylinder is equipped with grooved graduated scales 36 on which the cylinder position gauges 40 slide and are positioned and moved up to the straightedge 37 where the cylinder 35 is locked in position by the lock screw 43. The straightedge 37 may be raised and lowered manually by means of knobbed lock nut 39 to allow the passage of the cylinder position gauges 40 and is locked in position by lock screw 38 while in contact with the cylinder position gauges 40. Straightedge 37 is equipped with film clamp fingers 18 which hold and

position master film 20 and carry it from one position to another along the length of the straightedge 37.

In FIG. 8 I show one of the brackets 41 that holds the straightedge 37 to a rotary press frame and the bolt 42 that holds it secure. I also show the straightedge 37 and the locknut 41A which keeps it in position. In FIG. 9 I show a straightedge 37 with position gauges 9 and film clamp fingers 18 holding master film 20 over printing plate cylinder 35 while positioning printing plate to said cylinder 35.

It is apparent to those skilled in the art that my improved combination lock-up and line-up frame and register system can be used in lining, squaring, positioning and registering printing plates in a chase on either patent base or an imposing stone, or grooved plate cylinders for flat bed presses or rotary press plate cylinders by means of a graduated frame and straightedges equipped with position and register gauges and a master film. This same frame and straightedge with the position and register gauges and master film may be placed on a lighted glass top table and used as a line-up table in letterpress printing plants, when marking out a layout on a worksheet and as a line-up, make-up and stripper table in offset printing plants and for step and repeat forms, book work or any other type form, with correct margins, trim or whatever instructions are set forth on the stoneman's job ticket. This is accomplished by laying out the frame and straightedges with the position and register gauges in their correct position and then using the master film which has been laid out for register and position, said master film traveling the length of the straightedge channel and positioned between the position and register gauges to correctly position and register printing plates in their correct position.

A complete job of one or more pages, one or more forms and one or more colors can be made from the original frame set-up assuring uniform position and register on all pages and forms.

Equipping my apparatus with position and register gauges and master film makes it possible to lineup and register one and two color forms at the same time for one and two color presses once the frame and straightedges are laid out and positioned with the position and register gauges and master film. The master film once it is laid out for position is used to position all printing plates in the form or forms.

A rotary line-up and make-up cylinder is equipped with a grooved graduated scale on both ends to allow position gauges to be set and locked in position, grippers to hold the sheet and carry it around the cylinder and a lockscrew to hold it in position. A straightedge is equipped with graduated scale which carries channels to allow position gauges to slide into position and be locked. Also a slide bar and clamp fingers to carry master film is employed. The straightedge is used when marking out the horizontal lines and the master film to mark the vertical lines.

A combination straightedge and position bar which has a graduated scale and which is grooved to carry position gauges and master film is secured by a bracket to the press frame in order to position said bar in a position above the plate cylinder. The plate cylinder is equipped with a graduated scale on each end of the cylinder which scale is grooved to allow position gauges to slide and lock into position.

It may also be apparent to those skilled in the printing arts that a transparent plastic film cut to the untrimmed size of any single page of a book or job showing complete information and lay-out of a single page is all that is necessary to lay out one or more pages, one or more forms of a complete job when used with the lock-up, line-up and register frame system. This master film is clamped in fingers attached to the straightedge. The master film is used as a positive when using copy and as a negative when positioning printing plates to a form or patent base or grooved plate cylinder on a rotary press.

When position is approved on the master film, register marks are traced on the master film in as many colors as the job requires. The master film is then placed over the printing plate in registered position and placed into correct position on patent base.

The master film is positioned between the position and register fingers on the straightedge and positioned on the printing plate. In this position the master film is raised and lowered to allow the stoneman to position and register the printing plates.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. An apparatus to be employed as a combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, one rail of which is removable so that a printer's chase can be positioned within the frame enclosure, a printer's chase member positioned on the imposing stone and within the frame a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with the chase, and lock means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which comprises the use of such apparatus in combination with chase clamps against which the chase member is secured and locked, said clamps being fastened to the imposing stone just clear and to the inside of the removable graduated rail.

2. A combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, said frame being in enclosing relation to a glass top mark out board with lighting means contained therein, a double-edged straight-edge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straight-edge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with glass top mark out board, and lock screw means for releasably locking said straight-edge member in its inclined position thereby preventing the horizontal movement thereof across the frame, said straight-edge member additionally containing a shaft centrally mounted along its length containing slidably mounted clamps for attaching a sheet of transparent plastic film thereto and means for locking said clamping means in a manually set position, and position and register gauges slidably mounted both along the length of the straight-edge member and along the length of each of the graduated rails of the frame.

3. A combination lock-up and line up frame and register system comprising a frame of graduated rails, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the frame and to be inclined until either edge thereof is on a horizontal plane with the graduated rails of the frame, and lock screw means for releasably locking said straight-edge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which is the use of such apparatus in combination with position and register gauges which are slidably mounted to bars which, in turn, are fastened to and surround the frame.

4. A combination lock-up and line up frame and register system comprising a frame of graduated rails, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with refer-

ence to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the frame and to be inclined until either edge thereof is on a horizontal plane with the graduated rails of the frame, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which is the use of such apparatus in combination with position and registered gauges which are slidably mounted along the length of the movable straightedge member and along each graduated rail of the frame.

5. A combination lock-up and line up frame and register system comprising a frame of graduated rails, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the frame and to be inclined until either edge thereof is on a horizontal plane with the graduated rails of the frame, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which is the use of such apparatus in combination with (1) position and register gauges which are slidably mounted along the length of the movable straightedge member and along each graduated rail of the frame, (2) a shaft centrally mounted along the length of the straightedge member containing slidably mounted clamps for attaching a sheet of transparent plastic film thereto, and (3) means for locking said clamps in a manually set position.

6. A combination lock-up and line up frame and register system comprising a frame of graduated rails, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the frame and to be inclined until either edge thereof is on a horizontal plane with the graduated rails of the frame, and lock screw means for releasably locking straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which is the use of such apparatus in combination with (1) position and register gauges which are slidably mounted along the length of the movable straightedge member along each graduated rail of the frame, (2) a shaft centrally mounted along the length of the straightedge member containing slidably mounted clamps, and (3) a sheet of transparent plastic film one edge of which is secured to the movable straightedge member by said clamps.

7. A combination lock-up and line up frame and register system comprising a frame of graduated rails, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the frame and to be inclined until either edge thereof is on a horizontal plane with the graduated rails of the frame, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which is the use of such apparatus in combination with (1) position and register gauges which are slidably mounted along the length of the movable straightedge member and along each graduated rail of the frame, (2) a shaft centrally mounted along the length of the straightedge member containing slidably mounted clamps, (3) a sheet of transparent plastic film one edge of which is secured to the movable straightedge member by said clamps, and (4) a glass top line-up table with lighting means contained therein, the table top being of a size in

relation to the frame of graduated rails that permits said frame to be in enclosing relation thereto.

8. An apparatus to be employed as a combination lock-up and line-up frame and register system comprising a frame of graduated rails fastened to an imposing stone, said frame being in enclosing relation to a printer's chase, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with the chase, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which is the use of such apparatus in combination with position and register gauges which are slidably mounted to bars which, in turn, are fastened to and surround the frame.

9. An apparatus to be employed as a combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, said frame being in enclosing relation to a printer's chase, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with the chase, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which is the use of such apparatus in combination with position and register gauges slidably mounted along the length of the movable straightedge member and along each graduated rail of the frame.

10. An apparatus to be employed as a combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, said frame being in enclosing relation to a printer's chase a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with the chase, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which is the use of such apparatus in combination with (1) position and register gauges slidably mounted along the length of the movable straightedge member and along each graduated rail of the frame (2) a shaft centrally mounted along the length of the straightedge member containing slidably mounted clamps for a sheet of transparent plastic film, and (3) means for locking said clamps in a manually set position.

11. An apparatus to be employed as a combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, said frame being in enclosing relation to a printer's chase, a double edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with the chase, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which is the use of such apparatus in combina-

tion with (1) position and register gauges which are slidably mounted along the length of the movable straightedge member and along each of the graduated rails of the frame, (2) a shaft centrally mounted along the length of the straightedge member containing slidably mounted clamps, and (3) a sheet of transparent plastic film one edge of which is secured to the movable straightedge member by said clamps, said film being used as a negative when positioning and registering printing plates within the frame.

12. An apparatus to be employed as a combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, one rail of which is removable so that a printer's chase can be positioned within the frame enclosure, a printer's chase positioned on the imposing stone and within the frame, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with the chase, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which comprises the use of such apparatus in combination with (1) chase clamps against which the chase member is secured and locked, said clamps being fastened to the imposing stone just clear and to the inside of the removable graduated rail, and (2) position and register gauges which are slidably mounted along each of the graduated rails of the frame.

13. An apparatus to be employed as a combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, one rail of which is removable so that a printer's chase can be positioned within the frame enclosure, a printer's chase member positioned on the imposing stone and with the frame, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with the chase, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which comprises the use of such apparatus in combination with (1) chase clamps against which the chase member is secured and locked, said clamps being fastened to the imposing stone just clear and to the inside of the removable graduated rail, and (2) position and register gauges which are slidably mounted to bars, which bars, in turn, are fastened to and surround said frame.

14. An apparatus to be employed as a combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, one rail of which is removable so that a printer's chase can be positioned within the frame enclosure, a printer's chase member positioned on the imposing stone and within the frame, a double-edge straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with the chase, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which comprises the use of such apparatus in combination with (1) chase clamps against which

the chase member is secured and locked, said clamps being fastened to the imposing stone just clear and to the inside of the removable graduated rail, and (2) position and register gauges which are slidably mounted along the length of the movable straightedge member and along each of the graduated rails of the frame.

15. An apparatus to be employed as a combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, one rail of which is removable so that a printer's chase can be positioned within the frame enclosure, a printer's chase member positioned on the imposing stone and within the frame, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with the chase, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which comprises the use of such apparatus in combination with (1) chase clamps against which the chase member is secured and locked, said clamps being fastened to the imposing stone just clear and to the inside of the removable graduated rail, (2) position and register gauges which are slidably mounted along the length of the movable straightedge member and along each of the graduated rails of the frame, and (3) a shaft centrally mounted along the length of the straightedge member containing slidably mounted clamps for a sheet of transparent plastic film, and means for locking said clamps in a manually set position.

16. An apparatus to be employed as a combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, one rail of which is removable so that a printer's chase can be positioned within the frame enclosure, a printer's chase member positioned on the imposing stone and within the frame, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across the surface of the frame and to be inclined until either edge thereof makes intimate contact with the chase, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which comprises the use of such apparatus in combination with (1) chase clamps against which the chase member is secured and locked, said clamps being fastened to the imposing stone just clear and to the inside of the removable graduated rail, (2) position and register gauges which are slidably mounted along the length of the movable straightedge member and along the length of each of the graduated rails of the frame, (3) a shaft centrally mounted along the length of the straightedge member containing slidably mounted clamps and (4) a sheet of transparent plastic film one edge of which is secured to the movable straightedge member by said clamps, said film being used as a negative when positioning and registering printing plates within the frame.

17. An apparatus to be employed as a combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, one rail of which is removable so that a patent base can be positioned within the frame enclosure, a patent base member positioned on the imposing stone within the frame, a double-edged straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on said frame in a manner permitting said member to be moved across

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the surface of the frame and to be inclined until either edge thereof makes intimate contact with the patent base, and lock screw means for releasably locking said straight-edge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, the improvement of which comprises the use of such apparatus in combination with (1) patent base clamps against which the patent base member is secured and locked, said clamps being fastened to the imposing stone just clear and to the inside of the removable graduated rail, (2) position and register gauges which are slidably mounted along the length of the movable straightedge member and along each of the graduated rails of the frame, (3) a shaft centrally mounted along the length of the straightedge member containing slidably mounted clamps, and (4) a sheet of transparent plastic film one edge of which is secured to the movable straightedge member by said clamps, said film being used as a negative when positioning and registering printing plates within the frame.

18. A combination lock-up and line up frame and register system comprising a frame of graduated rails fastened to an imposing stone, said frame being in enclosing relation to a glass top mark-out board with lighting means contained therein, a double-edge straightedge member having graduations on both edges thereof, which graduations are readable with reference to the graduated rails of the frame, the straightedge member being mounted on

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said frame in a manner permitting said member to be moved across the frame and to be inclined until either edge thereof makes intimate contact with the glass top mark-out board, and lock screw means for releasably locking said straightedge member in its inclined position, thereby preventing the horizontal movement thereof across the frame, said straightedge member additionally containing a shaft centrally mounted along its length containing slidably mounted clamps, a sheet of transparent plastic film one edge of which is secured to the movable straightedge member by said clamps, said film being used as a positive when copy is being positioned on the film and when said film is being marked out for register, and position and register gauges slidably mounted along the length of the straightedge member and along the length of each of the graduated rails of the frame.

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