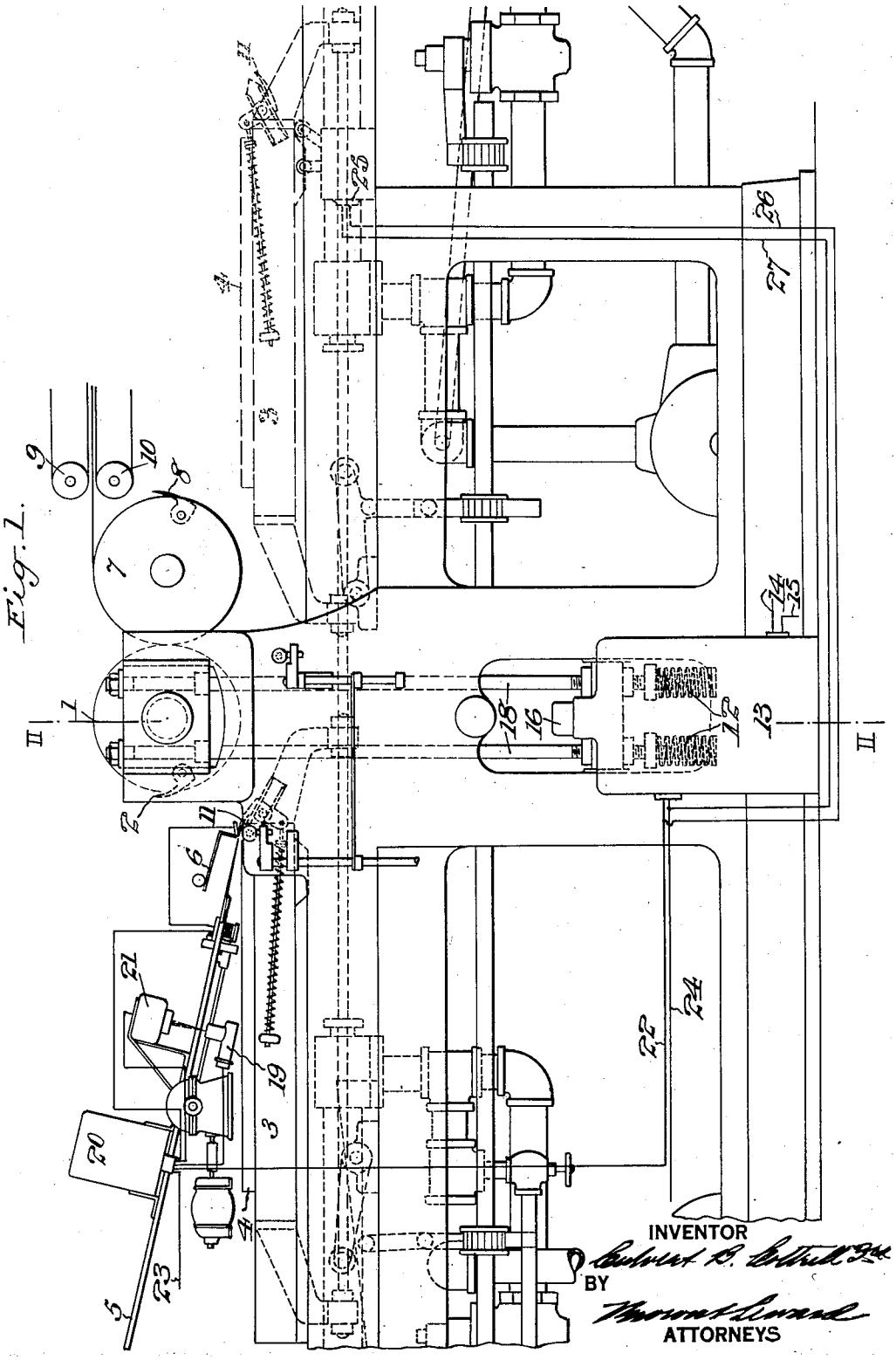
July 30, 1935. C. B. COTTRELL, 3D 2,009,686

BED AND CYLINDER PRINTING PRESS

Filed May 11, 1933 2 Sheets-Sheet 1



July 30, 1935. C. B. COTTRELL, 3D 2,009,686

BED AND CYLINDER PRINTING PRESS

Filed May 11, 1933 2 Sheets-Sheet 2

Fig. 3.

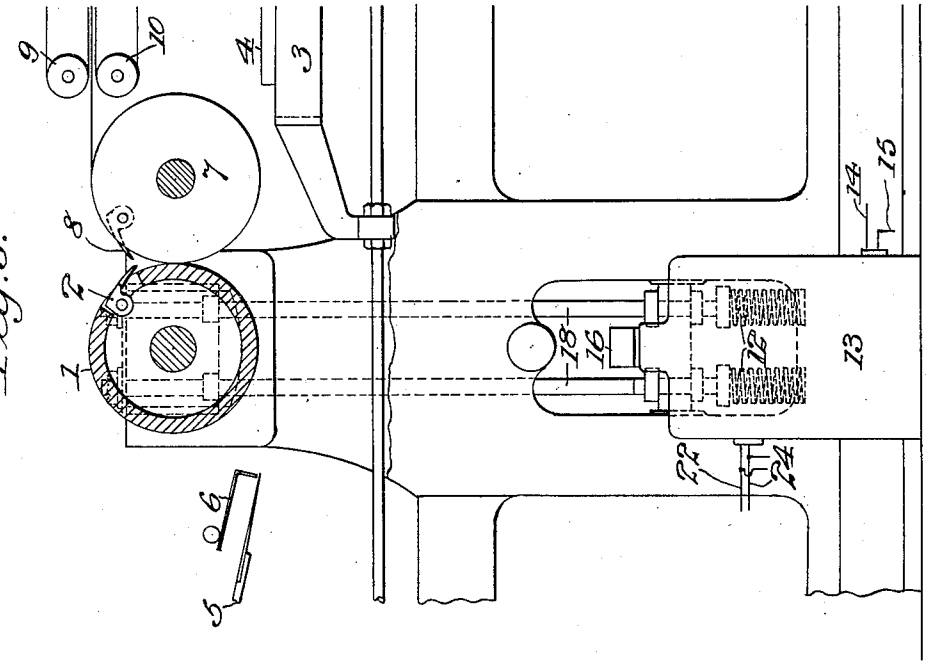
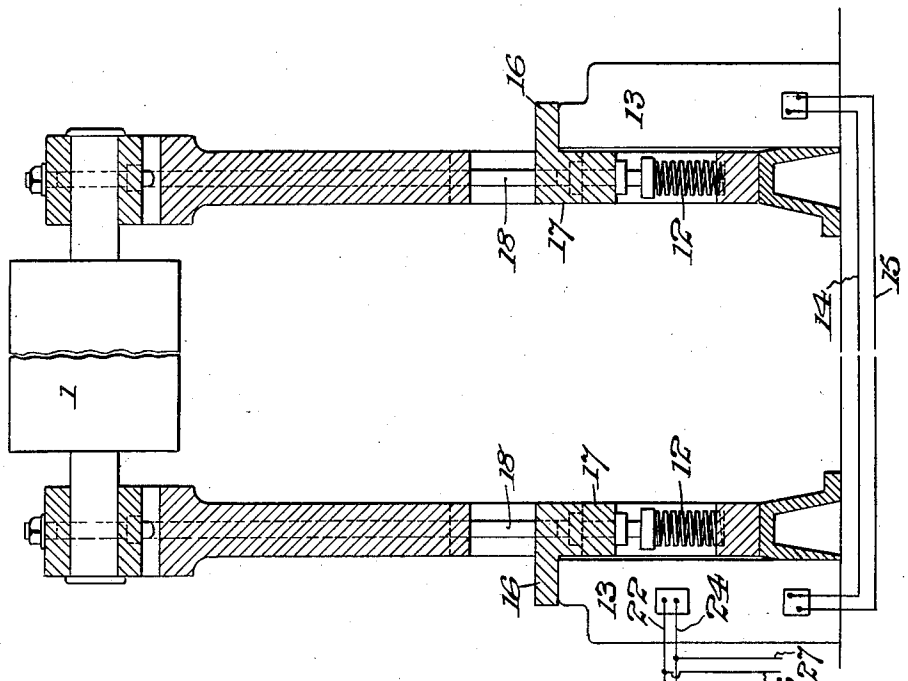


Fig. 2.



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Patented July 30, 1935 2,009,686

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BED AND CYLINDER PRINTING PRESS

Calvert B. Cottrell, 3d, Westerly, R. I., assignor to C. B. Cottrell & Sons Company, Westerly, R. I., a corporation of Delaware

Application May 11, 1933, Serial No. 670,407

8 Claims. (Cl. 101—283)

My invention is directed broadly to novel means for bringing the bed and cylinder into printing coaction providing a sheet has been fed to the press, said bed and cylinder remaining out of said printing coaction should a sheet fail to be fed to the press.

My invention is more particularly directed to a printing press of the above character in which means are provided for normally separating the bed and cylinder and means including a light responsive device, as a photoelectric unit, and an electromagnet in circuit therewith being provided for bringing the bed and cylinder into printing coaction; means operated by the bed as it finishes its printing stroke being also provided for deenergizing the electromagnet to allow the bed and cylinder to be separated on the non-printing stroke of the bed.

I have chosen to illustrate my invention in connection with the bed and cylinder printing press which forms the subject matter of my copending application filed February 2, 1933, Serial No. 654,855, and also in connection with the sheet registering device which forms the subject matter of my copending application filed December 17, 1932, Serial No. 647,714.

A practical embodiment of my invention is represented in the accompanying drawings, in which:

Fig. 1 represents my improved bed and cylinder printing press in side elevation, the parts being shown in full lines in the positions they assume as a sheet is about to be taken from the feeder by the form bed grippers on the printing stroke of the bed, and in dotted lines in the positions they assume as the bed reaches the end of its printing stroke;

Fig. 2 represents a detail vertical cross section taken in the plane of the line II—II of Fig. 1, looking in the direction of the arrows, the impression cylinder being shown held down in its printing coactive position with respect to the form bed by the energization of the electromagnets;

Fig. 3 represents a detail side elevation partly in section, showing the positions of the parts when the form bed is at the end of its printing stroke, the electromagnets being deenergized and the impression cylinder lifted away from its printing coaction with the bed; and Fig. 4 represents a complete wiring diagram of the embodiment herein represented in Fig. 1.

The oscillating impression cylinder is denoted by 1 and its set of grippers by 2. The reciprocating bed is denoted by 3 and its form by 4. The sheet feeder, denoted by 5, is provided with the usual sheet stop 6, said feeder being located at one side of the impression cylinder 1. The delivery which is located at the other side of the impression cylinder includes, in the present instance, a rotary sheet carrier 7 provided with a set of grippers 8 arranged to take the printed sheets from the grippers 2 of the impression cylinder 1 and to deliver the sheets at the top of the rotary carrier to the coacting endless tape carriers 9, 10.

The reciprocating form bed 3 is provided with a set of tumbler actuated grippers 11 which operate on the printing stroke of the bed, to take the sheets from the feeder 5 after they have been registered and to transfer the sheets to the impression cylinder grippers 2 at the bottom of the cylinder, as shown, described and claimed in my said copending application filed February 2, 1933, Serial No. 654,855.

The several grippers may be operated in any well known or approved manner at the proper times and their operating means are not shown and will not be specifically described herein.

Means are provided for normally lifting the impression cylinder away from its printing coaction with the form bed, said means in the present instance comprising expansion springs 12, 12, acting on the cylinder lifter bars 18, 18.

Electrically controlled means are provided for bringing the impression cylinder 1 down into its printing coaction with the form bed 3 on the printing stroke of the bed, providing a sheet has been fed from the feeder to the bed grippers 11. The said means in the present instance comprises two electromagnets 13, 13, electrically connected by the circuit wires 14, 15, to operate in unison. The armatures 16, 16 of these electromagnets are carried by the cross heads 17, 17, attached to the cylinder lifter bars 18, 18.

The energization of these electromagnets 13, 13 is under the control of a light responsive device, as a photoelectric unit, which is in turn controlled by the registry of the sheet on the feeder, as is clearly set forth in the my said copending application filed December 17, 1932, Serial No. 647,714. This photoelectric unit which acts as a side guide for the sheet comprises, generally, the following elements: The photoelectric tube 19 is electrically connected to the photoelectric relay 20 of any well known or approved form. This photoelectric tube 19 is positioned beneath the feed table 5 in the path of a beam of light projected from the lamp 21. This relay 20 is electrically connected to one of the electro-

magnets 13 through the circuit wire 22 and to a source of electric current supply, not shown herein, through the main line wire 23. The circuit wire 24 leads to one of the electromagnets 13 from the said source of electric current supply.

The electromagnets 13, 13 are deenergized by means of a circuit maker and breaker, as for instance a switch 25 by which the current is broken when the form bed reaches the end of its printing stroke, to cause the springs 12 to lift the impression cylinder 1 away from its printing coaction with the form bed 3 on the non-printing stroke of the bed. This switch 25 is shown as connected by the circuit wires 26, 27 with the wires 22 and 24 respectively.

It will be understood that if no sheet is fed to the form bed grippers 11 on the printing stroke of the bed the electromagnets 13 will remain deenergized, thus allowing the springs 12 to hold the impression cylinder 1 in its raised position out of printing coaction with the form bed. If, however, a sheet is fed to the bed grippers 11 the side registering of the sheet will, through the photoelectric unit, cause the energization of the electromagnets 13, thus bringing the impression cylinder down against the tension of its lifting springs 12, into printing coaction with the form bed.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not wish to be limited to the particular embodiment herein shown and described, but

What I claim is:

1. In a bed and cylinder printing press, an impression cylinder, a reciprocating form bed, means normally separating the bed and cylinder, sheet feed controlled means for bringing the bed and cylinder into printing coaction for the printing stroke of the bed, and means for causing the bed and cylinder separating means to operate to separate the bed and cylinder as the bed finishes its printing stroke.

2. In a bed and cylinder printing press, an impression cylinder, a reciprocating form bed, means normally separating the bed and cylinder, sheet feed controlled electrically operated means for bringing the bed and cylinder into printing coaction for the printing stroke of the bed, and a circuit breaker operated by the bed for causing the bed and cylinder separating means to operate to separate the bed and cylinder as the bed finishes its printing stroke.

3. In a bed and cylinder printing press, an impression cylinder, a reciprocating form bed, means normally separating the bed and cylinder, sheet feed controlled means including a photoelectric unit and an electromagnet in circuit therewith for bringing the bed and cylinder into printing coaction for the printing stroke of the bed, and means for deenergizing the electromagnet to cause the bed and cylinder to be separated as the bed finishes its printing stroke.

4. In a bed and cylinder printing press, an impression cylinder, a reciprocating form bed, means normally lifting the cylinder from the bed, sheet feed controlled means for bringing the cylinder down into its printing coaction with the bed for the printing stroke of the bed, and means for causing the cylinder lifting means to operate to raise the cylinder from the bed as the bed finishes its printing stroke.

5. In a bed and cylinder printing press, an impression cylinder, a reciprocating form bed, means normally lifting the cylinder from the bed, sheet feed controlled electrically operated means for bringing the cylinder down into its printing coaction with the bed for the printing stroke of the bed, and a circuit breaker operated by the bed for causing the cylinder lifting means to operate to raise the cylinder from the bed as the bed finishes its printing stroke.

6. In a bed and cylinder printing press, an impression cylinder, a reciprocating form bed, means normally lifting the cylinder from the bed, sheet feed controlled electric means including a photoelectric unit and an electromagnet in circuit therewith for bringing the cylinder down into its printing coaction with the bed for the printing stroke of the bed, and means for deenergizing the electromagnet to cause the cylinder to be raised from the bed as the bed finishes its printing stroke.

7. In a bed and cylinder printing press, an impression cylinder, a reciprocating form bed, means normally separating the bed and cylinder a sheet feed controlled photoelectric unit and an electromagnet in circuit therewith and adapted to be energized thereby for bringing the bed and cylinder into printing coaction for the printing stroke of the bed, and an electric switch operated by the bed as the bed finishes its printing stroke to deenergize the electromagnet, to permit the cylinder and bed to be separated.

8. In a bed and cylinder printing press, an impression cylinder, a reciprocating form bed, means normally lifting the cylinder from the bed, a sheet feed controlled photoelectric unit and an electromagnet in circuit therewith and adapted to be energized thereby for bringing the cylinder down into its printing coaction with the bed for the printing stroke of the bed, and an electric switch operated by the bed as the bed finishes its printing stroke to deenergize the electromagnet, to permit the cylinder to be lifted.

CALVERT B. COTTRELL, 3D.