

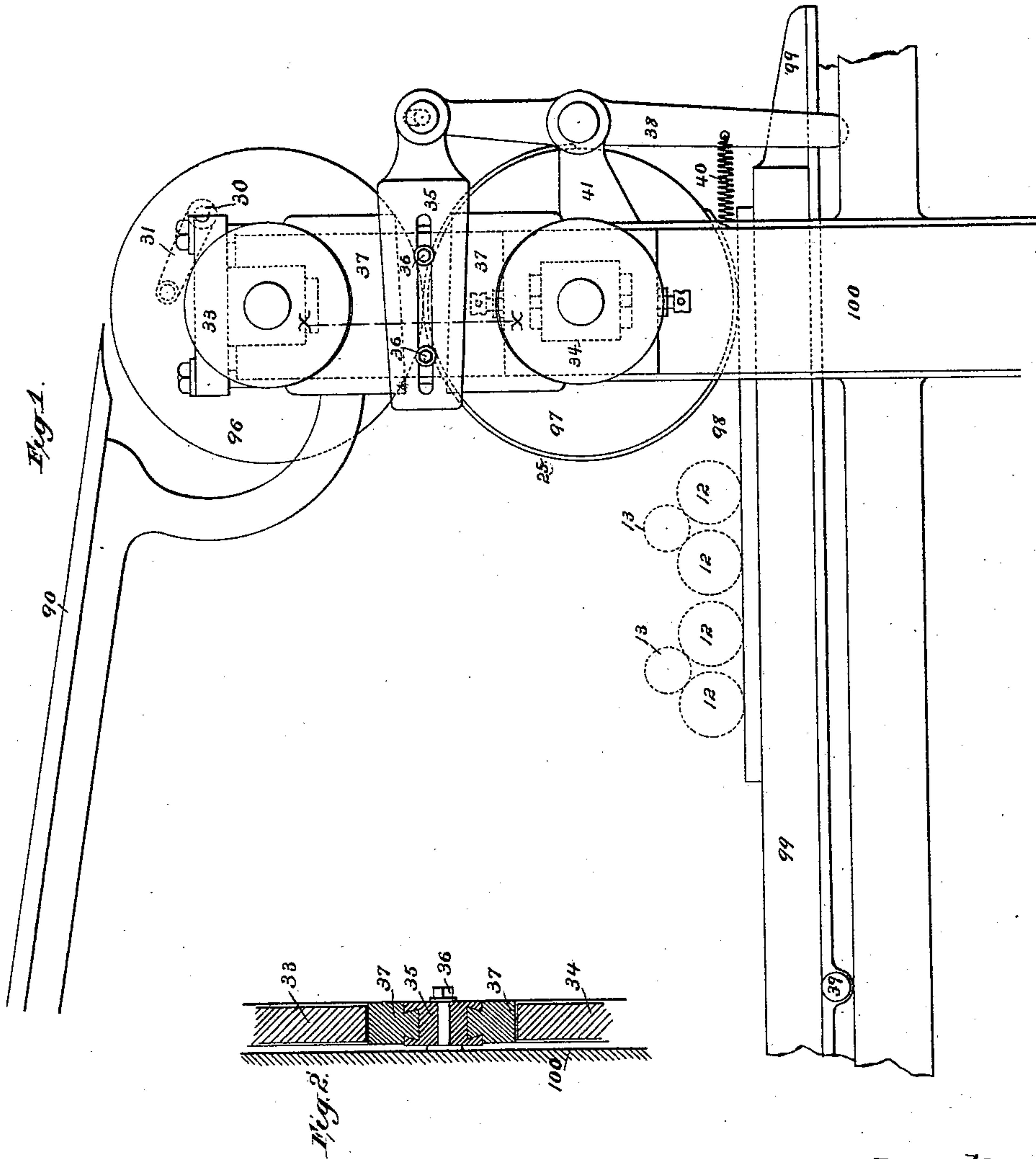
(No Model.)

2 Sheets—Sheet 1.

D. M. SOMERS.  
CYLINDER PRINTING PRESS.

No. 454,776.

Patented June 23, 1891.



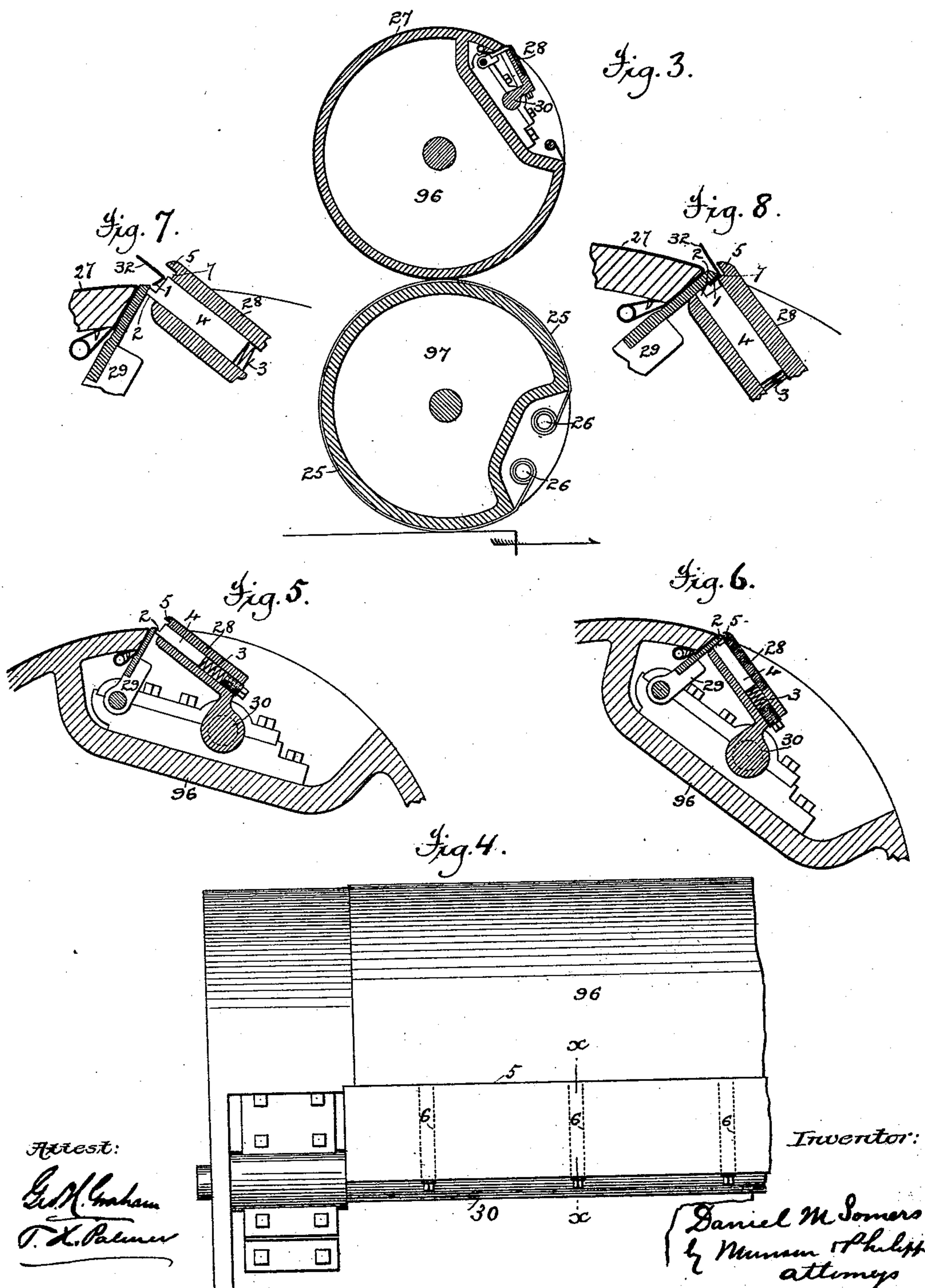
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*Daniel M. Somers*  
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# UNITED STATES PATENT OFFICE.

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J. L. SOMERS, G. A. SOMERS, W. H. ATKINSON, AND E. E. SOMERS, ALL  
OF SAME PLACE.

## CYLINDER PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 454,776, dated June 23, 1891.

Application filed March 27, 1884. Serial No. 125,668. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL M. SOMERS, a citizen of the United States, residing in the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Cylinder Printing-Presses, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates generally to that class of printing-machines which are known as "stop-cylinder presses," but more particularly to those machines of this class which are designed for lithographic printing, it being the object of the invention to produce a machine of this character which shall be especially adapted for use in printing upon sheets of tin or other thin metal plates or substances which are of a rigid or unyielding nature.

The invention consists in the provision, in conjunction with the transfer mechanism of a printing-press, of means for aiding the stop mechanism employed with such transfer mechanism in overcoming the momentum of the printing-cylinders, so as to prevent undue strain upon said stop mechanism, and it also includes a gripper mechanism by which a perfect register of the sheet with relation to the printing-surface is effected without the aid of a separate registering mechanism, and by which also the sheet is raised from the cylinder, so as to be readily removed after being printed.

The invention also consists in certain details in the construction of the stop mechanism and the gripper mechanism, all of which will be hereinafter fully explained.

In the accompanying drawings, Figure 1 is a partial side elevation of an ordinary stop-cylinder lithographic-printing machine, showing the parts thereof which embody the present invention. Fig. 2 is a sectional detail taken upon the line *xx* of Fig. 1. Fig. 3 is a vertical cross-section of the printing-cylinders. Fig. 4 is a partial plan view, upon an enlarged scale, of the impression-cylinder. Figs. 5 and 6 are sectional details taken upon the line *xx* of Fig. 4, showing the construction of the sheet-gripper, said gripper being

shown in its open and closed positions, respectively. Figs. 7 and 8 are like views upon a still larger scale, the former showing a sheet in position to be taken by the gripper and the latter the same after the gripper has closed upon it.

Referring to said figures, it is to be understood that the frame-work 100, which supports the various parts of the press, is of the usual construction and is provided with ways or bearings upon which the bed 99 reciprocates in the manner common in this class of presses. The bed 99 is provided with the usual means for carrying the stone 98, and is moved to and fro upon its ways by means of mechanism similar to that shown in United States Letters Patent No. 272,604, or by any of the other mechanisms commonly used for this purpose in this class of presses.

The press is provided with the usual damping apparatus (not shown) for wetting the stone 98 before the ink is applied, and also with the usual inking mechanism, of which only the distributing-rolls 13 and form-rolls 12 are shown, for applying the ink to the stone.

In machines of this class as heretofore constructed the sheet to be printed has been carried upon an impression-cylinder which was mounted above the bed in such position that as the latter reciprocated the sheet was carried into contact with the stone. In printing upon metal plates, however, or other hard and unyielding substances, or upon rough or uneven surfaces, this method has not in practice proved entirely satisfactory, because the unyielding nature of both the printing-surface and the surface printed upon prevented the ink from being brought into contact with all portions of the surface upon which the impression was to be made. To overcome this difficulty I cause the impression to be first taken from the stone onto a transfer-cylinder, which is mounted in the position usually occupied by the impression-cylinder and is provided with a yielding surface formed by stretching a blanket of rubber or other similar material tightly around the cylinder. The impression thus taken by the transfer-cylind-



der is then given to the sheet, which is carried upon an impression-cylinder mounted so as to revolve in contact therewith.

The transfer-cylinder 97 is mounted in up-  
5 right portions of the frame-work 100, and is provided with the usual adjustable journal-boxes by which the position of the cylinder can be properly adjusted with relation to the stone upon the bed. This cylinder is also  
10 provided with a driving and stop mechanism, (not shown,) which may be similar to that described in the Letters Patent before referred to, or of any of the other well-known forms of mechanism for this purpose.

15 To effect the proper transfer of the matter which is to be printed from the stone to the sheet upon the impression-cylinder, the transfer-cylinder is provided with a blanket 25, of rubber or other similar material, which covers the greater part of its surface and has its  
20 ends secured to ordinary tightening-rolls 26, mounted in the heads of the cylinder and provided with the usual means for stretching and holding the blanket taut.

25 The impression-cylinder 96 is mounted above the transfer-cylinder, and is also provided with adjustable journal-boxes by which it can be properly adjusted with relation to the transfer-cylinder, the two cylinders being  
30 connected by suitable gears, so as to revolve in unison. The impression-cylinder may be provided with a thin blanket or tympan 27, arranged in the usual manner; but this is not necessary, as the blanket upon the transfer-  
35 cylinder is sufficiently yielding to bring the ink of the design into contact with all parts of the sheet.

The impression-cylinder 96 is provided with a gripper 28 for taking and carrying the  
40 sheets around upon the cylinder, and with the usual stationary jaw 29, upon which the gripper closes. The gripper 28 is mounted upon a rock-shaft 30, journaled in the heads of the cylinder, and is closed to grasp the sheets at  
45 the proper times by means of a spring, (not shown,) which is arranged in the usual manner, it being opened to release the sheets by means of a moving cam, (also not shown,) which is operated in the usual manner, so as  
50 to engage with a rock-arm 31 upon the end of the gripper-shaft 30. The gripper 28, instead of being of the common construction, consists of a continuous bar or plate, which extends the entire length of the cylinder and  
55 is provided with a short projecting jaw 5, which, when the gripper is closed, extends over the stationary jaw 29, as shown in Figs. 6 and 8. The portion of the plate or bar 28 beneath the jaw 5 forms a shoulder 7, against which  
60 the leading end of the sheet is placed, and which bar serves as a gage to bring the sheet into proper register. The bar composing the body of the gripper is provided with a number of transverse openings 6, in which are seated  
65 the discharging-pins 4, which are constantly pressed outward and yieldingly held against the jaw 29 by springs 3. The ends of the pins

4 are recessed, so as to leave short projections 2, the purpose of which will hereinafter appear.

As has been before stated, the cylinders 96 70 97 are geared together, so as to revolve in unison, while the cylinder 97 is provided with the usual driving and stop mechanism—that is to say, mechanism by which the cylinders are rotated while the bed 99 is moving in one 75 direction, but are arrested and held stationary while the bed is moving in the opposite direction.

In operating this machine at a high rate of speed it has been found that the momentum 80 of the two cylinders is so great that the sudden stopping of them at the end of the stroke of the bed occasions too great a strain upon the stop mechanism. To avoid this sudden strain upon the stop mechanism, I have pro- 85 vided a brake to aid in overcoming the momentum of the cylinders as the bed 99 arrives at the end of its stroke in one direction. To accomplish this the shafts of the cylinders are extended beyond the frame-work at one side 90 of the machine and are provided with pulleys 33 34, (see Figs. 1 and 2,) between which is located a wedge 35, which moves freely upon studs 36, projecting from the frame-work, and acts upon the inclined edges of a pair of 95 blocks 37, which are arranged to bear upon the peripheries of the pulleys 33 34. The blocks 37 are provided with tongues, (see Fig. 2,) which enter dovetail grooves in the edges of the wedge, so as to hold the blocks in posi- 100 tion. The wedge 35 is connected to one end of a lever 38, which is fulcrumed in an arm 41, extending from the frame 100, and has its other end in position to be engaged by a stud 39, which projects from the side of the bed 105 99, and is so positioned as to engage the lever and force the blocks against the pulleys 33 34 just before the bed arrives at the end of its stroke after having given an impression to the blanket upon the transfer-cylinder. 110 The lever 38 is provided with a spring 40, which is arranged as shown in Fig. 1, or in any other convenient position, and which acts, as the bed commences its return-stroke, to rock the lever in the opposite direction, so as 115 to withdraw the wedge 35 and move the blocks 37 away from the pulleys 33 34.

The operation of the machine is as follows: After the cylinders 96 97 have been arrested the sheet 32, of tin or other substance, which 120 is to be printed, having been previously bent so as to provide a narrow downwardly-projecting flange 1 at its forward end, will be placed under the jaw 5 and against the registering-shoulder 7 of the gripper 28, as shown 125 in Fig. 7, the shoulder 7 of the gripper thus serving as a perfect feed-guide to secure the proper register between the sheet and the design to be printed. After the bed has moved backward, so as to ink the stone, the cam 130 which holds the gripper open will be moved so as to allow the gripper to close and grasp the sheet, as shown in Fig. 8. As the bed commences to move forward, the cylinders



will commence to move also, so that the sheet 32 will be carried off the feed-table 90, and at the same time the impression upon the stone 98 will be transferred to the blanket 25, as shown in Fig. 1. As the cylinders continue their revolutions, the impression taken upon the blanket 25 will be carried around upon the cylinder 97, so as to be transferred to the sheet 32, carried upon the cylinder 96. As the bed 99 arrives at the end of its stroke, the stud 39 will engage with the lever 38, so as to force the blocks 37 against the pulleys 33 34 to aid in overcoming the momentum of the cylinders, and at the same time the cylinders will complete a revolution and be arrested by the stop mechanism. At or about the time that the cylinders are thus arrested the moving cam will open the gripper 28, as shown in Fig. 7, and as the gripper is opened the projections 2 upon the ends of the discharging-pins 4 will catch under the flange 1 and raise said flange out from in front of the jaw 29, so that the sheet can be readily removed and another inserted in position to be taken by the gripper when it is again closed. The pins 4, instead of abutting against the jaw 29, may, if preferred, enter and move in elongated recesses in said jaw, and in this case they need not be spring-seated or yielding.

Although, as before stated, this machine is especially designed for use in printing upon sheets of tin or other metal, yet it will be found well adapted for printing upon many kinds of paper or upon stiff materials, as card-board or sheets of wood, and particularly upon those kinds of paper or other substances which have a rough or uneven surface, as the blanket 25 will, by reason of its elasticity, carry the ink into all the depressions of the surface to be printed.

In conclusion it is to be remarked that, although the several features of construction hereinbefore described combine to form a very desirable machine for the purposes specified,

they will individually be found equally useful when employed in connection with other forms of co-operating mechanism. For example, the gripper mechanisms may be used with equally good results in a mechanism in which the sheet is printed directly from the stone or in a mechanism in which the stone is carried upon a revolving cylinder instead of a reciprocating bed. The transfer mechanism may also be used in connection with any other form of mechanism for carrying the stone.

What I claim is—

1. The combination, with the impression and transfer cylinders 96 97, of a frictional brake arranged to act upon said cylinders, and connections, substantially as described, for automatically operating said brake at the proper times to overcome the momentum of said cylinders, substantially as described.

2. The combination, with the bed 99, of the impression and transfer cylinders 96 97, provided with a friction-brake, and connections, substantially as described, by which the movement of the bed operates said brake at the proper time to overcome the momentum of said cylinders, substantially as described.

3. The combination, with the bed 99, provided with the stud 39, of the impression and transfer cylinders 96 97, provided with the pulleys 33 34, the blocks 37, wedge 35, and lever 38, substantially as described.

4. The combination, with the impression-cylinder, of the gripper 28, provided with the registering-shoulder 7, the projecting jaw 5, and the discharging-pins 4, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

DANIEL M. SOMERS.

Witnesses:

J. A. HOVEY,  
T. H. PALMER.