No. 640,709. Patented Jan. 2, 1900.

R. H. SCOTT & H. C. TEEL.

AUTOMATIC SHEET FEEDING MECHANISM.

(Application filed Jan. 8, 1898.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

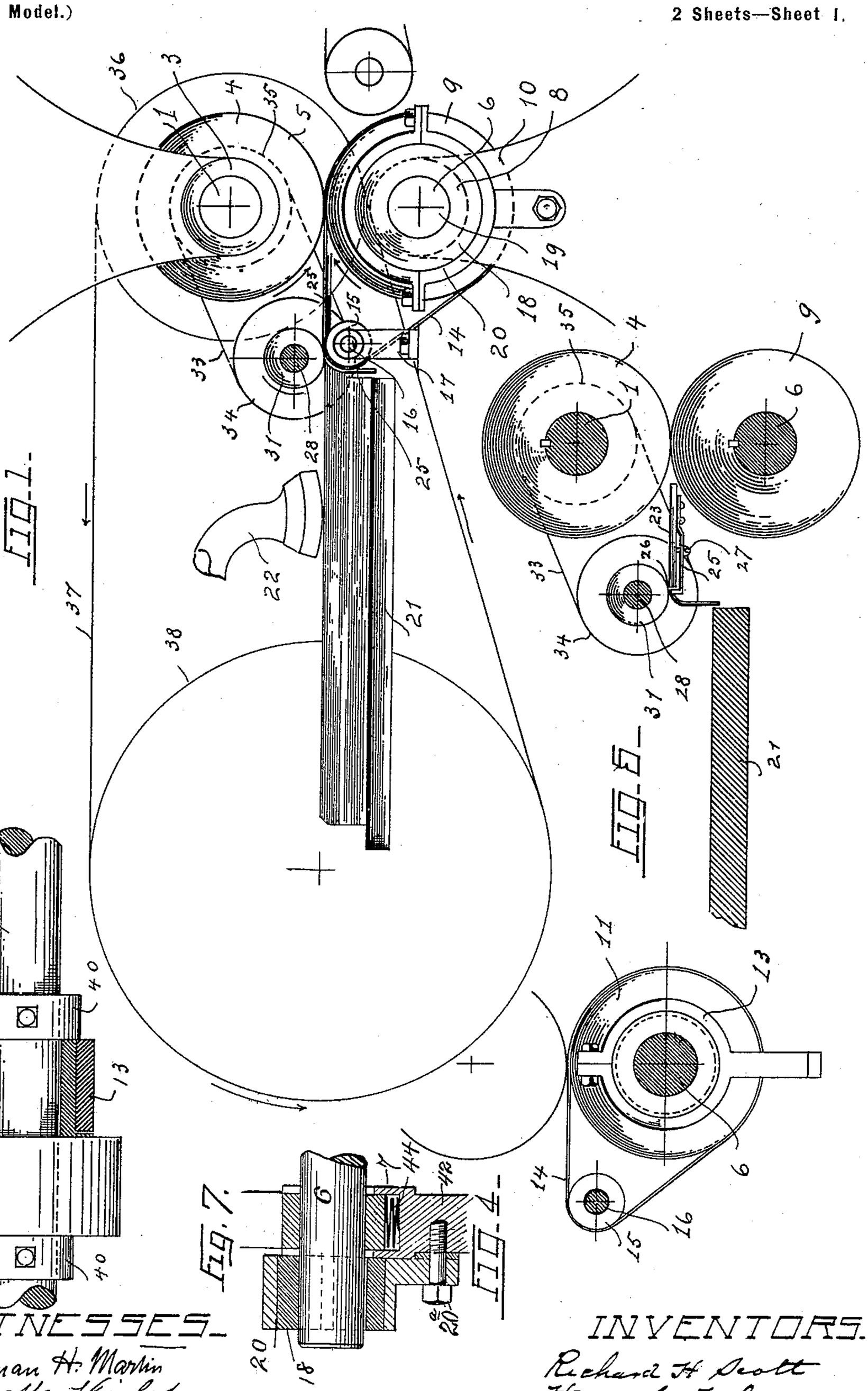

FIG. 6.

Fig. 7.

FIG. 5.

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(No Model.) 2 Sheets—Sheet 2.

FIG. 1.

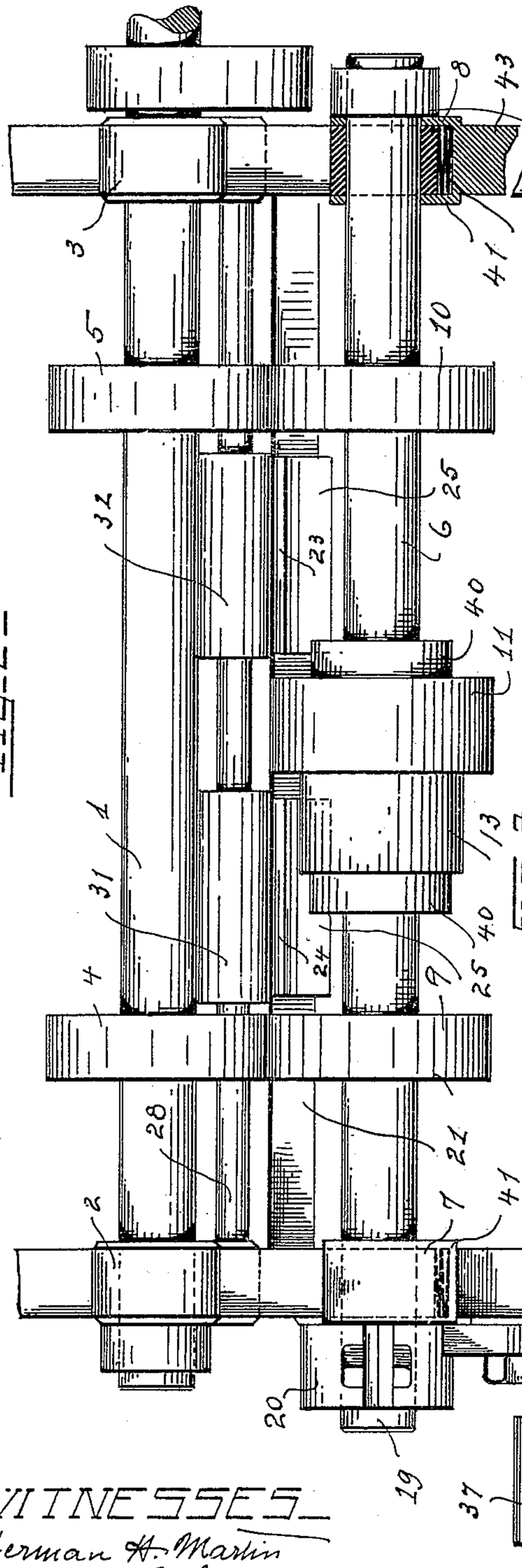
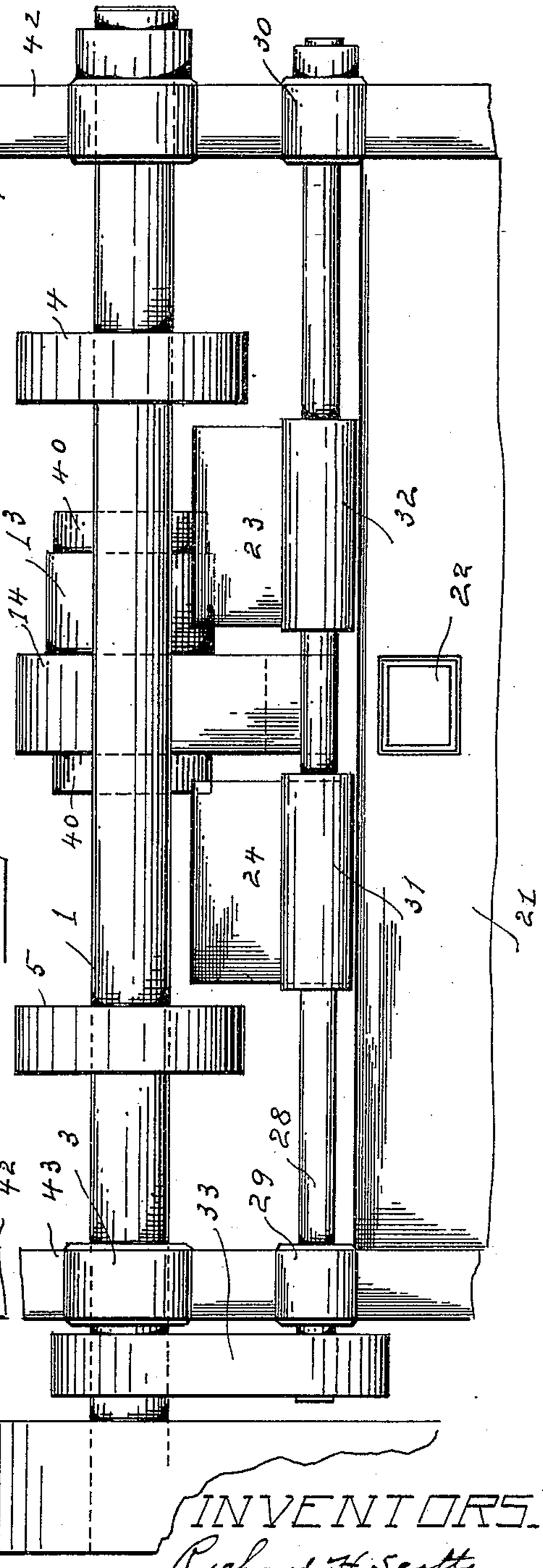


FIG. 2.



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UNITED STATES PATENT OFFICE.

RICHARD H. SCOTT AND HENRY C. TEEL, OF TOLEDO, OHIO.

AUTOMATIC SHEET-FEEDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 640,709, dated January 2, 1900.

Application filed January 8, 1898. Serial No. 666,021. (No model.)

To all whom it may concern:

Be it known that we, RICHARD H. SCOTT and HENRY C. TEEL, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Automatic Sheet-Feeding Mechanism; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form part of this specification.

Our invention relates to paper-feeding mechanism of that class used in connection with printing-presses for the general purpose of feeding a single sheet of paper from a stack of sheets.

The object of the invention is to provide an automatic sheet-feeding mechanism that shall be positive in the operation of periodically feeding a single sheet of paper to a registering device or directly to an impression-cylinder.

In the branch of the art to which this invention belongs the paper is placed upon a table vertically movable and automatically compensating for the number of sheets fed from the stack, the sheets being fed therefrom by timed mechanism to rolls from which they are delivered to the impression-cylinder. In this feeding operation it has too frequently occurred that more than one sheet has been delivered to the feeding-rolls, and consequently the printing-press, resulting in an injury to the mechanism and a blank in printing. By our improved mechanism we obviate this difficulty by providing frictionally-driven rolls in compensating contact with driving-rolls, whereby the normal feeding of one sheet results in a revolution of the upper and lower feeding-rolls. respectively, and by which an abnormal feed of more than one sheet results in mechanically retarding the revolution of the driven rolls. Consequently the delivery of more than one sheet to the impression-cylinder is obviated by preventing the revolution of the frictionally-driven rolls, thereby insuring the delivery of but the single sheet in contact with the driving-rolls. We have also provided platens located on either side and in advance of the carrier-belt and have secured upon the under side of the platens adjustable springs adapted to be depressed when more than one sheet is fed to the belt by the timed feeding-arm, and rollers journaled in juxtaposition with the edge of the platens, whereby the feeding of more than one sheet between the platens and rollers will cause the depression of the springs and cause the lower sheets to come in contact with gates formed by the edges or shoulders of the platens and be thereby retarded.

We have deemed it unnecessary to illustrate the operating mechanism for the feeding-table and the timed rectilinear reciprocating feeding-arm, as both devices are old and we make no claim to the same.

Our feeding mechanism is adapted for attachment to any printing-press, envelop-machine, ruling-machine, folder, &c.

We have attained the above-mentioned objects by a simplified form of mechanism, as illustrated in the drawings, in which—

Figure 1 is an elevation, partly in section, showing the feeding mechanism. Fig. 2 is a rear elevation. Fig. 3 is a top plan view. Fig. 4 is a detailed view of a portion of the feed mechanism, showing the frictional retarding mechanism for the carrier-belt pulley. Fig. 5 shows the separating and feeding rolls in their juxtaposition. Fig. 6 is a detail view, partly in section, of the frictional clutch mechanism shown in Fig. 4. Fig. 7 is a detail sectional view showing the clutch at the end of arbor 6.

In carrying out our invention we employ a positively-driven arbor 1, which is journaled in bearings 2 and 3, and upon this arbor 1 there are secured driving-rollers 4 and 5, having a resilient material secured upon their peripheries. In parallel alinement with the arbor 1 there is an arbor 6, journaled in compensating movable bearings 7 and 8, which cause rollers 9 and 10, secured to the arbor 6, to be held in continual contact with the positively-driven rollers 4 and 5, by which latter they are driven. Upon the arbor 6, intermediate the rollers 9 and 10 and adapted to revolve with or independently of the arbor, there is mounted a pulley 11, of a diameter substantially that of the rollers 9 and 10. The pulley 11 has fixed thereto a projecting hub 12,

adapted to be engaged by an adjustable friction-clutch 13, encircling the hub 12, whereby the revolution of the pulley 11 may be retarded to any degree. Upon the pulley 11 there is mounted a carrier-belt 14, which runs over a pulley 15, mounted upon an arbor 16, which is journaled in the bearings 17 and located in advance of the arbor 6, adjacent the rear end of the feed-table. A disk or ring 18 is fixed upon the end 19 of the arbor 6 and is encircled by an adjustable friction-clutch 20, which is stationarily held, as by bolt 20^a entering the frame 42.

21 designates a vertically-movable feed-table adapted to support a stack of paper, from which the upper sheet is fed to the rollers and carrier-belt 14 by means of a timed rectilinear reciprocating feeder-arm 22, which pushes the sheet toward the separating-rollers and holds the sheet until the rollers take hold thereof.

A sheet being fed to the separating-rollers will enter between rollers 4 5 and 9 10 and cause the frictionally-driven rollers 9 and 10 to revolve simultaneously with the positively-driven rollers 4 and 5. Should more than one sheet be fed by the feeding-arm 22 between the driving and driven rollers, the arbor 6 will be pressed downward in its compensating bearings and cause the ring 18, secured thereto to engage the stationarily-held friction-clutch 20, which will retard the movement of the arbor 6, and consequently the pulley 11 and carrier-belt 14, mounted upon the arbor 6, which will cause the retardation of the subjacent sheet by remaining stationary while the upper sheet is delivered to the impression-cylinder or registering device by the positively-driven rollers 4 and 5, which cause it to slide over the subjacent sheet. The latter is then delivered by the revolution of both rollers. The pulley 11 is also retarded in a similar manner by its hub 12 being forced into contact with the friction device 13.

As a further precaution against feeding more than one sheet we have provided platens 23 and 24, located upon either side of the separating-belt, and secured to the under side of the platen are springs 25, being bent upward near the end 26 of the platen and curved downward and adapted to be depressed, as shown in Fig. 5. The springs 25 are adjustable to any tension by means of screw-bolts 27. Slightly in advance of the gate formed by the edge 26 of the platen and vertically above there is journaled a driven arbor 28 in the bearings 29 and 30 and having mounted thereon feed-rollers 31 and 32, adjacent the platens 23 and 24. The rollers 31 and 32 are in parallel alinement with the platens 23 and 24, as shown in Fig. 5. The distance between the periphery of the roller and the platen is such as to allow the free passage of one sheet of paper; but should more than one sheet be fed the springs 25 will be depressed and the subjacent sheet or sheets will come in contact with the edge 26 of the platen and be held or retarded, preventing thereby the feeding of more than one sheet.

The arbor 26 is positively driven by means of a belt 33, running over a pulley 34, secured to the arbor 28, and the pulley 35, secured to the positively-driven arbor 1. 37 designates a belt running over the pulley 36 and the driving-pulley 38, the direction of revolution being indicated by arrows.

40 designates collars mounted on the arbor 6 and adapted to secure the pulley 11 in position.

In Fig. 1 we have illustrated a separating mechanism in accordance with the foregoing description, showing the rollers and platens in their juxtaposition with the top of the stack of paper upon the feeding-table, and we may provide a series of separating mechanisms progressively in the line of feeding, whereby the sheets are passed through a series of separating-rollers before being fed to the impression-cylinder. We may also construct a feeding mechanism without being provided with gates and separate the sheets by means of retarding all but a single sheet by friction. The adjustable bearings wherein the arbor 6 is journaled are located in the housings 41, formed in the frames 42 and 43, and have springs 44 interposed between the under side of the bearings and the housings, thereby allowing a vertically-compensating movement of the arbor.

It will be evident from the foregoing that when more than a single sheet is delivered between the driving and driven rollers the pressure upon the rollers 9 and 10 is such that the arbor 6 will be moved and cause the ring 18 and hub 12 to engage the friction devices 20 and 13, attached to the driven arbor 6, which will retard the arbor, with the result before stated. It will also be seen from the foregoing that we have devised a simple and inexpensive feeding and separating mechanism, and by mounting the arbor 6 in adjustable boxes any thickness of paper is compensated for. The friction devices or clutches are also made adjustable in any preferred manner to retard the revolution of the driven rollers to any extent.

What we claim is—

1. In an automatic sheet-feeding mechanism, the combination of a roller secured upon a driving-arbor, means for intermittently feeding a sheet of paper to said roller, a driven arbor in parallel relation thereto, having secured thereto a roller adapted to be driven by the roller secured to the driving-arbor, a friction device adapted to retard the revolution of the driven roller, whereby a single sheet causes the revolution of both the driving and driven rollers, and the sheet pressed upon by the driving-roller is delivered to the impression-cylinder while the surplus of sheets is held by the periphery of the retarded roller, and means for revolving the driving-roller, substantially as described.

2. In an automatic sheet-feeding mechan-

ism, a plurality of separating-rollers mounted on a driving and a driven arbor, means for intermittently feeding a sheet of paper thereto, the arbors being journaled in an attachable frame, means for retarding the driven rollers, a pulley mounted upon the driven arbor adapted to be retarded by friction, a belt upon said pulley, and a pulley which is journaled in advance of the driven arbor, the belt being in alinement with the line of feed of the sheets of paper, and the belt being adapted to carry a sheet to the separating and feeding rolls.

3. In an automatic sheet-feeding mechanism, a plurality of separating-rollers mounted upon a driving and driven arbor, means for intermittently feeding a sheet thereto, a pulley mounted upon the driven arbor, means for retarding the revolution of the pulley by friction, separate means for retarding the revolution of the driven arbor, a journal-box movably held in pockets formed in a frame, and means adapted to press the driven rollers against the driving-rollers whereby the thickness of paper is compensated for.

4. In an automatic sheet-feeding mechanism, a plurality of separating-rollers mounted upon a driving and driven arbor, means for intermittently feeding a sheet thereto, a carrier-belt mounted upon a separate and independently-revoluble pulley, means for retarding the driven arbor by friction, platens secured coincident with the top of the belt, rollers mounted upon an arbor journaled in the frame, mechanism in juxtaposition with the edge of the platens whereby a sheet is allowed to pass freely between the roller and the platen, springs secured to the under side of the platens adapted to be depressed when a plurality of sheets are fed to the roller and platen, whereby the adjacent sheets come in contact with the edge of the platen and are retarded thereby.

In testimony that we claim the foregoing as our own we hereby affix our signatures in presence of two witnesses.

RICHARD H. SCOTT.
HENRY C. TEEL.

Witnesses:
WILLIAM WEBSTER,
HERMAN H. MARTIN.

Disclaimer in Letters Patent No. 640,709.

DISCLAIMER.

640,709.—*Richard H. Scott and Henry C. Teel,* Toledo, Ohio. IMPROVEMENT IN AUTOMATIC SHEET-FEEDING MECHANISM. Patent dated January 2, 1900. Disclaimer filed November 3, 1900, by said patentees.

Enter their disclaimer—

"Of claim 1 of said Letters Patent, which claim is in the following words:

"'1. In an automatic sheet-feeding mechanism, the combination of a roller secured upon a driving-arbor, means for intermittently feeding a sheet of paper to said roller, a driven arbor in parallel relation thereto, having secured thereto a roller adapted to be driven by the roller secured to the driving-arbor, a friction device adapted to retard the revolution of the driven roller, whereby a single sheet causes the revolution of both the driving and driven rollers, and the sheet pressed upon by the driving-roller is delivered to the impression-cylinder while the surplus of sheets is held by the periphery of the retarded roller, and means for revolving the driving-roller, substantially as described.'"—[*Official Gazette, November 13, 1900.*]