

C. A. STURTEVANT.

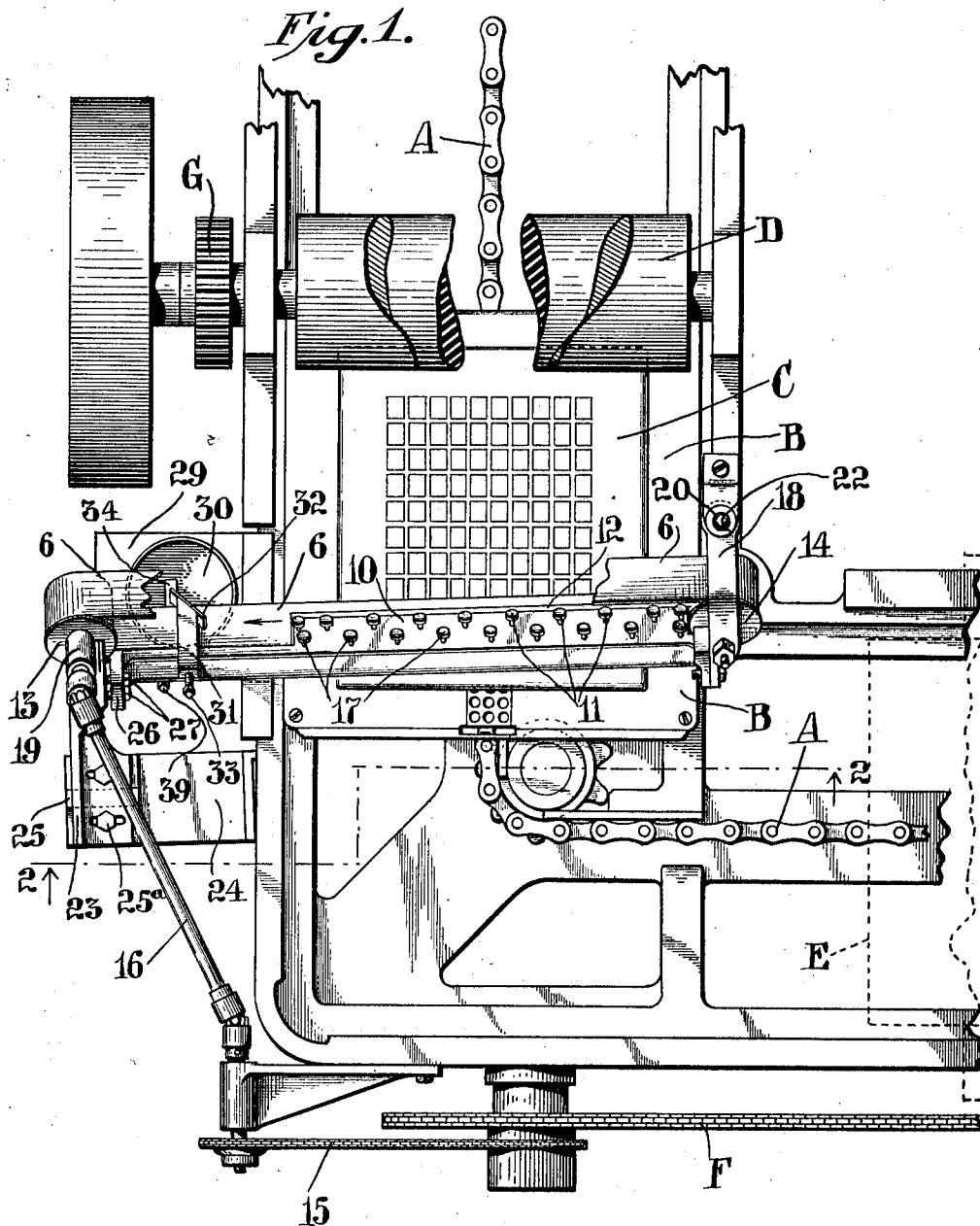
PRINTING PRESS.

APPLICATION FILED OCT. 19, 1909.

1,026,934.

Patented May 21, 1912.

3 SHEETS—SHEET 1.



Attest:
P. J. Wening
P. J. Wening

Charles A. Sturtevant Inventor:
by *Graux P. Wentworth*
his Atty.

Fig. 2.

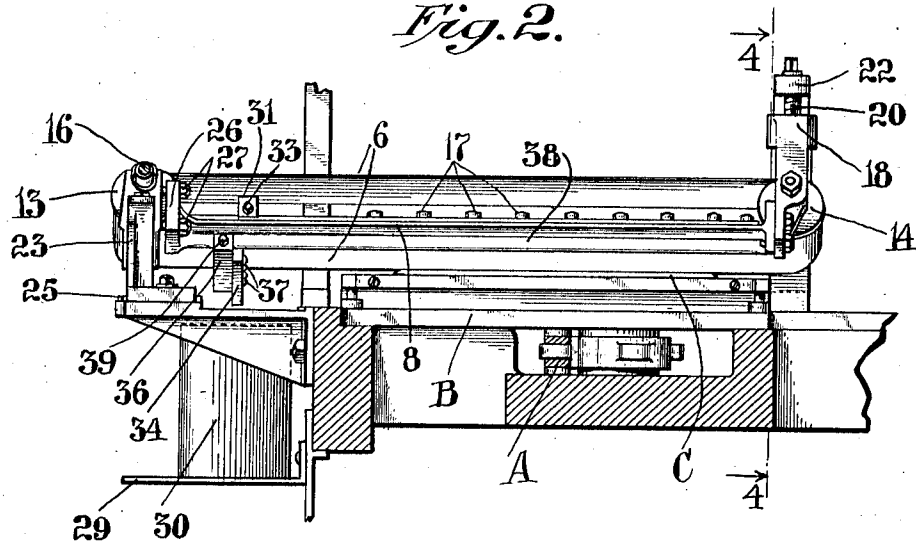


Fig. 3.

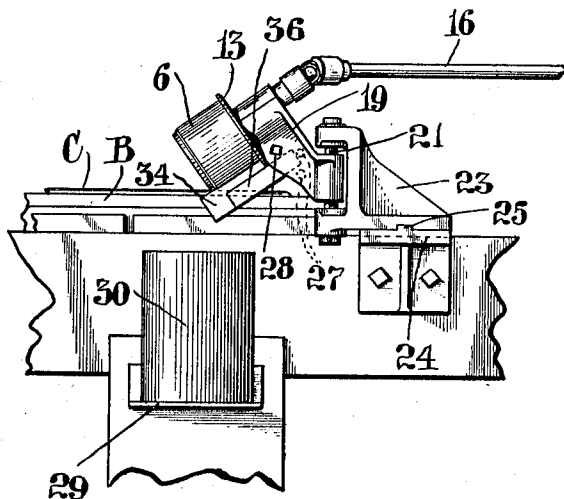
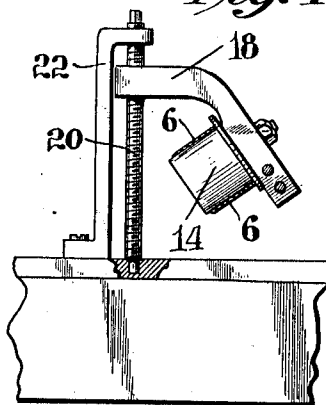


Fig. 4.



Attest:
P. V. Wining

Charles A. Sturtevant Inventor:
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3 SHEETS-SHEET 3.

Fig. 5.

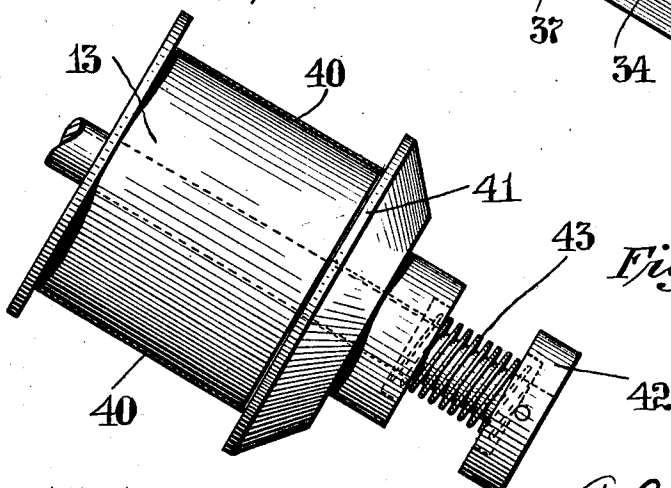
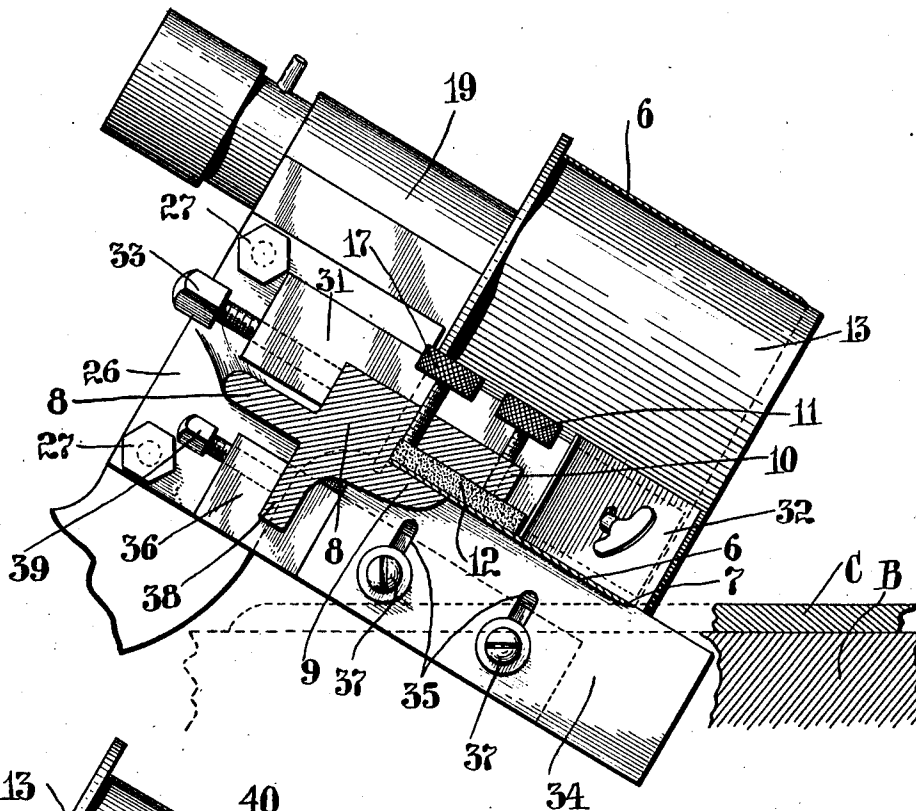


Fig. 6.

Attest:
P. F. Werning
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UNITED STATES PATENT OFFICE.

CHARLES A. STURTEVANT, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO AMERICAN BANK NOTE COMPANY, A CORPORATION OF NEW YORK.

PRINTING-PRESS.

1,026,934.

Specification of Letters Patent.

Patented May 21, 1912.

Application filed October 19, 1909. Serial No. 523,495.

To all whom it may concern:

Be it known that I, CHARLES A. STURTEVANT, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to printing presses and more particularly to an ink removing attachment for under surface or plate printing presses.

In printing from intaglio or engraved plates, the ink is applied to the entire surface of the plate, and the ink subsequently removed from the plate surface leaving only that ink deposited by the inking rollers in the intaglio cuts, for printing purposes. As the plate surface from which the ink is wiped constitutes by far the greater part of the plate, and as ordinarily this ink is removed by means of absorbent cloths, the greater part of the ink applied to the plate is lost in the wiping process, as no successful, practical means of recovering this ink have been devised. Various expedients to effect a saving of this ink have heretofore been suggested, such as surfacing the plate with an ink resisting coating, excepting in the intaglio lines, or removing the ink, by a suitable solution, from the wiping cloths. Neither of these methods has met with such practical success as to go into use, inasmuch as the method first above suggested would not entirely resist the depositing of ink thereon and the ink resisting coating would gradually wear in places so as to cause a streaking of the imprints. The second method above suggested is faulty inasmuch as the solvent for removing the ink would enter into the ink composition and could not be eradicated to an extent to produce ink of the required quality. Ink for engraving is composed of oil and a coloring pigment and the application of solvents to the ink would affect both the oil and the coloring matter and furthermore would recover but a small percentage of the ink retained in the wiping cloths.

The main object of the present invention is to provide a printing press for under-surface printing wherein the ink deposited upon the plate by the inking rollers will, as to that ink deposited upon the surface of the plate as distinguished from that deposited in the intaglio cuts, be removed by a non-absorbent agent in continuous engagement with the plate; and be conveyed by said agent from adjacent to the plate and accumulated or collected in a manner to be again used in the ink fonts without the necessity for employing any chemical agents.

A further object is to provide a non-absorbent ink remover which, while in engagement with the plate, will have such movement relative thereto as to not only prevent the streaking of the plate, but avoid such an accumulation of ink upon the scraper as would limit its capacity for taking up ink.

A still further object is to provide a scraper adapted to remove surface ink from an intaglio plate, or the major portion of such ink, without subjecting the plate to such wear and tear as would tend to deface it in any way.

A still further object is to provide a scraper, different portions of which may be adjusted toward or from the plate to compensate for irregularities in the surface, or to adjust the scraper so as to adapt it for use upon different plates.

A still further object is to provide a continuously acting scraper having a substantially constant relation to the plate being scraped.

A still further object is to provide a scraper which is adapted to bear upon the plate, and present a narrow edge thereto in a manner to cause the ink upon the upper surface of the plate to be forced by the movement of the plate, upon said scraper.

A still further object is to provide a scraper having a narrow edge as above referred to, which scraper may be adjusted in its entirety toward and from the bed plate to secure its proper positioning relative to the plate or plates from which the ink is to be removed.

A still further object is to provide in a printing press, a mechanism for removing

ink from the upper surface of the plate which mechanism will consist of an endless scraper moving transversely across the path of the plate being wiped.

5 A still further object is to provide a transversely moving scraper as above referred to wherein the driving mechanism will be controlled from the main power mechanism of the press so as to cause said scraper mechanism to act synchronously with the press
10 power mechanism.

A still further object is to provide in a printing press a flexible, non-absorbent scraper so presented toward the plate as to
15 cause the ink to be removed by a continuous rubbing action, thus avoiding the scratching of the surface of the plate by said scraper, and at the same time, causing the ink to be removed therefrom with substantial uniformity throughout the plate, and without
20 streaking the plate in a manner to cause the cloths used in the subsequent wiping and polishing of the plate to become irregularly soiled.

25 A still further object is to provide in a printing press an endless scraper for removing the superficial ink from the plate, wherein the ink accumulated upon the scraper will be removed therefrom in a manner to permit the continuous operation of
30 the scraper and avoid the fouling of the carrier for said scraper by the ink.

A still further object is to provide a flexible traveling scraper adapted to bear upon
35 the plate being wiped, the portion of said scraper co-incidental with the dimensions of the plate being scraped, being reinforced or stiffened in a manner to secure the desired intimate relation of the scraper and plate, while at the same time permitting that
40 slight flexibility necessary to permit the scraper to adapt itself to irregularities in the thickness of different plates or different bed plates.

45 A still further object is to provide carriers for the flexible scraper which will be so constructed and arranged as to absorb the stresses placed upon the scraper by the movement of the plate.

50 A still further object is to provide means in conjunction with the stiffening or reinforcing means adjacent to the area of contact between the scraper and the plate, whereby the contacting portion of the
55 scraper may be adjusted toward and from the plate as desired, and such adjustment will be accomplished without a sharp change from the plane of movement of the scraper as an entirety.

60 A still further object is to provide in a printing press having an endless scraper continuously moving transversely of the plate about parallel rollers or rollers rotating about parallel axes, wherein various adjustments will be provided for taking up

slack in said scraper, preventing the escape of said scraper from its rollers, and controlling the relation between said scraper and the surface of the plate having the ink removed therefrom.

70 A still further object is to provide in a printing press a scraper which will accumulate the ink upon a portion thereof, not in surface contact with the plate, thus insuring uniformity in the removal of the ink and in the operation by the scraper upon all portions of the plate.

A still further object is to provide a scraper for removing the ink from the plates used in under-surface printing presses
80 which will be equally adapted for use upon flat bed or cylinder presses. And a still further object is to provide in a printing press for under-surface printing, a scraping mechanism for removing the ink from the
85 upper surface of the plate or plates, which mechanism will be simple in design and will serve to recover in its original condition, the ink deposited upon the said top surface of the plates.

90 The invention consists in such novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

95 Referring to the drawings:—Figure 1 is a plan view of a portion of a flat bed printing press employing my invention; Fig. 2 is a vertical section on the lines 2—2 of Fig. 1, with the inking mechanism removed; Fig. 3 is a side view thereof; Fig. 4 is a section on the lines 4—4 of Fig. 2, Fig. 5 is a vertical
100 section of the scraper mechanism on an enlarged scale, and Fig. 6 is a similar view of a modified form of scraper with its sharpening means.

105 Like letters refer to like parts throughout the several views.

In the embodiment of my invention shown in the accompanying drawings, I
110 have shown it as being applied to a well known type of flat bed under surface printing press, in which the said bed moves continuously about a rectangular course, the process of printing being divided into four
115 steps, inking on one side of the parallelogram; wiping and polishing on another; feeding on a third; and taking the imprint and collecting on the fourth. It is not my intention, however, to limit the invention to
120 use in connection with a flat bed press or with the particular type of press shown in the drawings.

Inasmuch as this invention relates more particularly to the mechanism for accomplishing the removal of the ink from the upper surface of the plate, I have shown only that portion of the press incidental to the carrying out of this step.

125 In the drawings, I have shown at A the

chain and sprocket driving mechanism for the bed B upon which the engraved, or intaglio, printing plate C is mounted in any desired manner. Mounted above the bed B is any suitable system of inking rollers, D adapted to ink the plate C. The bed B is merely one of a plurality of beds propelled by the chain drive A. At E, I have indicated in dotted lines a conventional wiping mechanism to more clearly establish and define the relation of the various elements used in wiping and polishing the plate or plates C. A portion of the transmission mechanism driving the chain A is shown at F, and a portion of the driving mechanism for the inking rollers is shown at G.

The wiping and polishing mechanism E ordinarily consists of a strip or pad of absorbent material coming into contact with the upper surface of the plate C and removing the ink therefrom through capillary action simultaneously with and subsequently to, the rubbing action of the wiper on the plate. Hence the entire volume of ink deposited on the upper surface of the plate C has heretofore been removed, (by absorption) by the wiper E, with a resultant rapid fouling of the wiper by such ink, and a rapid consumption of the absorbent material of the wiper owing to the necessity for frequent changes to avoid streaking of the plate when the cloth had absorbed a considerable quantity of the ink. Incidentally the stoppage of the press to permit the changing of cloths resulted in a diminution of the output of the press.

To avoid the losses (in ink, time and imperfect work) due to the removal of the ink by means solely of absorbent wipers, I provide a non-absorbent scraper 6 adapted to engage and bear upon the upper surface of the plate in a manner to cause the forward feeding movement of this plate to deposit the greater portion of the ink deposited thereon, upon said scraper. This scraper is not intended to fully accomplish the wiping and polishing of the plate, but merely to remove as large a quantity of ink from the upper surface as possible, with the twofold object of effecting a saving of this ink and avoiding a rapid fouling of the wiper and polishing cloths. The scraper 6 projects downwardly at an angle to the plane of the plate C and is in lineal engagement therewith throughout the entire width of the plate, thus causing the movement of said plate to deposit the ink continuously and uniformly upon said scraper and avoiding the streaking of the plate owing to any intervals of disengagement of the scraper from said plate. To insure that intimate contact of this scraper 6 with the upper surface of the plate C necessary to prevent the escape of any substantial quantity of ink beneath said scraper, I preferably bevel the under

surface of the said scraper, as indicated at 7. This bevel not only permits the edge of the scraper to be brought down into close proximity to the surface of the plate, but also presents a plane surface adapted to bear directly upon said surface, and thus avoid a scratching of the top surface through the engagement therewith of a sharp edge. While in practice it is sought to avoid irregularities in the surface of the plate C, such sometimes occur; and to permit the scraper to automatically adjust itself to all portions of the plate, or to different plates on the same press, I preferably make it of flexible material, such as strip steel. To avoid the displacement or distortion of the scraper by the movement of the plate, from which the ink is being removed, relative thereto, I provide a rigid back 8 having a channel therein in which the rear edge of the scraper 6 is seated, said channel being of a depth to cause the opposite sides 9 and 10 thereof to impart rigidity to that portion of the scraper within same, the bottom of said channel serving to absorb the longitudinal strains on the scraper.

In removing ink from plates, it is found that some portions of the plates (to secure the desired quality of work,) need not be scraped as closely as other parts, to meet which condition I provide means varying the plane of different portions of the same scraper. This means preferably consists of a plurality of adjustment screws 11 adjacent to the free edge of the side 10 of the back 8, said screws being arranged within the operative area of the scraper at suitable distances apart to permit a variance in the position of the edge of the scraper at substantially any point of the operative portion thereof. To avoid an abrupt change of the plane, or a change through a limited area by the adjustment of only one screw, I interpose a thick, flexible member 12 preferably a leather strip, between the adjusting screws 11 and the scraper 6, said member being common to all said screws. This construction causes a gradual change of the plane of the scraper and a gradual return to the original plane, the affected portion covering a considerable area as compared with that which would follow from the use of the screw alone. This manner of varying the contact plane of the scraper necessitates inequality in the depth of the sides 9 and 10, the upper flange being the deeper for the twofold purpose of permitting more convenient access to the adjusting means, and of preventing the buckling of the flexible scraper upwardly, which would be the natural tendency. The scraper 6, it will be observed, is in continuous engagement with the plate C from which the ink is being removed, and to make said scraper more effective in removing the ink, I impart to it, in a

manner more fully described hereinafter, a movement transversely of the direction of movement of the bed while in engagement therewith. With a flat bed, such as is shown in the accompanying drawings, the scraper is extended diagonally across the plate, the pitch being very slight, this arrangement serving to more effectively take up and collect the ink from the surface of the plate, the movement of the scraper supplementing that of the plate itself in this operation.

The movement of the plate C, relative to the scraper 6, deposits upon said scraper, the ink upon the upper surface of said plate, or a large portion thereof, thus necessitating, to permit an extensive run of the press, a structure wherein the ink accumulated upon the scraper, will be removed. The scraper being non-absorbent, the ink deposited thereon will retain all of its original properties and be in condition for use without subsequent treatment.

To accomplish the removal of the ink from the scraper 6, I take advantage of the traverse of said scraper, and to make the operation of the scraper and of the ink removing means acting in conjunction therewith continuous, I make said scraper in the form of an endless metallic band passing around the pulleys 13 and 14, one of which pulleys as 13 is driven from the main power mechanism F by the chain and sprocket mechanism 15 and the universal driving rod 16, connected with the shaft of said pulley. Any other desired or approved driving mechanism may be used, however, the universal driving rod above referred to being used merely because of its adaptability in permitting those slight adjustments of the driver for the scraper belt, incidental to this mechanism, which adjustments will be hereinafter referred to. The said scraper belt 6 passes between the member 12 and the flange 9 of the back 8 and to insure said belt being held perfectly taut as to the operative portion thereof at any moment, I arrange a plurality of pressure screws 17 passing through the side 10 adjacent to the bottom of the channel, and bearing upon said member 12, a plurality of said pressure screws 17 being used to insure a uniform resistance to the passage of the belt at all points adjacent to the back.

To permit the vertical adjustment of the pulleys 13 and 14 carrying the scraper belt 6, I mount these pulleys in traveler frames 18 and 19 which frames are mounted upon vertical screws 20 and 21 carried by suitable brackets 22 and 23 respectively. One of these brackets, as 23, is adjustably mounted upon a support 24 by means of a horizontal way 25, and set screws 25^a passing through elongated slots in the base of said bracket 23, which screws are used to lock the bracket, and the parts supported thereby, in the ad-

justed position. This adjustment may be used to tauten the scraper 6 and take up any slack which may develop therein.

The screws 20 and 21 in addition to their function of accomplishing a vertical adjustment of the scraper so as to position it in the proper plane, serve as pivotal supports for the frames 18 and 19, carrying the pulleys 13 and 14, thus permitting a slight rotary movement of these frames for the purpose of shifting the axes of the rollers 13 and 14 and tautening the scraper belt adjacent to the operative edge thereof only. This adjustment is accomplished through the agency of the back 8 which back is secured at one end thereof to the end of the frame 18 by which it is supported. The other end of this back carries a flange 26 substantially parallel with the frame 19 which flange carries adjusting screws 27 bearing upon said frame and adapted to simultaneously turn both frames 18 and 19 in opposite directions to cause a similar but unequal shifting of the arbors of the pulleys 13 and 14. A third adjusting screw 38 acts from the other side of the frame 19 for the purpose of setting the frames 18 and 19 and the pulleys mounted therein in the adjusted position. The inequality in the amount of movement of the pulleys 13 and 14 accomplishing this adjustment, results in a slight increase in the distance between the axes at the lower faces of these pulleys, causing a spreading thereof along the line of the contact edge of the scraper belt 6.

Below and adjacent to the pulley 13, which pulley is at the delivery end of the scraper 6, is a support 29 for a collecting receptacle 30 adapted to receive the ink as it is delivered by the scraper 6.

Mounted upon the back 8 above the receptacle support 29, is a block 31 bearing upon the top of the lower reach of the scraper 6. Carried by this block is a supplemental scraper plate 32 extending diagonally across the lower part of said scraper 6. This plate 32 is removably attached to the block 31 to permit its removal for purposes of cleaning. Said plate 32 is for the purpose of accumulating ink collected upon the scraper 6 as said scraper is fed under said plate by the pulley 13, and delivering it to the receptacle 30. The sides 9 and 10 of the back 8 terminate at a point between said scraper 32 and the operative edge of the said scraper 6 for the purpose of leaving clearance for this supplemental scraper mechanism. The block 31 straddles the back 8 so as to be capable of sliding thereon for purposes of adjustment, the set screw 33 being provided for locking said block and said supplemental scraper 32 in any desired position. Beyond the block 31 and between it and the pulley 13 is a wooden backing plate 34 forming an under bearing for the

scraper 6. The upper face of this backing block 34 is cut away to conform to the scraper 6 and the operative edge thereof, and the supplemental scraper plate 32 bears upon said scraper 6 with the outer end of said plate 32 bearing upon said block 34. This construction prevents the escape of ink beneath the plate 32 as the scraper 6 is loosely clamped between said plate 32 and said block 34. The block 34 is provided with a plurality of vertically elongated slots 35 by means of which it is adjustably secured to a metallic block 36 by means of the screws 37. The block 36 is mounted upon a pendant flange 38 of the back 8 by means of a slot therein and a set screw 39, thus permitting an adjustment of the block 36 corresponding to that of the block 31.

In the modification shown in Fig. 6 the construction differs from that of the preferred form merely in those details pertaining to the scraper belt 6. In this form of the invention instead of using a belt having a beveled operative edge, I use a straight scraper belt 40 made of stock sufficiently thin to avoid a shoulder of any substantial height when this edge bears upon the plate C. This form of belt has the disadvantage of requiring very thin metallic stock, but has the advantage of securing a sharper, or more limited contact between the operative edge of the belt and the plate, avoiding to a certain extent the escape of ink under the belt at different points, resulting in streaking. In scraping the ink from the plate, it is desirable to leave a small quantity of ink to cause the wiping cloth to become soiled sufficiently to "pack" ink into the intaglio cuts; but an unequal distribution of ink upon the plate may result in an unequal fouling of the cloth with a resultant mottled appearance of the imprint.

When I use a square edge scraper belt, I make it slightly wider than the pulleys 13 and 14, thus causing it to project beyond said edge for the purpose of permitting the automatic conditioning of the operative edge of the belt to maintain it in substantially the same condition at all times, a process which might be termed "sharpening." This sharpening is required to avoid inequalities in the operative edge of the scraper belt 40 due to wear. The mechanism employed for this purpose consists of a metallic disk 41 mounted upon the arbor of the pulley 13, said disk being of a greater diameter than said pulley. Carried by the outer end of the arbor is an abutment 42 forming a seat for a spring 43 adapted to force said disk 41 toward the pulley 13. Said disk 41 is preferably loosely mounted upon the arbor of the pulley 13. This construction causes the disk 41 to bear upon the projecting edge of the scraper belt 40, the movement of the belt tangential to the pul-

ley 13, combined with the rotary movement of the disk 41, resulting in a continuous grinding or polishing of the edge of the said belt during the operation thereof.

The operation of the herein described mechanism is substantially as follows:— While the printing press is running, the chain A travels about a rectangular course and carries with it a plurality of type beds B, in order to have the four steps incidental to the taking of an imprint, carried on simultaneously but upon different plates. The operation of the attachment herein described, however, being similar with each plate, it will be described only with relation to a single plate it being understood that this mode of operation would be the same whether the attachment be applied to a press of this type or to any other type of under surface or engraving printing presses. As the plate C passes under the ink rolls D, ink is deposited upon the upper surface of said plate and within the intaglio cuts thereon in the usual and well known manner. While the various plate beds are being driven, the driving mechanism 15 and 16 is rotating the pulley 13 to continuously feed the scraper belt or band 6 transversely of the line of movement of the plate C, in substantially the plane of the upper surface of said plate. As the plate C passes under this scraper band or belt 6 the under side thereof will engage the top surface of said plate and press upon same sufficiently to bring the narrow edge of said scraper into intimate contact with the top surface of the plate. With the subsequent operation of the machine during the engagement of the scraper with the plate, the former will be in continuous engagement with the latter and these two will have simultaneous movement along lines substantially perpendicular to each other thus causing the scraper 6 to have access to every portion of said top surface and scrape up a substantial proportion of the ink deposited thereon. The ink thus collected upon the scraper 6, by reason of the nature of the material of said strip, rests upon the surface thereof and is fed thereby to a point beyond the plate C where it is removed by the supplemental scraper plate 32, through the engagement of said scraper plate with said scraper belt and the intimate contact of these two parts one with the other. As the ink is forced against the plate 32, the inclination of this plate causes ink to travel along same until it is discharged upon the block 34 over which it flows into the vessel or receptacle 30 supported beneath the discharge end of said supplemental scraper.

Wherever circumstances will permit, as in connection with a flat bed press higher efficiency may be secured by giving a horizontal inclination to the scraper belt 6, an

arrangement which affords a greater operative area to any portion of said belt.

The continuous traverse of the scraper 6 not only makes the scraping action thereof more effective but prevents the accumulation of ink above the operative edge thereof thus permitting an extended run of the press without the necessity of shutting down for a substitution of scrapers, or for the cleaning thereof. The continuous engagement of the scraper 6 with the plate C insures a continuous scraping action as to the plate itself, thus avoiding streaks upon the plate which would occur were this engagement of the scraper and plate intermittent, however slight the intervals of disengagement might be. The narrow operative edge of the scraper 6, as above stated, insures that intimate relation of the said edge with the plate necessary to prevent the piling of ink in advance of the scraper, a condition which would not only tend to permit the escape of ink under this scraper in spots, but would result in a loss of ink after the entire plate had left the scraper. The back 8 and the flanges upon the pulleys 13 and 14 absorb all of the longitudinal stresses upon the scraper 6. The downward pitch of the scraper 6 not only provides a raised surface for the accumulation of the ink removed from the surface of the plate, but permits the operative or narrow edge of the scraper to be brought into intimate relation with said top surface. The adjusting screws 17 extending as they do the entire length of the flange 10, exert sufficient pressure upon the scraper 6 through the contact 12, to maintain the upper edge of the scraper belt 6 perfectly flat throughout the operative range thereof relative to the engraved plate.

If it be found that certain portions of the plate, through irregularities in the plate or from any other reason take more ink from the rolls than is required, any of the adjusting screws 11 may be forced downwardly to depress the operative edge of said scraper at that point, to secure a more intimate engagement of the scraper with the plate or plates. The back 8 being fixed relative to the plane of movement of the plate C, such adjustment may be accomplished irrespective of the fact that the scraper 6 itself has movement independent of that of said plate.

In making ready for a run, the scraper 6 may be adjusted so as to bring its lower edge into the desired plane, by means of the adjusting screws 20 and 21 the proper adjustment being determined by the skill of the pressman.

If it be found that any slack occurs along the operative edge of the scraper 6, this slack may be taken up through the adjusting screws 27 and 28, by swiveling the

frame 19 carrying the pulley 13 slightly. This slight movement of the pulley will serve merely to tension the lower, or operative, edge of the scraper belt 6, which belt is held at all times sufficiently taut between the pulleys 13 and 14 to insure the proper drive of same and at the same time prevent the belt escaping from said pulleys. The slight outward movement of the pulley 13, will tend to so tighten the belt about the lower edge thereof as to further avoid the escape of this belt from said pulley.

The platen block 34 being in intimate contact with the plate 32 adjacent to the delivery end thereof, and being shaped to conform to the scraper belt 6, said scraper will be substantially entirely freed from ink prior to its passage to the pulley 13, thus avoiding the fouling of the pulleys 13 and 14. If a very small quantity of ink should remain upon said belt, it would serve merely to avoid slippage of the belt much in the same manner as the ordinary leather belt dressing.

It will be observed that the operation of the scraper mechanism is synchronized with that of the entire press, thus insuring a fixed driving speed of the belt relative to that plate at all times.

After the plate C has had the ink scraped from the top surface thereof it is passed under the wiping and polishing cloths of the usual and well known, or any approved, type, which cloths serve to remove any superficial ink remaining upon the plate and to polish the surface thereof preparatory to the feeding of the paper relative thereto, and the taking of the imprint therefrom. The quantity of ink removed from the plate C has the twofold result of effecting a saving of the ink removed from the plate, and at the same time, diminishing the quantity of ink necessarily removed by the wiping cloth to an extent where cloths will not become readily fouled. In printing from engraved plates heretofore, the conditioning of the wiper cloths has been a more or less important factor, it being generally recognized that for the first wiping, a clean cloth would not absorb the ink sufficiently rapidly to avoid streaking of the plate and would absorb ink from the intaglio cuts thus causing the polishing cloths to become more or less fouled and preventing the proper packing of the lines. As the wiping cloths become partially saturated with ink, they reach their highest efficiency as wipers, but soon thereafter the quantity of ink taken up by the cloths would exhaust their absorptive powers, and thus necessitate the substitution of new cloths. By the use of a non-absorbent scraper for removing the greater part of the ink deposited upon the upper surface of the plate prior to the application of the wiper cloths to the plate, I not only effect a saving

of the ink, as before stated (which is a primary object of the invention), but leave only sufficient ink to properly "pack" the line, thus minimizing the quantity of ink to be removed by the wiper. Furthermore, the quantity of ink which the wiper cloths will be required to absorb will be readily taken up by a fresh cloth and will foul this cloth so slowly as to permit a slow feed of said cloth permitting a previously used portion thereof to complete the "packing" of the line, thus practically placing no material limitation upon the length of the run by reason of the fouling of this cloth. Furthermore, the efficiency of the wiping and polishing mechanism will always be at the highest, and that streaking of the plate, which now requires the closest attention of the pressman, to avoid, will be avoided.

While I have shown the invention as applied to a flat bed press, and have shown a form thereof specially adapted for use in such a press, it is not my intention to limit the invention to a scraper for use in connection with such presses, or to those details of construction shown in the drawings to adapt it to such a press.

I believe it to be broadly new to provide in a printing press, a scraper of nonabsorbent material adapted to be continuously presented to the surface of the plate in a manner to cause the movement of the plate to force the superficial ink deposited thereon by the inking rollers upon said scraper, and I intend to claim such broadly. I also believe it to be broadly new to provide a non-absorbent scraper having a continuous contact with the plate which has a movement transversely of the plate concurrently with the movement of the plate itself for the twofold purpose of increasing the efficiency of the scraping action of the scraper and conveying the portions thereof upon which the ink is accumulated to the supplemental scraping mechanism for removing same from the main scraper.

This invention relates more particularly to a sub-combination in an under surface or engraving printing press for preparing the plate after the ink has been applied thereto for taking the imprint, and the showing of the drawings is directed solely to this sub-combination, the incorporation in the drawings of the inking mechanism being merely for the purpose of establishing more clearly the relation of the various parts.

Having described the invention, what I claim as new and desire to have protected by Letters Patent, is:—

1. In a printing press, a mechanism for removing the surface ink from an engraved or intaglio plate, embodying therein a scraper of non-absorbent material having a narrow edge bearing continuously upon a

plate, said scraper having a surface thereon adapted to receive and accumulate the ink removed from the plate, means varying the position of said scraper relative to said plate while in engagement therewith, means removing the accumulated ink from said scraper, and means moving said plate toward said scraper, whereby the movement of the plate forces the ink upon said surface of said scraper.

2. In a printing press, a mechanism for removing the surface ink from an engraved or intaglio plate, embodying therein a scraper of flexible material having a narrow edge, bearing continuously upon a plate, said scraper having a surface thereon adapted to receive and accumulate the ink removed from the plate, means varying the position of said scraper relative to said plate while in engagement therewith, means removing the accumulated ink from said scraper, and means moving said plate toward said scraper, whereby the movement of the plate forces the ink upon said surface of said scraper.

3. In a printing press, a mechanism for removing the surface ink from an engraved or intaglio plate, embodying therein a scraper consisting of a strip of non-absorbent material extending at an angle with a narrow edge thereof bearing continuously upon said plate, said scraper having a surface thereon above the edge engaging the plate, adapted to receive and accumulate the ink removed from the plate, means varying the position of said scraper relative to said plate during its engagement therewith, means removing the ink accumulated upon the surface of said scraper, and means moving said plate toward said scraper.

4. In a printing press, a mechanism for removing the surface ink from an engraved or intaglio plate, embodying therein a scraper consisting of a strip of flexible material extending at an angle with a narrow edge thereof bearing continuously upon said plate, said scraper having a surface thereon above the edge engaging the plate, adapted to receive and accumulate the ink removed from the plate, means varying the position of said scraper relative to said plate during its engagement therewith, means removing the ink accumulated upon the surface of said scraper, and means moving said plate toward said scraper.

5. In a printing press, a mechanism for removing surface ink from an engraved, or intaglio plate, consisting of a strip of flexible, non-absorbent material extending at an angle toward and with a narrow edge thereof bearing continuously upon, said plate, said scraper above said edge having a surface adapted to receive and accumulate the ink removed from the plate, means whereby said scraper may be adjusted to

ward or from the plate to vary the pressure exerted thereby, means varying the position of said scraper relative to said plate while in engagement therewith, means removing
5 the ink accumulated upon said surface of said scraper, and means moving said plate toward said scraper.

6. In a printing press, a mechanism for removing surface ink from an engraved or
10 intaglio plate embodying therein a scraper consisting of a strip of flexible non-absorbent material extending at an angle with its edge bearing continuously upon a movable plate, means depressing a portion of the operative edge of said scraper toward said
15 plate, a supplemental scraper for removing the accumulated ink from said first named scraper, means automatically imparting movement to one of said scrapers relative to the other, and means moving said plate toward said first named scraper.

7. In a printing press, a mechanism for removing surface ink from an engraved or
25 intaglio plate embodying therein a scraper consisting of a strip of flexible non-absorbent material extending at an angle toward, and with its edge bearing continuously upon, said plate, means adjusting said scraper toward said plate, a supplemental
30 scraper for removing the accumulated ink from said first named scraper, means automatically imparting movement to one of said scrapers relative to the other means moving said plate toward said scraper, and
35 means depressing a portion of the operative edge of said first named scraper toward said plate.

8. In a printing press, a mechanism for removing surface ink from an engraved or
40 intaglio plate embodying therein a scraper of non-absorbent material having a narrow edge bearing continuously upon said plate, and a surface above said edge adapted to accumulate ink, a supplemental scraper bearing
45 continuously upon said first named scraper, out of the line of movement of said plate, means moving said plate toward said first named scraper, and means simultaneously moving said scraper transversely of
50 said plate.

9. In a printing press, a mechanism for removing surface ink from an engraved or
intaglio plate embodying therein a scraper of non-absorbent material having a narrow
55 edge bearing continuously upon said plate, and a surface above said edge adapted to accumulate ink, a supplemental scraper bearing continuously upon said first named scraper, out of the line of movement of said
60 plate, means moving said plate toward said first named scraper, and means simultaneously moving said scraper transversely of said plate.

10. In a printing press, a mechanism for
65 removing surface ink from an engraved or

intaglio plate embodying therein a scraper consisting of a strip of non-absorbent material extending at an angle toward said plate and having a narrow edge bearing continuously upon said plate, and a surface above
70 said edge adapted to accumulate ink, a supplemental scraper bearing continuously upon said first named scraper, out of the line of movement of said plate, means moving said plate toward said first named scraper, and
75 means simultaneously moving said first named scraper transversely of said plate.

11. In a printing press, a mechanism for removing surface ink from an engraved or
intaglio plate embodying therein a scraper consisting of a strip of flexible non-absorbent material extending at an angle toward said
80 plate and having a narrow edge bearing continuously upon said plate, and a surface above said edge adapted to accumulate ink,
85 a supplemental scraper bearing continuously upon said first named scraper, out of the line of movement of said plate, means moving said plate toward said first named scraper, and means simultaneously moving said first
90 named scraper transversely of said plate.

12. In a printing press, a mechanism for removing surface ink from an engraved or
intaglio plate embodying therein a scraper consisting of a strip of flexible non-absorbent material extending at an angle toward
95 said plate and having a narrow edge bearing continuously upon said plate, and a surface above said edge adapted to accumulate ink, means adjusting said scraper toward said
100 plate, a supplemental scraper bearing continuously upon said first named scraper, out of the line of movement of said plate, means moving said plate toward said first named scraper, and means simultaneously moving
105 said first named scraper transversely of said plate.

13. In a printing press, a mechanism for removing surface ink from an engraved or
intaglio plate embodying therein a scraper consisting of a strip of flexible non-absorbent material extending at an angle toward
110 said plate and having a narrow edge bearing continuously upon a movable plate, and a surface above said edge adapted to accumulate ink, means depressing a portion of the operative edge of said scraper toward said
115 plate, a supplemental scraper bearing continuously upon said first named scraper, out of the line of movement of said plate, means
120 moving said plate toward said first named scraper, and means simultaneously moving said first named scraper transversely of said plate.

14. In a printing press, a mechanism for
125 removing surface ink from an engraved or intaglio plate embodying therein a scraper consisting of a strip of flexible non-absorbent material extending at an angle toward, with its edge bearing continuously upon said
130

plate, means adjusting said scraper toward said plate, means moving said plate toward said scraper, means depressing a portion of the operative edge of said scraper toward
 5 said plate, and means simultaneously moving said scraper transversely of said plate.

15 In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a scraper consisting of an endless band of non-absorbent material having a narrow edge bearing continuously upon said plate, and a surface
 10 above said plate adapted to accumulate ink, oppositely disposed pulleys about which said band is passed and between which it is stretched, a supplemental scraper bearing continuously upon said first named scraper
 15 adjacent to one of said pulleys, means moving said plate toward said first named scraper and means rotating said band about
 20 said pulleys.

16. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a scraper
 25 consisting of an endless band of non-absorbent flexible material having a narrow edge bearing continuously upon said plate, and a surface above said plate adapted to accumulate ink, oppositely disposed pulleys about
 30 which said band is passed and between which it is stretched, a supplemental scraper bearing continuously upon said first named scraper adjacent to one of said pulleys, means moving said plate toward said first
 35 named scraper and means rotating said band about said pulleys.

17. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a scraper
 40 consisting of an endless band of non-absorbent material extending at an angle toward said plate and having a narrow edge, bearing continuously upon said plate, and a surface above said plate adapted to accumulate
 45 ink, oppositely disposed pulleys about which said band is passed and between which it is stretched, a supplemental scraper bearing continuously upon said first named scraper adjacent to one of said pulleys, means moving
 50 said plate toward said first-named scraper and means rotating said band about said pulleys.

18. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a scraper
 55 consisting of an endless band of non-absorbent flexible material extending at an angle toward said plate and having a narrow edge, bearing continuously upon said plate, and a surface above said plate adapted to
 60 accumulate ink, oppositely disposed pulleys about which said band is passed and between which it is stretched, a supplemental scraper bearing continuously upon said first named
 65 scraper adjacent to one of said pulleys,

means moving said plate toward said first-named scraper and means rotating said band about said pulleys.

19. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a scraper
 70 consisting of an endless band of non-absorbent flexible material extending at an angle with its edge, bearing continuously upon said plate, oppositely disposed pulleys about which said band is passed and between
 75 which it is stretched, means moving said plate toward said scraper, means adjusting said pulleys toward said plate, and means rotating said band about said pulleys. 80

20. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a scraper
 85 consisting of an endless band of non-absorbent flexible material extending at an angle with its edge, bearing continuously upon said plate, oppositely disposed pulleys about which said band is passed and between which it is stretched, means moving said plate toward
 90 said scraper, adjusting means acting on the lower reach of said scraper whereby any portion of the operative edge thereof may be depressed toward said plate, and means rotating said band about said pulleys. 95

21. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a scraper
 100 consisting of an endless band of non-absorbent flexible material extending at an angle with its edge, bearing continuously upon said plate, oppositely disposed pulleys about which said band is passed and between
 105 which it is stretched, means moving said plate toward said scraper, means adjusting said pulleys toward said plate, adjusting means acting on the lower reach of said scraper whereby any portion of the
 110 operative edge thereof may be depressed toward said plate, and means rotating said band about said pulleys. 115

22. In a printing press, a mechanism for removing surface ink from an engraved or intaglio plate embodying therein a scraper
 115 consisting of a strip of flexible material, bearing continuously upon said plate, means moving said plate toward said scraper, means simultaneously moving said scraper transversely of said plate, and a rigid back
 120 fixed relative to the plane of movement of the plate, having a channel therein engaging both sides of said scraper throughout the operative range thereof relative to said plate. 125

23. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates embodying therein a scraper
 125 consisting of an endless band of flexible material, one reach of which bears continuously on said plate, oppositely disposed pulleys about which said band is passed and between 130

which it is stretched, means moving said plate toward said scraper, means rotating said band about said pulleys and a rigid back fixed relative to the plane of movement of said plate and between said pulleys, said back having a channel therein adapted to engage both sides of one reach of said band throughout the operative range thereof.

24. In a printing press, a mechanism for removing surface ink from an engraved or intaglio plate embodying therein a scraper consisting of a strip of flexible material, bearing continuously upon said plate, means moving said plate toward said scraper, means simultaneously moving said scraper transversely of said plate, a rigid back fixed relative to the plane of movement of the plate, having a channel therein engaging both sides of said scraper throughout the operative range thereof relative to said plate, the upper side of said channel being deeper than the lower, a thick flexible member interposed between said upper side and said scraper and adjustment screws arranged at diverging points of the overhanging portion of said upper side, whereby any portion of the operative area of said scraper may be adjusted toward or from the plane of movement of the plate.

25. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a scraper consisting of an endless band of non-absorbent material bearing continuously upon said plate, oppositely disposed pulleys about which said band is passed and between which it is stretched, means adjusting said pulleys toward and from the plane of movement of said bed, means moving said plate toward said scraper and means rotating said band about said pulleys.

26. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates embodying therein a scraper consisting of an endless band of non-absorbent material bearing continuously upon said plate, oppositely disposed pulleys about which said band is passed and between which it is stretched, means whereby the relative position of the axes of said pulleys may be varied to vary the tension of said band, means moving said plate toward said scraper, and means rotating said band about said pulleys.

27. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates embodying therein a scraper consisting of an endless band of non-absorbent material bearing continuously upon said plate, oppositely disposed pulleys about which said band is passed and between which it is stretched, the arbor of one of said pulleys being fixed and the arbor of the other pulley being mounted upon a frame capable of rotation about a vertical

axis, means whereby said frame may be rotated to vary the distance between the axes of said pulleys to vary the tension on said belt, means moving said plate toward said scraper, and means rotating said band about said pulleys.

28. In a printing press, a mechanism for removing surface ink from an engraved or intaglio plate, embodying therein a scraper of non-absorbent material having a narrow edge bearing continuously upon said plate, a surface above said edge adapted to accumulate ink, means moving said plate toward said scraper whereby the surface ink of said plate will be deposited by the movement thereof upon said scraper, a supplemental scraper bearing continuously upon, at a point beyond the line of traverse of, said plate, and adapted to remove the ink from said first-mentioned scraper, and means imparting movement to one of said scrapers relative to the other.

29. In a printing press, a mechanism for removing surface ink from an engraved or intaglio plate embodying therein a scraper of non-absorbent material having a narrow edge bearing continuously upon said plate, a surface above said edge adapted to accumulate ink, means moving said plate toward said scraper, means simultaneously moving said scraper transversely of said plate, and a relatively fixed supplemental scraper bearing continuously upon said main scraper beyond the line of traverse of said plate whereby the movement of said main scraper relative to said supplemental scraper will remove the ink deposited thereon.

30. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a main scraper consisting of an endless band of non-absorbent material, one reach of which bears continuously upon said plate, oppositely disposed pulleys about which said band is passed and between which it is stretched, means moving said plate toward said scraper, means rotating said band about said pulleys, and a supplemental scraper bearing upon the operative reach of said band and between the point of operative engagement of said band with the plate and the pulley over which said band passes, whereby the ink accumulated upon said band will be removed before said band passes to said pulley.

31. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a main scraper consisting of an endless band of non-absorbent material, one reach of which bears continuously upon said plate, oppositely disposed pulleys about which said band is passed and between which it is stretched, means moving said plate toward said scraper, means rotating said band about

said pulleys, and a supplemental scraper bearing upon the operative reach of said band and between the point of operative engagement of said band with the plate and the pulley over which said band passes, whereby the ink accumulated upon said band will be removed before said band passes to said pulley, said supplemental scraper consisting of a backing block adapted to engage the bottom of the operative reach of said band, and conform in shape therewith, a block, and a scraper plate carried thereby and projecting diagonally across the said band and bearing upon said band and said backing block, whereby the ink collected upon said band will be accumulated by said supplemental scraper plate and discharged upon said backing block and into a suitable receptacle.

32. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a main scraper consisting of an endless band of non-absorbent material, one reach of which bears continuously upon said plate, oppositely disposed pulleys about which said band is passed and between which it is stretched, means moving said plate toward said scraper, means rotating said band about said pulleys, and a supplemental scraper bearing upon the operative reach of said band and between the point of operative engagement of said band with the plate and the pulley over which said band passes, whereby the ink accumulated upon said band will be removed before said band passes to said pulley, said supplemental scraper consisting of a backing block adapted to engage the bottom of the operative reach of said band, and conform in shape therewith, a block, a scraper plate carried thereby and projecting diagonally across the said band and bearing upon said band and said backing block, whereby the ink collected upon said band will be accumulated by said supplemental scraper plate and discharged upon said backing block and into a suitable receptacle, and means adjusting said blocks toward and from said pulley.

33. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a main scraper consisting of an endless band of non-absorbent material extending diagonally across the plane of movement of said plate and bearing continuously thereon, a supplemental scraper bearing continuously upon the said first named scraper, means imparting a relative movement of one of said scrapers to the other and means moving said plate toward said scraper.

34. In a printing press, a mechanism for removing surface ink from an engraved or intaglio plate embodying therein a scraper of non-absorbent material extending diagonally across the plane of movement of said plate and bearing continuously thereon, a supplemental scraper bearing continuously upon said first named scraper, means moving said plate toward said scraper, and means simultaneously moving said first named scraper transversely of said plate, in combination with supple-

nally across the plane of movement of said plate and bearing continuously thereon, a supplemental scraper bearing continuously upon said first named scraper, means moving said plate toward said scraper and means simultaneously moving said scraper transversely of said plate.

35. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates, embodying therein a scraper consisting of an endless band of non-absorbent material bearing continuously upon said plate, oppositely disposed pulleys about which said band is passed and between which it is stretched, said pulleys being set to cause said band to extend diagonally across the plane of movement of said plate, means moving said plate toward said scraper and means rotating said band about said pulleys.

36. In a printing press, a mechanism for removing surface ink from engraved or intaglio plates embodying therein a scraper consisting of a straight endless band of non-absorbent material, pitched downwardly toward the plane of movement of, and adapted to bear continuously upon, said plate, oppositely disposed pulleys about which said band is passed and between which it is stretched, means moving said plate toward said scraper, means rotating said band about said pulleys, said band being wider than said pulleys, and sharpening means consisting of a metallic disk loosely mounted upon the arbor of one of said pulleys, said disk being of greater diameter than said pulley, and a spring forcing said disk into engagement with the operative edge of said band.

37. In a printing press, a mechanism for removing surface ink from an engraved or intaglio plate embodying therein a scraper of non-absorbent material having a narrow edge bearing continuously upon said plate and a surface above said edge adapted to accumulate ink, a supplemental scraper bearing continuously upon said first named scraper, means imparting relative movement of one of said scrapers to the other, and means moving said plate toward said first named scraper, in combination with supplemental absorbent wiping and polishing means.

38. In a printing press, a mechanism for removing surface ink from an engraved or intaglio plate embodying therein a scraper of non-absorbent material having a narrow edge bearing continuously upon said plate, and a surface above said edge adapted to accumulate ink, a supplemental scraper bearing continuously upon said first named scraper, means moving said plate toward said scraper, and means simultaneously moving said first named scraper transversely of said plate, in combination with supple-

mental absorbent wiping and polishing means.

39. In a printing press, a mechanism for removing surface ink from engraved or in-
5 taglio plates, embodying therein a scraper consisting of an endless band of non-absorbent material having a narrow edge bearing continuously upon said plate, and a surface above said edge adapted to accumulate ink,
10 a supplemental scraper bearing continuously upon said first named scraper, oppositely disposed pulleys about which said band is passed and between which it is

stretched, means moving said plate toward said scraper and means rotating said band 15 about said pulleys, in combination with supplemental absorbent wiping and polishing means.

In witness whereof I have hereunto affixed my signature, this 13th day of October, 20 1909, in the presence of two witnesses.

CHARLES A. STURTEVANT.

Witnesses:

P. V. WENING,
P. FRANK SONNEK.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
