

No. 781,464.

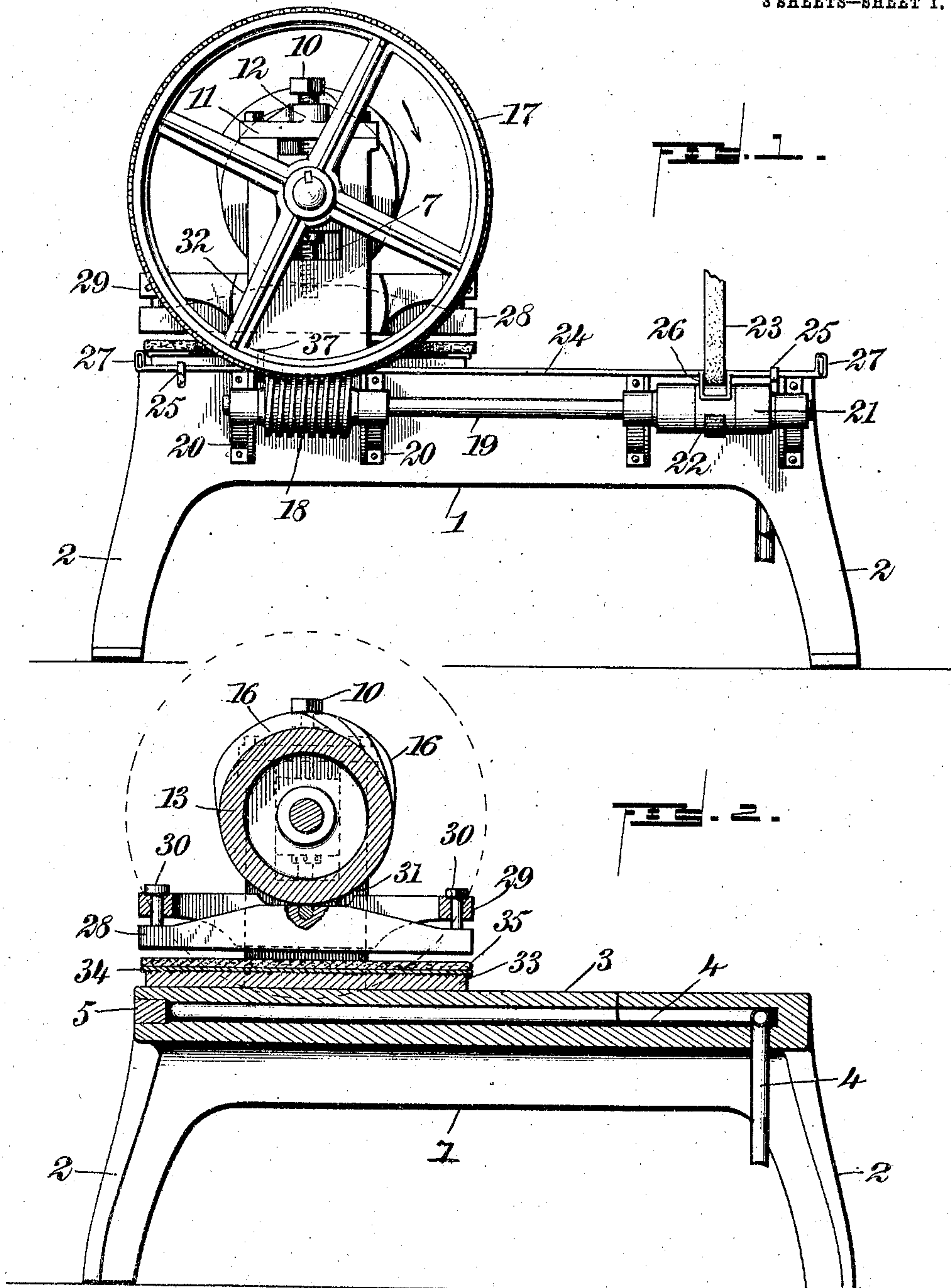
PATENTED JAN. 31, 1905.

F. SCHREINER.

MACHINE FOR IMPRESSING OR EMBOSSING AND DRYING STEREOTYPE
MATRICES.

APPLICATION FILED MAR. 26, 1904.

3 SHEETS—SHEET 1.



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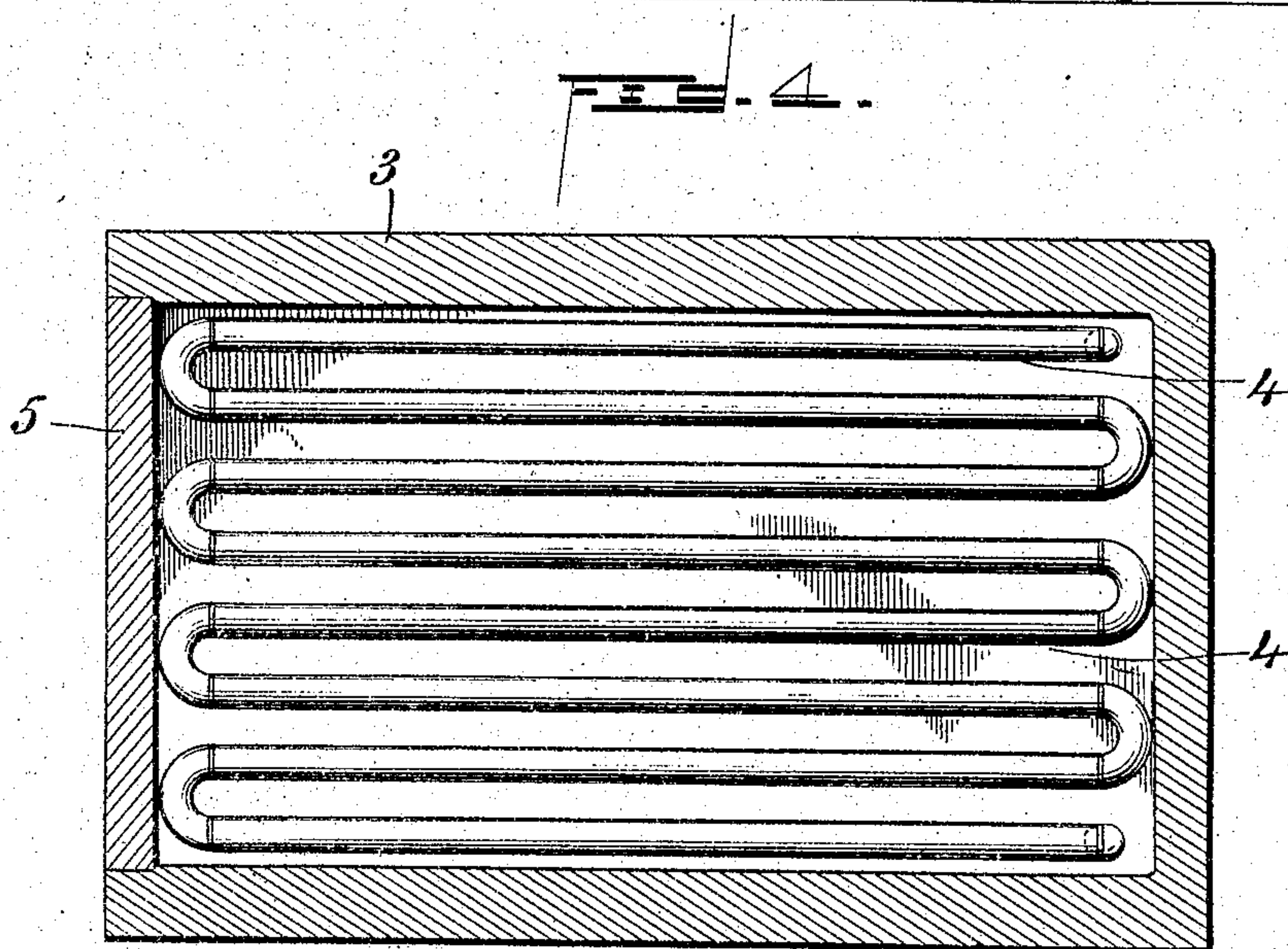
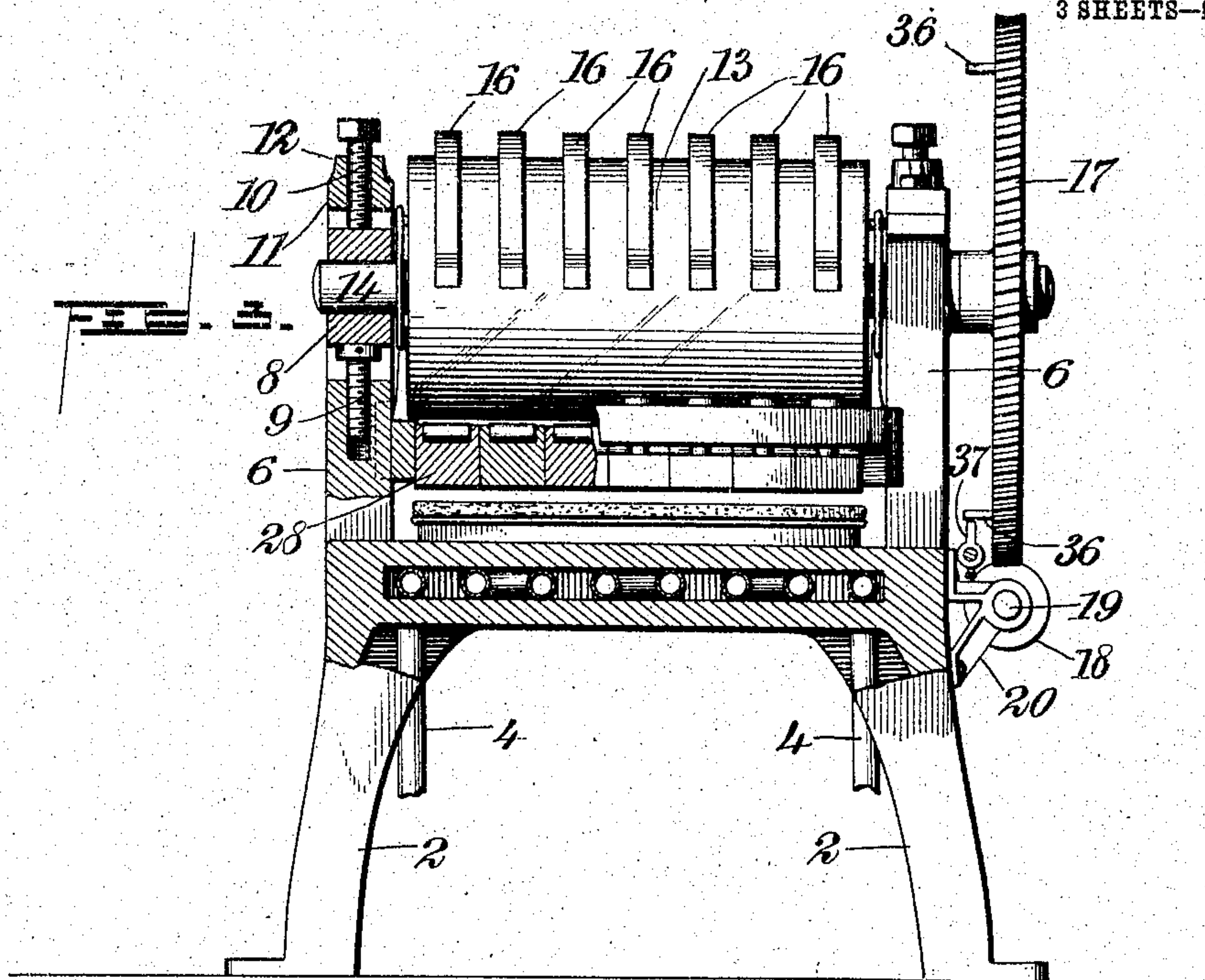
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3 SHEETS—SHEET 2.



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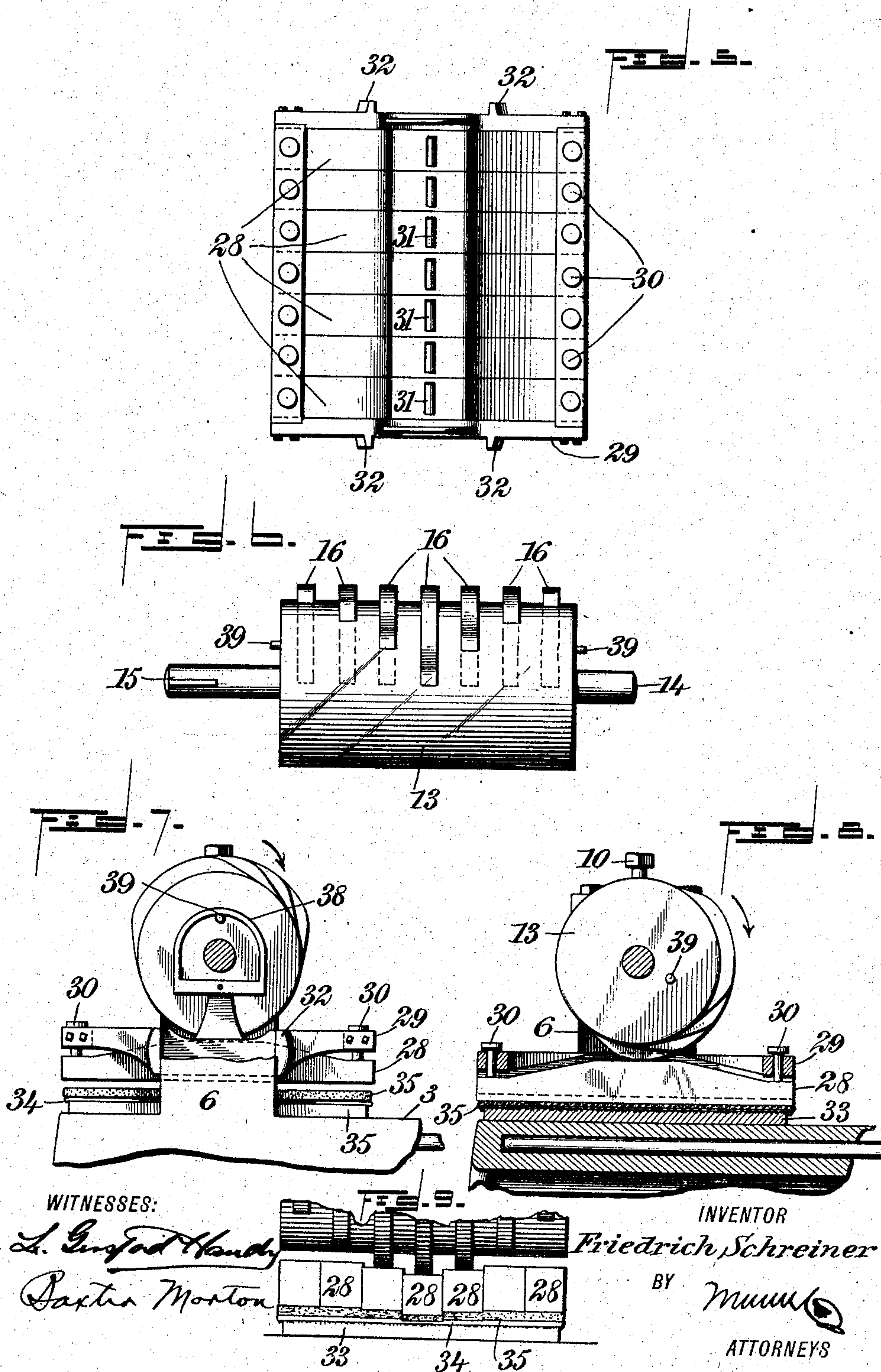
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3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

FRIEDRICH SCHREINER, OF PLAINFIELD, NEW JERSEY.

MACHINE FOR IMPRESSING OR EMBOSSING AND DRYING STEREOTYPE-MATRICES.

SPECIFICATION forming part of Letters Patent No. 781,464, dated January 31, 1905.

Application filed March 26, 1904. Serial No. 200,136.

To all whom it may concern:

Be it known that I, FRIEDRICH SCHREINER, a citizen of the United States, and a resident of Plainfield, in the county of Union and State
5 of New Jersey, have invented a new and Improved Machine for Impressing or Embossing and Drying Stereotype-Matrices, of which the following is a full, clear, and exact description.

This invention relates to a machine for simultaneously impressing or embossing and drying stereotype-matrices.

The object of the invention, stated in general terms, is to provide a machine characterized by simplicity of design, durability and
15 inexpensiveness in construction, and by means of which perfect stereotype-matrices may be simultaneously impressed or embossed and dried, thereby effecting a material saving of time and expense in the production of such
20 matrices.

In attaining the object above stated and others of related character, which will appear as the invention is more fully disclosed, I preferably employ a machine constructed as hereinafter described and having the novel features thereof clearly pointed out in the appended claims, it being understood that
25 changes in the form, proportions, and exact mode of assemblage of the elements of the machine may be made without departing from the spirit of the invention or sacrificing its advantages.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a view in side elevation of the machine with a body of type in position upon the bed thereof and a sheet of matrix-paper placed over the type in position to be impressed. Fig. 2 is a view in longitudinal section through the machine with the parts in the position indicated in Fig. 1. Fig. 3 is a view of the machine in end elevation looking
45 from the left of Fig. 1 with parts of the machine broken away to show internal structures. Fig. 4 is a horizontal sectional view through the bed of the machine, showing the preferred arrangement of the heating-pipes. Fig. 5 is a top plan view of the platen and

the frame thereof. Fig. 6 is a detail view in elevation of the cylinder with its cam-ribs. Fig. 7 is a detail view showing the operation of the mechanism for raising the platen. Fig. 8 is a detail view showing the operation of the cam-ribs upon the cylinder, and Fig. 9 is another detail view showing the operation of the cam-ribs upon the cylinder.

Referring to the drawings, 1 designates the frame of the machine, which is preferably constructed of cast-iron and is provided with supporting legs or standards 2. The bed 3 of the machine is preferably hollow, as shown in Figs. 2, 3, and 4, and is provided with heating devices, which consist, preferably, of steam-pipes 4, arranged as shown in Fig. 4. The chamber in the bed within which the heating-pipes 4 are arranged is preferably closed by a block 5, fitted in the end thereof.

At opposite sides of the bed 3 near one end of the machine uprights or standards 6 are provided. These uprights or standards are preferably of massive construction, as shown, and each is provided in the upper portion thereof with a vertically-arranged recess or slot 7 to receive a bearing-block 8, which is preferably adjusted in position by means of adjusting-screws 9 and 10, the screw 9 being mounted in a threaded socket formed in the upright or standard and the screw 10 being
80 mounted in a plate 11, provided with a boss 12 and secured upon the top of the standard or upright by screws or other suitable fastenings. The bearing-blocks 8 afford support for a cylinder 13, which has gudgeons 14 and 15 projecting from the ends thereof for engagement with the bearing-blocks 8, as shown in Fig. 3. The cylinder 13 is provided upon the surface thereof with a plurality of cam-ribs 16, arranged circumferentially and of different lengths, as shown best in Fig. 6. The cam-ribs 16 are provided with beveled extremities, and their rear extremities are alined, as shown in Fig. 3; but their forward extremities are disposed in the position shown in Fig. 6. The longest of the cam-ribs is placed midway between the ends of the cylinder, and the ribs gradually decrease in length from the middle of the cylinder toward the ends thereof. In order to impart rotative movement to the

cylinder, a worm-wheel 17 is rigidly mounted upon the end of the gudgeon 15 which projects beyond the bearing-block in which the gudgeon turns, and a worm 18 is provided to impart movement to the worm-wheel 17. The worm 18 is mounted upon a shaft 19, arranged at one side of the machine and supported in bearing-brackets 20. Near one end of the shaft 19 the worm 18 is mounted, as shown, and near the opposite end fast and loose pulleys 21 and 22, respectively, are mounted. A belt 23, driven from any suitable source of power, is arranged for travel over the pulleys 21 and 22 as desired to impart rotation to the shaft 19, and the position of the belt 23 upon the pulleys is determined by a belt-guide consisting of a rod 24, slidably mounted in suitable guide-loops 25 and having a loop 26, through which the belt 23 passes. The movement of the rod 24 in its guides is limited by the lateral projections 27 at its ends.

The cylinder 13 is provided for the purpose of applying pressure to the platen of the machine, by means of which the stereotype-matrix is pressed against the type or other surface to be reproduced. The platen, which is preferably used in the machine in connection with the cylinder 13, consists of a plurality of sections 28 of similar dimensions, which are disposed longitudinally of the machine beneath the cylinder 13 and are mounted beneath a frame 29, with which each of the platen-sections is connected by means of bolts 30 or other equivalent structures. As clearly shown in Fig. 2, the bolts 30 extend upward through the ends of the frame 29 and permit a small amount of movement of the platen-sections relatively to the frame, the amount of movement being determined by the length of the bolts 30. Each of the platen-sections is preferably of the form shown in Fig. 2, and intermediate of its ends each of the sections is preferably provided with a transversely-arranged roller 31 in its upper surface, the utility of which will presently appear. The frame 29 is arranged for vertical reciprocatory movement above the bed 3 of the machine, being guided by the uprights or standards 6, which are arranged between projecting guide-lugs 32, formed upon the side of the frame 29. As the platen-sections 28 are connected with the frame 29 by the bolts 30, the platen-sections are also arranged for vertical movement, the nature of which will be clearly explained hereinafter.

The action of the platen-sections in impressing a sheet of matrix-paper upon the type or other surface to be copied is clearly shown in Figs. 8 and 9. The body of type is indicated at 33, and the sheet of matrix-paper 34 is shown as resting upon the body of type. Between the sheet of matrix-paper and the sectional platen a blanket 35 of suitable character is interposed to transmit the pressure of the platen-sections indirectly to the matrix-

paper and provide a somewhat elastic cushion between the platen-sections and the matrix-paper. The body of type having been placed in position upon the bed of the machine beneath the platen, with the sheet of matrix-paper and the blanket arranged above the body of type, the belt 23 is shifted from the loose pulley 22 to the fast pulley 21 on the shaft 19, and motion is then imparted to the shaft, from which it is transmitted through the worm 18 and the worm-wheel 17 to the cylinder 13, which is caused to rotate in the direction indicated by the arrows. The rotative movement of the cylinder is slow and it gradually brings the forward ends of the cam-ribs 16 into contact with the rolls 31, provided upon the platen-sections 28. The longest of the ribs, which lies midway between the ends of the cylinder, is first brought into engagement with the corresponding platen-section, which is immediately depressed. Then the ribs adjacent to the middle rib engage the platen-sections upon either side of the middle platen-section and depress them. As the cylinder 13 continues to turn the other cam-ribs are brought successively into engagement with the remaining platen-sections, the platen-sections nearest to the side bars of the frame being depressed last. After the cylinder 13 has made a half-revolution, starting from the position shown in Fig. 1, it is automatically stopped. The automatic stopping device employed consists of studs 36, provided on the inner face of the worm-wheel 17 at intervals of one hundred and eighty degrees, and a lug 37, projecting upward from the rod 24 of the belt-guide and adapted to be engaged by the studs 36 as the worm-wheel revolves. As shown in Fig. 1, one of the studs 36 has just passed the lug 37 and has left the belt 23 upon the loose pulley 22, so that motion is no longer transmitted to the shaft 19 to rotate the cylinder 13. When it is desired to start the machine, the rod 24 must be retracted to shift the belt 23 onto the pulley 21 and bring the lug 37 into position for engagement by the other stud 36 as it passes the lowermost point of its path. The frame 29 is supported, when the cylinder 13 is in the position shown in Fig. 1, by means of hangers 38, provided at opposite sides of the frame and resting, when the ribs upon the cylinder are directed upward, upon studs 39, provided upon the ends of the cylinder 13. The rotation of the cylinder causes the studs to travel downward, as shown in Fig. 8, and the weight of the frame 29 causes it to descend so that its end pieces rest upon the platen-sections 28 and permit the platen-sections to be depressed by the engagement of the cam-ribs upon the cylinder therewith. When the rotative movement of the cylinder 13 is automatically stopped after the completion of a half-revolution from the position shown in Fig. 1, all of the cam-ribs are in operative engagement with the corresponding

platen-sections, and pressure is therefore applied over the entire surface of the matrix-paper. This pressure is maintained as long as may be necessary, the period being ordinarily approximately one minute. Then movement is again imparted to the shaft 19 by shifting the belt 23 into engagement with the pulley 21, and rotation is imparted to the cylinder by means of the worm and worm-wheel interposed between the shaft 19 and the cylinder. The rotative movement of the cylinder continues until it returns to the position shown in Fig. 1, when it is again automatically stopped by the engagement of one of the studs 36 with the lug 37 upon the rod 24. In returning to the position shown in Fig. 1 the cylinder 13 causes all of the cam-ribs 16 to pass simultaneously out of operative engagement with the platen-sections, so relieving the matrix-paper of all the pressure thereon, and it also brings the studs 39 into lifting engagement with the hangers 38, so raising the frame 29 and lifting the platen-sections upward to the extent shown in Fig. 7. After the return of the cylinder 13 to its original position the matrix will have been completely impressed and dried, so that it may be removed from the body of type or other surface copied and used in forming a replica of the surface impressed upon the matrix.

As compared with the other forms of apparatus heretofore employed in the formation of stereotype-matrices the machine above described presents several distinctive differences in operation, which will now be pointed out. The methods commonly employed in making stereotype-matrices are three in number: One method is to drive the matrix-paper down into the depressions presented by the surface to be copied by means of repeated blows with a brush. This method is objectionable on account of the time required for its practice, because great care is necessary to secure a uniform impression and because a blow which is a little too heavy may break the face of the matrix. Another method in common use is to impress the matrix-paper upon the body of type with a matrix-rolling machine, for which operation it is necessary to prepare the matrix-paper very carefully by moistening it to exactly the right degree, because when the paper is not moist or wet enough it will rise from the type-form during the rolling operation and when again depressed by the roller a double impression will be formed. This method of impressing stereotype-matrices is also objectionable, because there is always more or less sliding of the matrices occasioned by the to-and-fro movement of the roller thereon, and in consequence of this movement the impressions produced in the matrices are too shallow and are broader than the original, causing the stereotypes formed from such matrices to print heavier than the original type.

A third method of procedure in impressing stereotype-matrices is to subject the matrix-paper upon the body of type to uniform pressure by means of a single-platen press, for which operation an enormous pressure is required. The matrices formed in this manner are apt to be unsatisfactory, because they are almost always more deeply impressed at the margins than in the center. This difference in the depth of the impression is caused by the air which is present in the interstices and spaces of the type and is imprisoned therein by the matrix-paper when pressed downward upon the type at the margins of the form. Of course the air immediately adjacent to the margins of the form can escape almost completely when the platen of an ordinary single or full platen press is brought into operation; but the air in the interstices of the type near the center of the form is imprisoned and acts as a cushion between the matrix-paper and the type, so preventing the formation of a clear impression of that portion of the body of type.

Heretofore the matrices made by the several methods above outlined have been dried after the impression had been made by transferring the matrix and the type to a heated press, commonly called a "steam-table." When the type-form and the matrix are transferred to the steam-table, it not infrequently happens that the matrix is raised slightly from the type, and then the stereotypers have to use great care in screwing down the cover of the steam-table to insure the correspondence of the impression in the matrix with the type in the form, so as not to cause a double impression of the matrix while drying.

The improved machine which forms the subject of the present invention is designed to obviate all of the difficulties above enumerated, because the impression is produced at a single operation, as it is in a single or full platen press; but the pressure being first applied to the central portion of the matrix-paper any air-pressure in the interstices of the body of type is allowed to escape toward the sides of the form, so that a perfectly clear impression of the central portion of the body of type is obtained. The sections of the platen immediately adjacent to the middle section are then depressed, and the air in the interstices of these portions of the body of type is also allowed to escape laterally. The pressure is gradually extended, therefore, from the center or middle of the body of type toward the sides, and further opportunity is given for the escape of all the air present in the interstices of the type, so that a perfectly clear impression of the entire body of type may be obtained. After the several platen-sections have all been brought in operation the pressure thereon is maintained by the stopping of the rotative movement of the cylinder until the impression has set or until the matrix is dried.

Then the pressure is removed from all of the platen-sections simultaneously. As the matrix is then set and dried, it is unnecessary to transfer the form and the matrix to a steam-table for further heating, and all possibility of double impression is therefore avoided.

By means of the screws upon which the bearing-blocks 8 are held the bearing-blocks may be adjusted in position to regulate the pressure exerted upon the platen-sections to any desired degree, and by varying the period during which the pressure is maintained upon the matrix-paper exactly the proper period necessary to effect the drying of the matrix may be determined.

The arrangement of the platen-sections in the frame and the provision of the devices for automatically lifting the frame after the completion of the impression insure the removal of the pressure from the matrix-paper in such a way that no injury to the matrix results.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine of the class described in combination, a platen composed of sections, means for supporting type adjacent to said platen, and means for independently forcing said sections toward said type.

2. The combination in a machine of the class specified, of a platen having a plurality of sections, means for supporting type adjacent to said platen, and means for successively applying pressure to a plurality of the sections of the platen.

3. The combination in a machine of the class specified, of a platen having a plurality of sections, means for supporting type adjacent to said platen, and mechanism for successively imparting to a plurality of said sections the same degree of pressure.

4. The combination in a machine of the type specified, of a platen having a plurality of sections, means for successively applying pressure to a plurality of sections, and means for varying the degree of pressure imparted to the platen-sections.

5. The combination in a machine of the class specified, of a platen having a plurality of sections arranged side by side, means for supporting type adjacent to said platen, and means for imparting initial pressure to an intermediate section of the platen and for successively imparting pressure to the sections at the sides of said intermediate section.

6. The combination, in a machine of the class specified, of a platen having a plurality of sections, means for supporting type adjacent to said platen, and means for imparting initial pressure to one of said sections; gradually extending the pressure to all of the sections and maintaining the pressure upon all of the sections.

7. The combination in a machine of the type specified, of means for supporting a type-

form or the like, means for applying initial pressure to a portion of a stereotype-matrix, means for extending the pressure to all portions of the matrix, and means for removing the pressure from all portions of the matrix simultaneously.

8. The combination in a machine of the type specified, of a platen having a plurality of sections arranged side by side, means for supporting type adjacent to said platen, and a cylinder disposed transversely above said sections and arranged for rotation, said cylinder having a plurality of circumferential ribs upon its surface corresponding to the platen-sections.

9. The combination in a machine of the type specified, of a platen having a plurality of sections, and a rotative cylinder disposed transversely of said platen-sections and having a plurality of cam-ribs of different lengths arranged circumferentially on the cylinder and corresponding to said platen-sections.

10. The combination in a machine of the type specified, of a platen having a plurality of sections, and a rotative cylinder disposed transversely of said platen-sections and provided upon its surface with a plurality of cam-ribs circumferentially arranged, said cam-ribs being of different lengths and having their rear ends aligned and corresponding to the platen-sections.

11. The combination in a machine of the type specified, of a platen having a plurality of sections arranged side by side, and a rotative cylinder disposed transversely of said platen-sections and having upon its surface a plurality of cam-ribs corresponding to the platen-sections, the cam-ribs decreasing in length from the middle of the cylinder toward its ends.

12. The combination in a machine of the type specified, of a platen having a plurality of sections, means for applying pressure to one of said sections, means for extending the pressure to the remaining sections, and means for raising said sections after the pressure is removed.

13. The combination in a machine of the type specified, of a platen having a plurality of sections, a frame in which said sections are mounted for a limited movement independently of the frame, means for applying pressure to said platen-sections, and means for lifting said frame after the removal of the pressure from the platen-sections.

14. The combination in a machine of the type specified, of means for supporting a type-form or the like, means for imparting initial pressure to a portion of a stereotype-matrix, and gradually extending said pressure to the entire matrix, and means for automatically checking the movement of the pressure-applying devices when pressure is applied to the entire matrix.

15. The combination in a machine of the type specified, of a platen having a plurality of sections arranged side by side, a rotative cylinder

disposed transversely of said platen-sections
and provided with circumferential cam-ribs
corresponding to said sections and arranged
to engage a plurality of said sections suc-
5 cessively, and means for automatically stopping
the movement of said cylinder when all of the
ribs are in operative engagement with the
platen-sections.

In testimony whereof I have signed my name
to this specification in the presence of two sub- 10
scribing witnesses.

FRIEDRICH SCHREINER.

Witnesses:

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