July 18, 1939. H. A. W. WOOD 2,166,737

WEB SPLICING APPARATUS

Original Filed Jan. 4, 1933 5 Sheets-Sheet 1

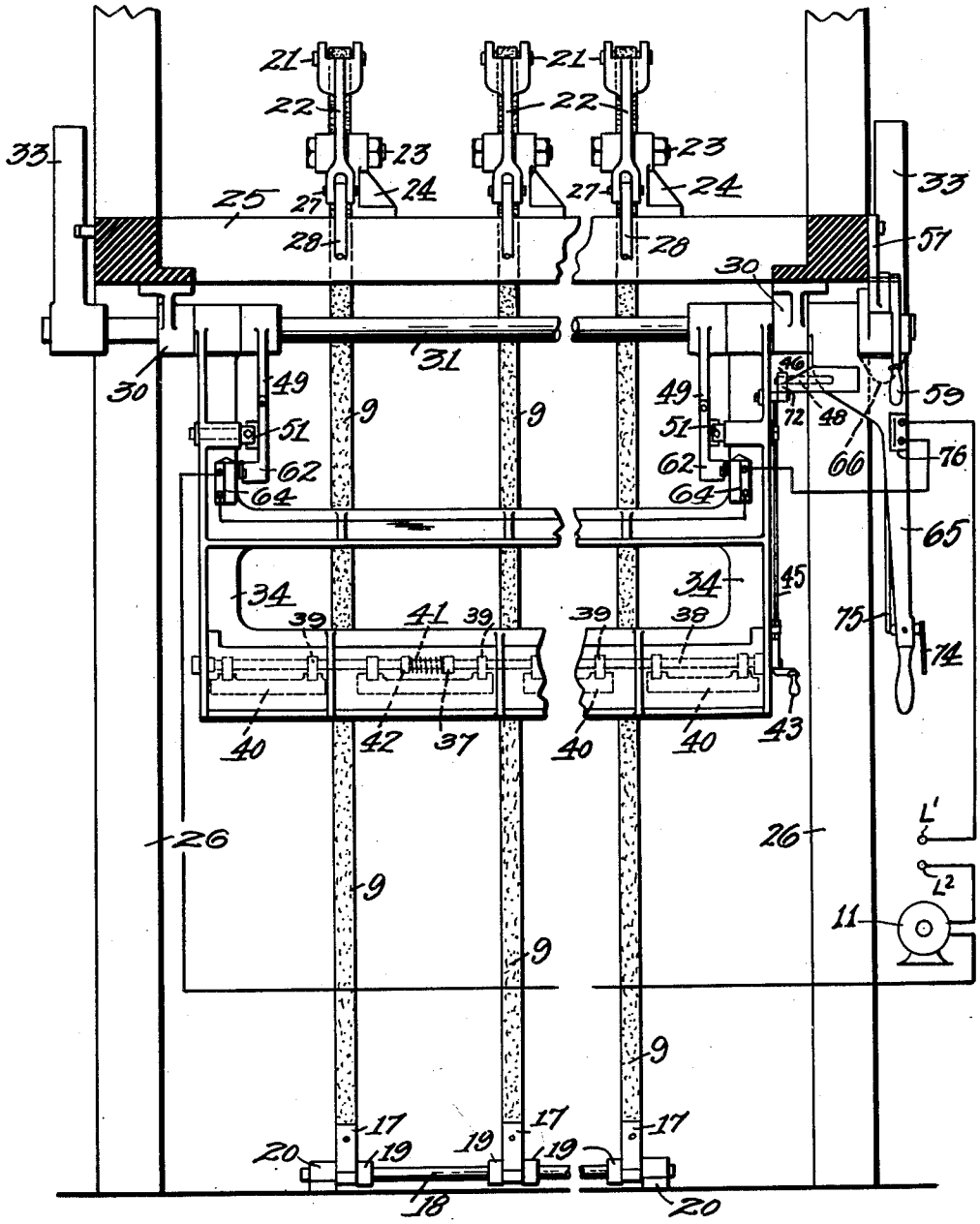


Fig. 1

Inventor
Henry A. Wise Wood
By attorneys
Scull Gatchell Fay & Hartley

July 18, 1939. H. A. W. WOOD 2,166,737

WEB SPLICING APPARATUS

Original Filed Jan. 4, 1933 5 Sheets-Sheet 2

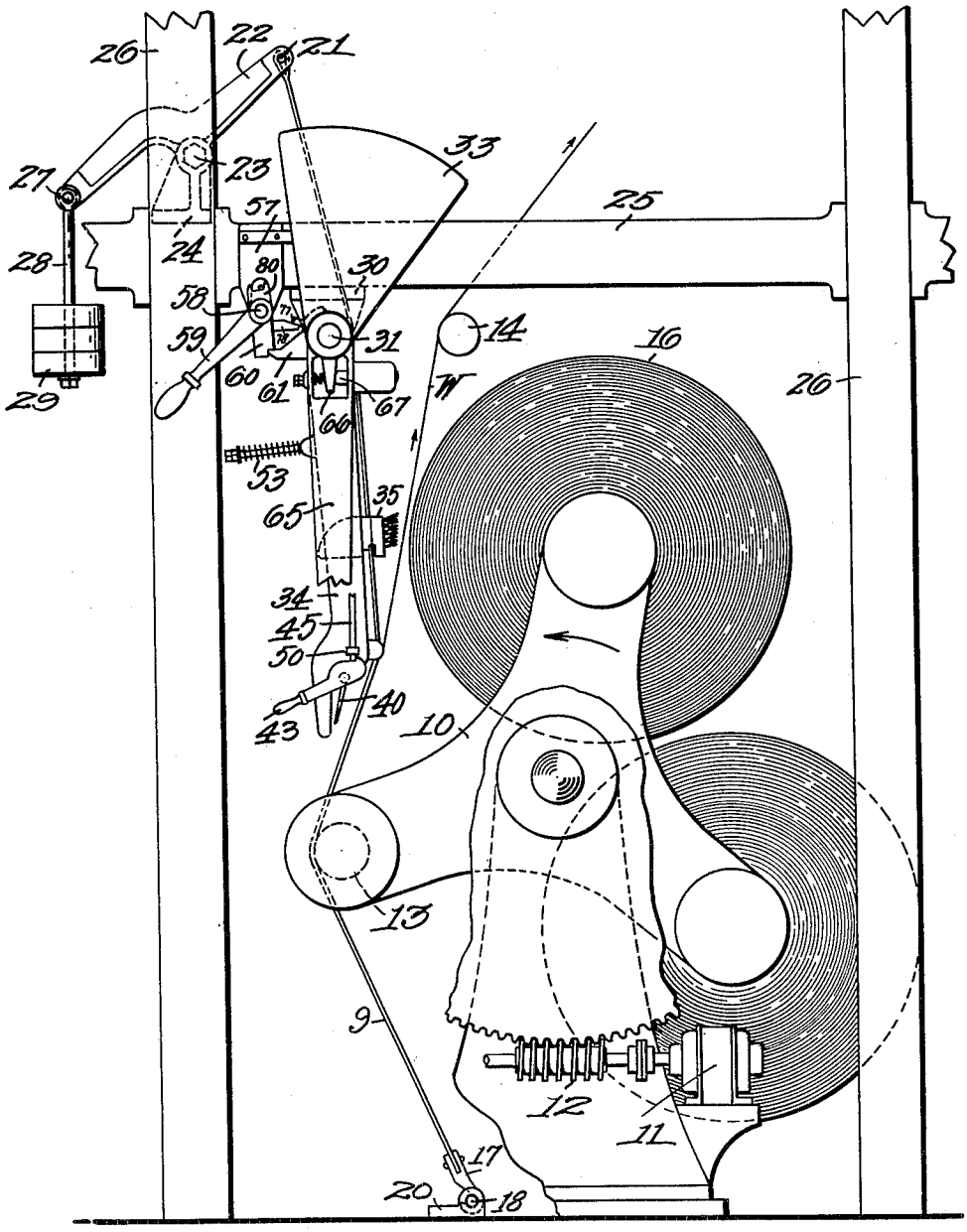


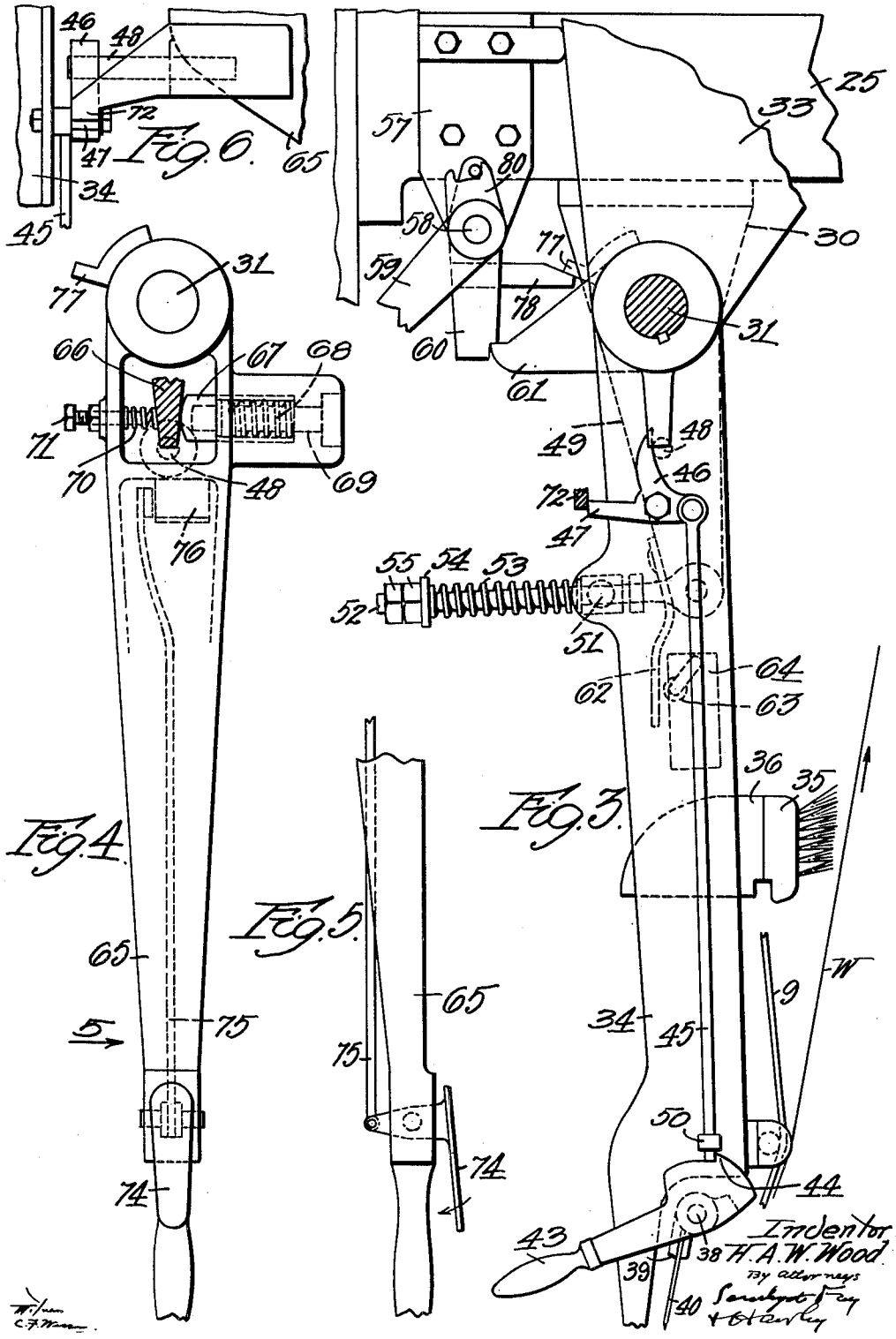
Fig. 2.

Inventor
Henry A. Wise Wood
By attorneys
Sawtelle Fay & Hartley

July 18, 1939. H. A. W. WOOD 2,166,737

WEB SPLICING APPARATUS

Original Filed Jan. 4, 1933 5 Sheets-Sheet 3



July 18, 1939. H. A. W. WOOD 2,166,737

WEB SPLICING APPARATUS

Original Filed Jan. 4, 1933 5 Sheets-Sheet 4

Fig. 7.

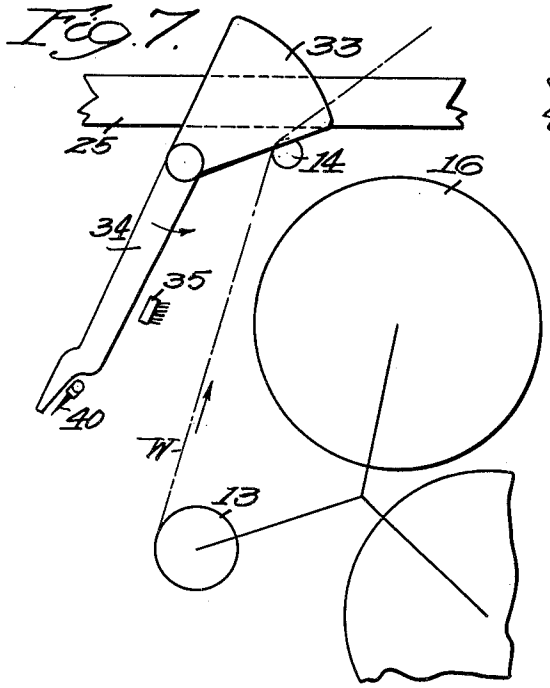


Fig. 8.

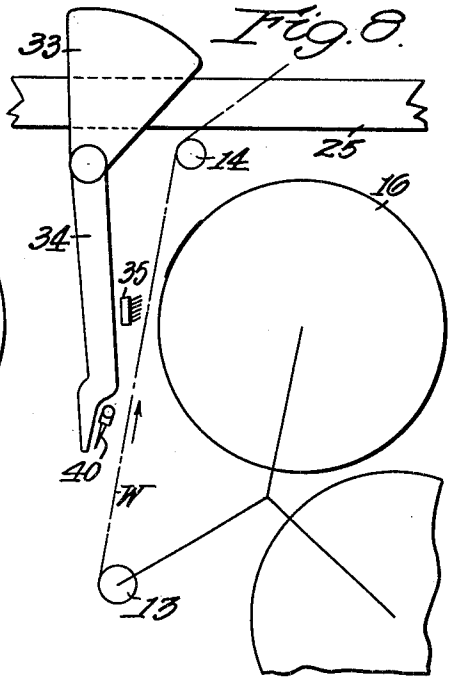
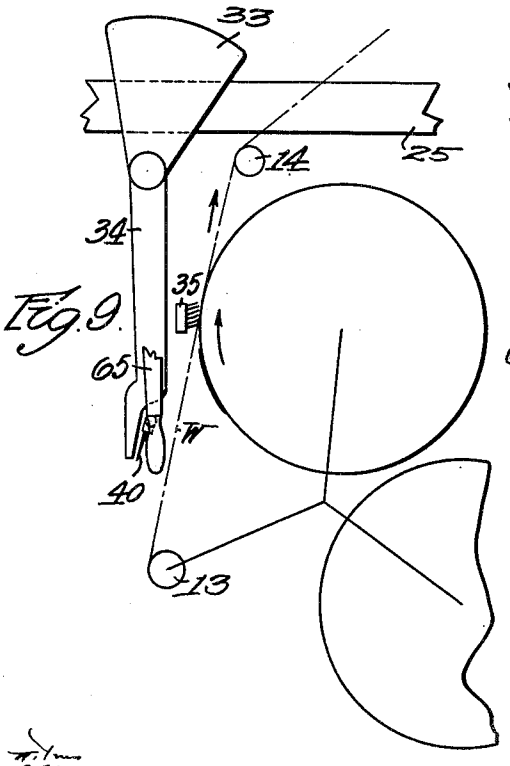


Fig. 9.



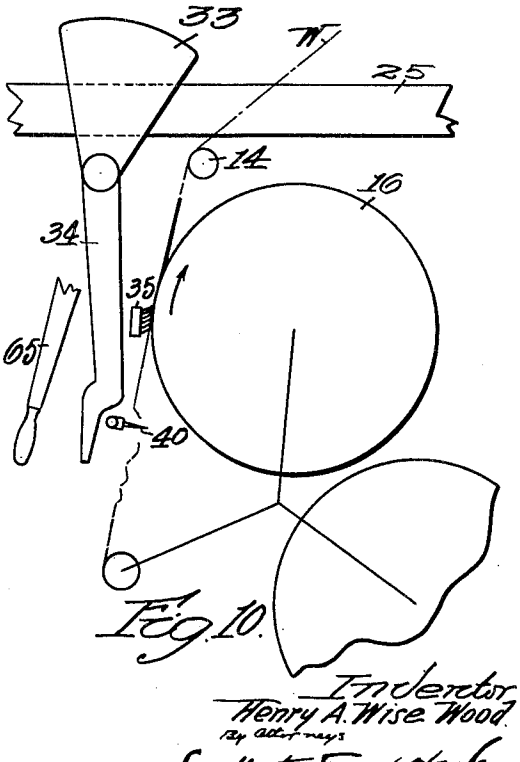


Fig. 10.

Inventor
Henry A. Wise Wood
By Attorneys
Sam Hayden Fay & Hayden

July 18, 1939. H. A. W. WOOD 2,166,737

WEB SPLICING APPARATUS

Original Filed Jan. 4, 1933 5 Sheets-Sheet 5

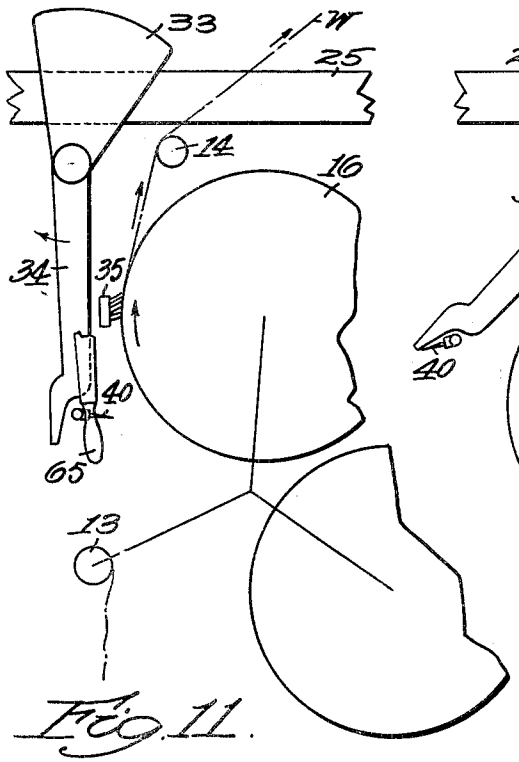


Fig. 11.

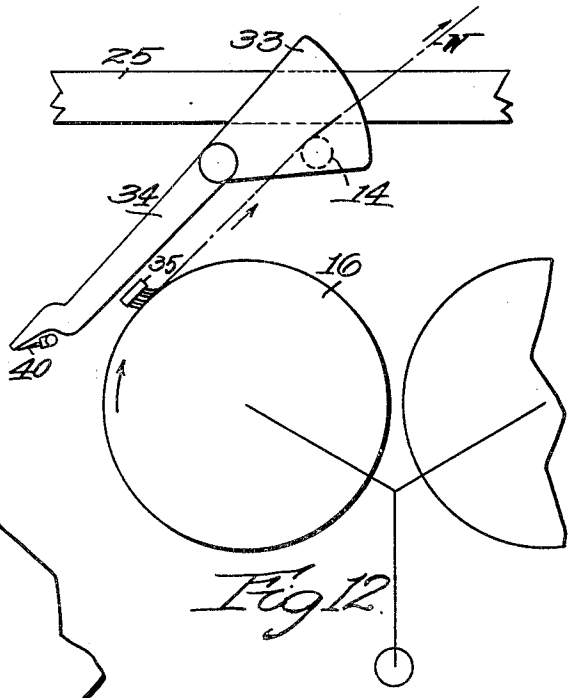


Fig. 12.

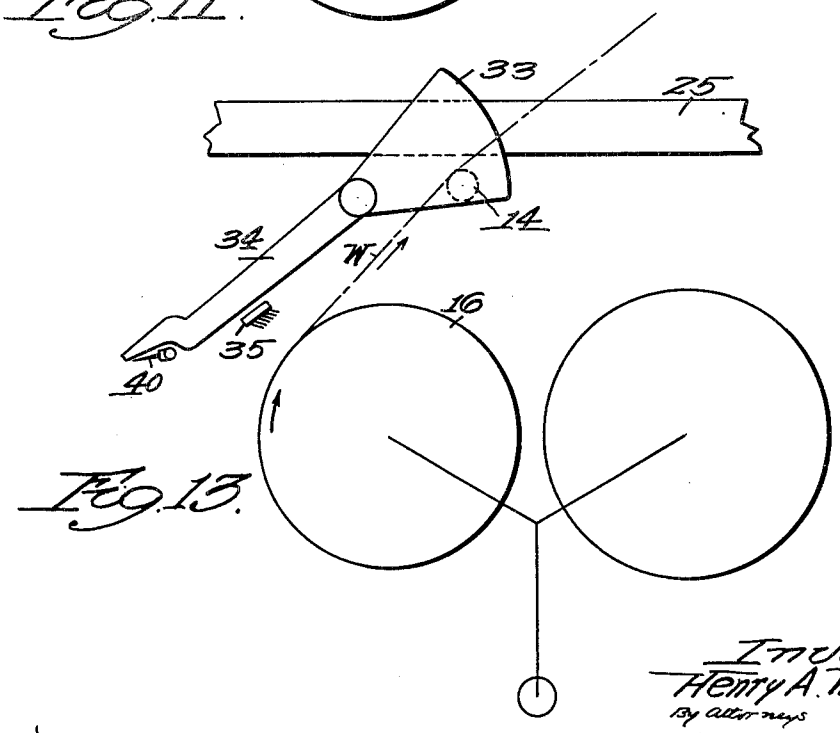


Fig. 13.

Inventor
Henry A. Wise Wood
By attorneys
Southgate Fay & Hawley

W. Inc
C. F. Wesson.

Patented July 18, 1939 2,166,737

UNITED STATES PATENT OFFICE

2,166,737

WEB SPLICING APPARATUS

Henry A. Wise Wood, New York, N. Y., assignor to Wood Newspaper Machinery Corporation, New York, N. Y., a corporation of Virginia

Application January 4, 1933, Serial No. 650,121
Renewed July 13, 1937

17 Claims. (Cl. 242—58)

This invention relates to that type of web splicing device for printing presses and the like, in which yielding means beyond the web moves into and out of position and the fresh web roll is moved into contact with the web from the other side to force the web against the yielding means to make the paster.

The principal objects of the invention are to construct the yielding means in such a way as to produce a predetermined pressure against the web and the roll of such a degree that this pressure may be used to speed up the incoming roll to web speed in the fraction of a revolution without seriously endangering the web; to provide a latch for holding the yielding means in its operative position and means for releasing the latch when the web is severed so that the yielding means may move to its inoperative position and the yielding web pressing means may be used to control the fresh roll and later the running roll as it moves into contact wtih the tension members; to provide a handle for releasing the knife for enabling it to sever the web and release the latch which holds the brush arm in its operative position, the same handle operating to bring the brush arm down to operative position and being so constructed and arranged as to insure the passage of a certain interval of time between the tripping of the severing knife and the release of the latch, thereby avoiding the possibility of the latch being released on the brush arm before the knife has penetrated the running web; to provide a limit switch in the circuit of the reel motor and means for operating it to stop the reel motor when the pressure against the web and fresh roll has increased up to a certain predetermined amount, and in general to improve the type of web splicing apparatus referred to in the first paragraph above.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is an elevation of a web splicing device constituting a preferred embodiment of this invention, partly in section;

Fig. 2 is an end view of the same;

Fig. 3 is a similar view on a larger scale of the brush supporting arm and connected parts showing the handle in latched position just prior to splicing;

Fig. 4 is a similar view of the operating handle;

Fig. 5 is an elevation taken in the direction of the arrow 5 in Fig. 4;

Fig. 6 is an elevation of the upper part of the same;

Fig. 7 is a partially diagrammatic end view showing the parts in the normal inoperative position;

Fig. 8 is a similar view in the position with the brush arm latched;

Fig. 9 shows the position of the parts with the roll rotated into splicing position and the splice just about to be made;

Fig. 10 shows the next position in which the splice has been made and the operating handle has been pulled back to release the knife;

Fig. 11 shows the next position in which the handle has been moved forward and the brush latch released;

Fig. 12 shows the position in which the reel has has been rotated to bring the fresh roll into running position, and

Fig. 13 is the normally running position, showing the cycle completed and the splicing mechanism inoperative.

This invention is shown applied to a pasting device in which the necessary rotation of the roll supporting reel, through a small arc, is utilized to bring the fresh roll into contact with the running web and to force the web back against a member having a yielding surface.

Referring now to the drawings, it will be seen that the reel 10 is operated by a motor 11, with a worm 12 in a well known way. This reel has three pairs of arms as shown in the drawings, each pair adapted to carry a web roll. The expiring roll 13 is shown delivering the web W to the press over a guide roller 14. The fresh web roll 16 has paste spots applied to it.

For holding tension on the running roll straps 9 are employed. The lower end of each strap is provided with a hook 17 which partially encircles a shaft or rod 18 at the floor. The rod carries collars 19 for holding these hooks in their respective lateral positions and is secured to the floor or foundation by brackets 20. The upper end of each strap is secured to a stud 21 mounted on a lever 22, which is pivotally mounted by a stud 23 on a bracket 24 secured to a channel iron 25, which constitutes a part of the framework with the columns 26. The end of the lever carries a pin 27 to which is attached a rod 28 for the purpose of supporting freely weights 29, one or more of which may be placed in position to produce the desired tension on the straps.

Brackets 30 are secured to the framework of the press and provide bearings for an oscillatable shaft 31. To this shaft on the ends are

keyed weights 33. These weights serve for counterbalancing purposes. On the shaft 31 are pivoted a pair of arms 34 which constitute the supports for a frame for carrying the yielding surfaced member mentioned above. As this member is shown in this case as a series of brushes 35 the arms 34 are called brush arms. Supporting plates 36 are bolted on the frame and they and the brushes are provided with finished surfaces underneath by which they are bolted on the frame.

On this frame also are mountings for brackets 37 in which is mounted rotatably a knife shaft 38 carrying brackets 39 to which are secured severing knives 40. Springs 41 each have one end attached to one of the brackets 37 and the other to a collar 42 secured to the shaft. Thus a yielding pressure is exerted tending to rotate the knife shaft in a counterclockwise direction as viewed in Fig. 2. This throws the knife into the web to sever it when the shaft is released. Normally it is held by a cam handle 43 fixed to the shaft 38 and having a shoulder 44 bearing against a knife operating rod 45. When the rod is raised the springs are free to operate the knives. The operating rod 45 thus holds the severing knife until such time as the rod 45 is raised to allow the knife to operate. This knife operating rod 45 is pivotally connected with a lever 46, which is pivoted on the brush arm 34 and is provided with an upper curved cam projection and a toe 47. The upwardly projecting part of the lever 46 is, as will be explained, operated by a stop 48 on an operating arm 65, which is pivoted on the shaft 31. The knife operating rod 45 is mounted in a poppet 50 at its lower end.

On each brush arm 34 is mounted a poppet 51 penetrated by a spring rod 52 carrying a spring 53. This spring is held between the poppet 51 in each case and a collar 54 which is backed up by check nuts 55. The spring rod 52 is pivotally connected with the lower end of an arm 49 keyed to the shaft 31. This construction provides a yielding connection between the arms 49 and 34 on one side of the brush frame.

A bracket 57 is secured to the frame work of the press and provides a mounting for a short shaft 58 to which is fixed a handle 59, a latch 60, and a double stop projection 80. The weight of this combination is so placed that when the shaft 31 is swung to the position shown in Fig. 2 an extension 61 on the weight 33 on that side latches with the latch 60. This holds the shaft 31 in fixed position. Since there is a yielding connection bewteen the brush arms 34 and the arm 49 the brush arms are held substantially in this position also. The handle 59 is not used in the normal operation of the machine. It is useful only when the brush arm has been lowered and it is desired to move it to inoperative position, without making a splice.

The fresh web roll has moved through the positions shown in Figs. 7 and 8 successively. Now a motion of the fresh web roll toward the brush first causes contact of the running web and the fresh web roll. Further motion of the fresh roll in the same direction, as shown in Fig. 9 moves the brush frame 34 back and causes the switch rolls 63 to come into contact with the toes 62 on the ends of the arms 49. This moves the frame 34 to compress the springs 53 causing a relative motion between the arms 49 and 34. One of the limit switches 64 is mounted on each end of the brush arm construction and they are connected in the circuit of the reel motor so that the opening of these switches, as just described, will stop the reel motor and the bodily motion of the fresh web roll. It will be seen therefore that in this manner a predetermined amount of pressure can be provided for by the adjustment of the springs 53 between the brushes 35, the web W and the incoming roll. This predetermined pressure of the web against the fresh roll brings the fresh roll up to web speed efficiently and without undue strain on the web.

The operating arm 65 is freely and rotatably mounted on the shaft 31 and is provided with an opening or compartment in which a projection 66 from one of the weights 33 extends. This projection therefore is fixed with respect to the shaft 31 and to the arm 49 and is connected with the brush frame in such a way as to allow a slight freedom of movement which is taken up through the spring 53. On one side of the weight a thimble 67 operates, pressed against the projection 66 by a spring 68 and a plug 69 behind the spring. These parts are mounted on this handle 65. On the other side of this projection 66 presses a spring 70 held in position by an adjustable rod 71 which is in the form of a screw and constitutes a stop for the projection 66. This spring mechanism tends to keep the handle 65 yieldingly pressed in a counterclockwise direction with reference to the shaft 31. Attached to the handle 65 is a projection 72 which normally bears against the end of a projection 47 on the lever 46. Thus the projection 72 serves as a stop. It will be noticed that the counterweights are so placed that the brush arm is held normally in inoperative position as indicated in Figs. 7 and 13.

The operator grasps the lower end of the handle 65, and swings it in a counterclockwise direction, to the position shown in Fig. 2. The projection 72 bears against the projection 47 of the lever 46 and thereby forces the brush arm down to the operative position until such time as the toe 81 on the weight 33 cooperates with the latch 60. This holds the brush arm in the position shown in Fig. 2. Now everything is all set for the making of a splice. First a thumb latch 74 on the arm 65 is pressed. This thumb latch is connected by a link 75 to a switch 76 on the arm 65. This switch is so connected with the motor for rotating the reel that the depression of the thumb latch causes the motor to start and to rotate the reel in a counterclockwise direction as viewed in Fig. 2. The first action resulting is to bring the fresh roll from the position shown in Fig. 8 to that shown in Fig. 9 against the web. This presses the web against the brushes until the switches 64 are opened as described above. In the position shown in Fig. 9 the motion of the web starts the fresh roll rotating and in fact brings the roll to web speed in less than a complete rotation. It picks up the pre-pasted points as shown in Fig. 10 to complete the splice. After this, motion of the arm 65 in a clockwise direction causes the stud 48 carried thereby to contact with the curved upstanding portion of the lever 46 rotating it in a counterclockwise direction and thus lifting the knife operating rod 45 and releasing the lever 43. This permits the knives to rotate forward to sever the web as shown in Fig. 10. The shape of the cam 44 is such that the lever 46 will be held in the position to which it has been rotated so that the projection 47 thereon will clear the projecting piece 72. On account of this, rotation of the operating handle 65 in a counterclockwise direction will permit a further motion of this handle than formerly so that the toe 77

on the handle will bear against a latch release projection 78 on the latch 60. This releases this latch and permits the brush arm to move up to inoperative position, as shown in Fig. 12. By holding down the thumb latch 74 during this operation the release of the latch 60 will automatically start the reel rotating toward the tension members, the contact being re-established in the switches 64. The handle 65 may be used to hold the brushes against the fresh roll, which has now become the running roll, until such time as this roll is sufficiently under the control of the tension members to operate under normal running tension. Thereafter the parts are moved back to the position shown in Fig. 13, which is the normal running position.

From this it will be seen that the brush arm is held yieldingly with respect to the arm 49 and this yielding means can be so adjusted as to provide for a predetermined pressure against the web and roll for speeding up the incoming roll. This speeding up can be accomplished in a fraction of a revolution without seriously endangering the web.

It will be seen that thereafter the web is severed and the latch released so that it may move to inoperative position while the yielding surfaced brushes may be used to control the fresh roll which is now the running roll, the splicing having been completed, as it moves into the tension members. The operation of the reel motor is controlled by the limit switches 64 and the switch 76 and the limit switches operate to stop the reel motor when a predetermined amount of pressure against the web and fresh roll has been reached. The release of the knife for severing the web and of the latch which holds the brush arm in its operative position is accomplished by the motion of the same operating handle 65 which is used to bring the brush arm down to operating position. The arrangement is such as to insure a time interval between the tripping of the knife and the release of the latch so that there is little chance of the latch being released before the knife has penetrated the running web.

Although I have illustrated and described only one form of the invention I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited in this respect otherwise than as set forth in the claims, but what I do claim is:

1. In a web splicing apparatus, the combination with means for supporting the web roll being used and the fresh web roll and means for moving the supporting means to bring the fresh web roll into position for splicing, of a yieldingly swinging frame for backing up the web, and means whereby the yielding frame can be adjusted to present a predetermined pressure against the web and the roll for forcing them together to enable the running web to rotate the fresh web roll at web speed.

2. In a web splicing mechanism, the combination with a rotatable reel for supporting the web rolls, means for rotating the reel to bring the fresh web roll toward the running web, yielding soft surfaced means beyond the running web for backing it up at a point in the straight strand of the web running directly from the running web roll and forcing a contact under yielding pressure between the web and the fresh roll, and means whereby the degree of pressure can be adjusted so that the proper amount can be provided to enable the running web solely by its own motion to rotate the fresh web roll up to web speed in a fraction of a revolution.

3. In a web splicing device, the combination with a reel for supporting the fresh and running web rolls, of an arm movable toward and from the running web, a series of yielding surfaced web pressing means carried rigidly by said arm, an oscillatable shaft having an arm fixed thereon, spring connections between the two arms, which springs are capable of adjustment for the purpose of adjusting the pressure by which the means backs up the web at the time of splicing.

4. In a web splicing apparatus, the combination with means for supporting the web roll being used and the fresh web roll and means for moving the supporting means to bring the fresh web roll into position for splicing, of yielding means for backing up the web, means whereby the yielding means will present a predetermined pressure against the web and the roll, and means for stopping the web support moving means when the pressure against the web and the fresh roll as applied by the yielding means has been increased up to a predetermined limit.

5. In an apparatus for splicing webs, the combination of a frame mounted to swing about an axis into and out of operative position, a brush mounted on said frame in fixed position for bearing on the web to be spliced and forcing it with yielding pressure against a fresh web roll, an operating arm mounted to turn on an axis, and yielding means connecting the frame with the operating arm, whereby the turning of the operating arm will turn the brush frame.

6. In a splicing device for a printing machine, the combination of a pivoted frame, a yielding surfaced web engaging means carried by said frame, a counterweight for the frame located above its pivot having a projection extending therefrom, a pivoted operating arm, yielding means for engaging said projection to connect the operating arm with the counterweight yieldingly, yielding means for connecting the weight and frame, a pivoted arm having a latch projecting therefrom, and a projection on the weight for engaging the latch and holding the weight in operative position.

7. In a splicing device for a printing machine, the combination of a pivoted frame, a yielding surfaced web engaging means carried by said frame, a counterweight for the frame located above its pivot, an operating arm pivoted on the same axis as said frame, yielding means for connecting the operating arm with the counterweight yieldingly, an arm pivoted on a different axis and having a latch projecting therefrom and a toe fixed with respect to the latch, a projection on the weight for engaging the latch and holding the frame in operative position, a stop on the operating arm for engaging the toe on the latch and limiting the position of the operating arm, means for limiting the motion of the latch in each direction, and a stop for limiting the motion of the weight and frame.

8. In a splicing device for a printing machine, the combination of a pivoted frame, a brush carried by said frame, a counterweight for the frame located above its pivot having a projection extending therefrom, an operating arm pivoted on the same axis as said frame, yielding means for engaging said projection to connect the operating arm with the counterweight yieldingly, yield-

ing means for connecting the frame and weight, an arm pivoted on a different axis and having a latch projecting therefrom and a toe fixed with respect to the latch, a projection on the weight for engaging the latch and holding the weight in operative position, a stop on the operating arm for engaging the toe on the latch and limiting the position of the operating arm, means for limiting the motion of the latch in each direction, and a stop for limiting the motion of the weight and frame to operative position.

9. In a web splicing device for a printing machine, the combination of a pivoted frame, yielding surfaced means on the frame for engaging the web and holding it with yielding pressure, a pivoted arm, a rod connected to the arm, a spring on the rod, a guiding device carried by the frame for said rod and constituting means for receiving the end of the spring, the rod having means for adjusting the compression of said spring, and an operating arm rigidly connected with the first named arm for controlling the operation of the frame, through the yielding connection of the first arm and frame.

10. In a web splicing device for a printing machine, the combination of a pivoted frame, a yielding surfaced brush on the frame for engaging the web and holding it with yielding pressure, an arm pivoted on the same axis as the said frame, a rod pivoted to the end of the arm, a spring on the rod, a guiding device carried by the frame for said rod and constituting means for receiving the end of the spring, and an operating arm pivoted on the same axis and connected with the first named arm for controlling the operation of the frame.

11. In a web splicing device, the combination of a pivoted frame, a yielding surfaced brush carried thereby for engaging the web with yielding pressure, an arm pivoted on the same axis as the frame having a projection thereon, a limit switch on the frame in the path of the projection adapted to be operated thereby when the parts move to operative position, a reel for supporting the web rolls, a motor for operating the reel, means controlled by the limit switch for stopping the motor when it is operated as set forth, an operating arm pivoted on the same axis as the frame, a starting switch on the operating arm, and manually controlled means on the operating arm for closing the operating switch to start the motor.

12. In a web splicing apparatus, the combination with a movable fresh web roll and yielding means for backing up the web on the side opposite the fresh web roll, whereby the web and roll can be forced together with a yielding pressure before splicing to cause the web to rotate the fresh web roll, of a handle, a swinging arm on which the yielding means for exerting pressure on the web is mounted, means connected with the handle for swinging the arm toward the web, a web severing knife, means for releasing the knife for severing the web after the web has been spliced to the new roll, a latch for holding the arm down and means for releasing the latch after an interval of time has passed subsequent to the release of the knife.

13. In a web splicing device for a printing press, the combination of a pivoted frame, a brush carried by the frame for engaging the web with yielding pressure, means for operating said frame to operative and non-operative positions, a lever carried by said frame having a toe thereon, a rod pivoted to said lever, a web severing means, said rod normally holding the web severing means in inoperative position and an arm pivoted on the same axis as the frame and having a projection thereon in position to engage the lever when the arm moves into a certain position with respect to the frame to withdraw the rod from its position in which it holds the web severing means in inoperative position.

14. In a web splicing device for a printing press, the combination of a pivoted frame, soft-surfaced means carried by the frame for engaging the web with yielding pressure, means for operating said frame to operative and non-operative positions, a lever carried by said frame having a toe thereon, stationary means in position for engaging said toe to prevent motion of the frame away from operative position until a splice is completed, a rod connected with the lever, a web severing means normally held on the frame in operative position, a handle carried by the frame and having a cam thereon provided with a stop projection adapted to be engaged by the end of said rod except when it is operated by the lever to hold the web-severing means in inoperative position, means to move the web-severing means to operative position when released by the withdrawal of the rod, and a projection on said frame operating means in position to engage the lever when the frame operating means moves into a certain position with respect to the frame to withdraw the rod from its position in which it holds the web severing means in inoperative position.

15. In a web splicing apparatus, the combination of a rotatable roll-supporting reel, web splicing means movable to operative and inoperative positions, means for rotating the reel so that the web-splicing means forces the web against the fresh roll, and means controlled by the force exerted by the web-splicing means against the web and fresh roll for stopping rotation of the reel.

16. In a web-splicing apparatus, the combination of a member movable to operative and inoperative positions, web-splicing means and web severing means carried by said member, means for latching the movable member in operative position, and means for insuring operation of the web severing means before releasing the latching means.

17. In a web-splicing device, the combination of a rotary web roll support, a yielding surfaced member against which a roll on said support is adapted to force the running web between them, rigidly mounted arms, yielding means between said arms and said member, and means for holding said member in substantially stationary position, whereby the time at which the impact, and therefore the splicing, will take place is determined by the diameter of said web roll.

HENRY A. WISE WOOD.