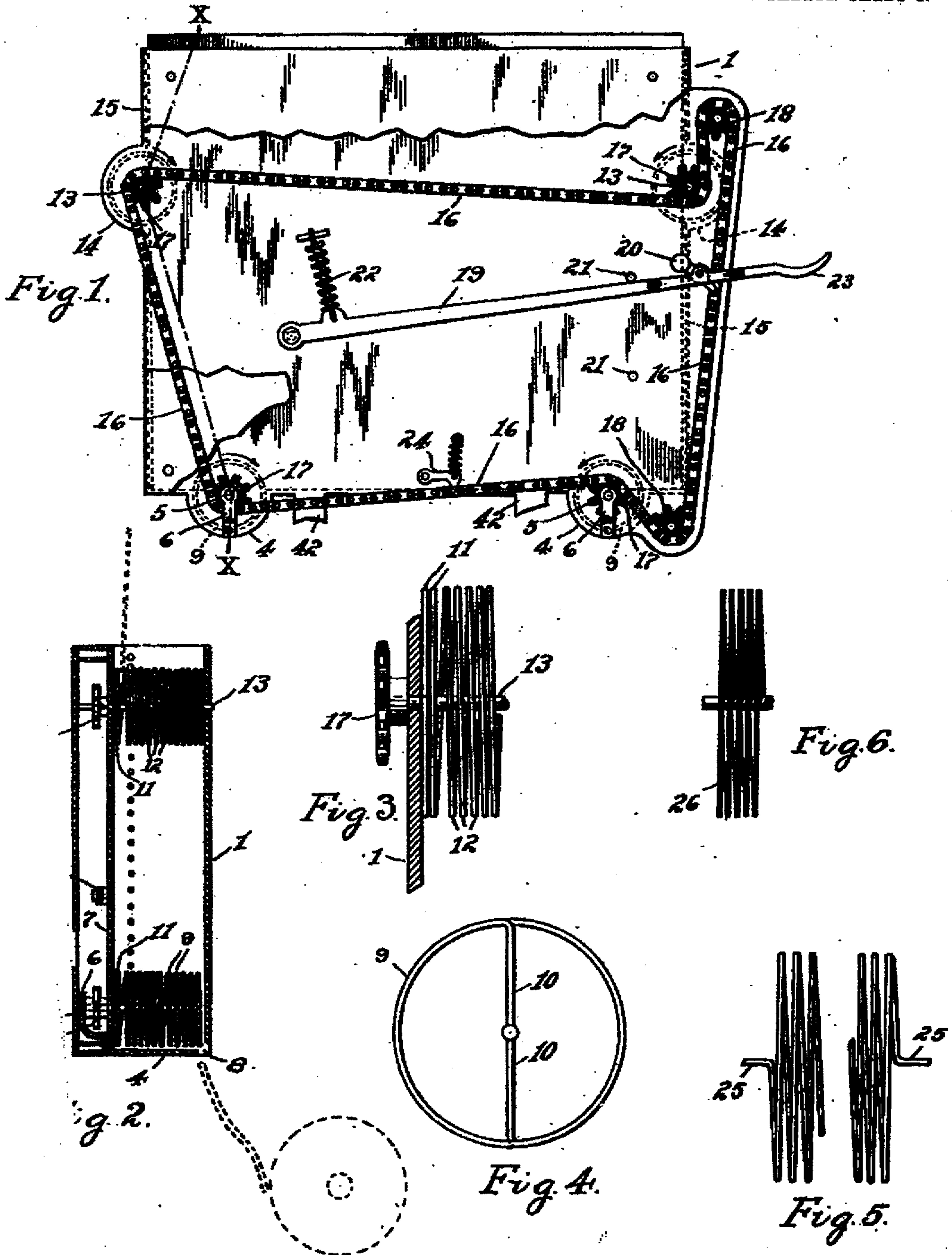


U. A. ABRAHAMS.
PAPER FEEDING DEVICE FOR TYPE WRITERS.
APPLICATION FILED MAR. 8, 1908.

934,126.

Patented Sept. 14, 1909.
2 SHEETS—SHEET 1.



WITNESSES:

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Dw.

INVENTOR
ULRICH A. ABRAHAMS

BY

[Signature]

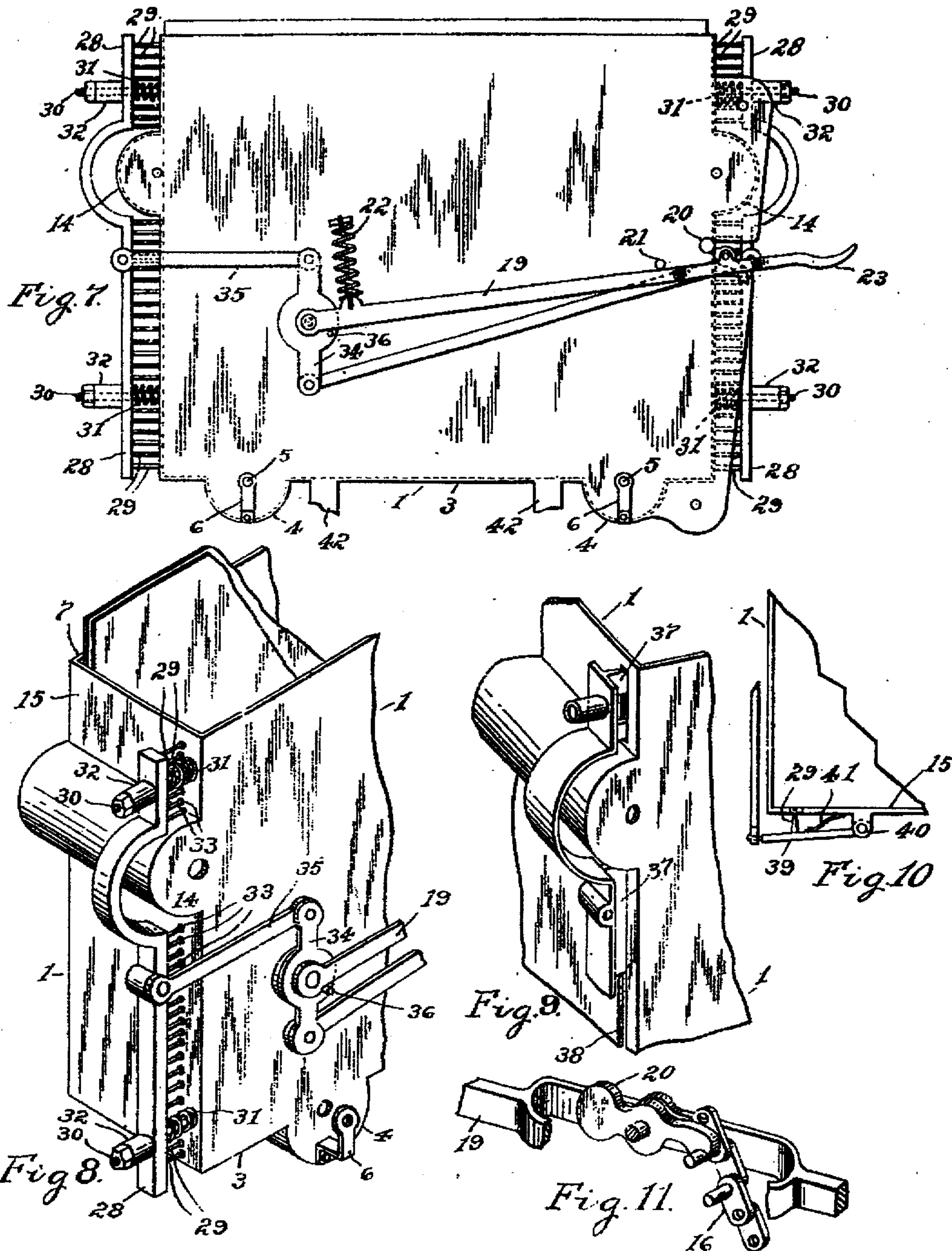
ATTORNEYS.

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UNITED STATES PATENT OFFICE.

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PAPER-FEEDING DEVICE FOR TYPE-WRITERS.

934,126.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed March 2, 1908. Serial No. 418,778.

To all whom it may concern:

Be it known that I, ULRICH A. ABRAHAMS, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Paper-Feeding Devices for Type Writers, &c., of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a feeder adapted to deliver sheets of paper, envelopes, cards or the like, *seriatim* to a typewriter, addressing machine or the like.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view in end elevation of a paper feeder embodying features of the invention, with a paper guide and its operating parts removed, to give clear view of the feeding mechanism. Fig. 2 is a view in section on or about line $x-x$ of Fig. 1. Fig. 3, is a view in detail of a conveyer helix. Fig. 4 is an end view of the helix. Fig. 5 is a view in detail of a helix without a spindle. Fig. 6 is a view in detail of a modified form of helix. Fig. 7 is a view in end elevation of the feeder showing paper guiding means and its connection to a lever operating the feeding mechanism, parts of the latter being omitted. Fig. 8 is a perspective view in detail, of a paper guide and connections. Fig. 9 is a view in detail of a modified form of the guide. Fig. 10 is a view in detail of a different mounting of the guides. Fig. 11 is a view in detail of a lever chain pawl.

Referring to the drawings, 1 indicates a substantially rectangular open top rack or casing, into which sheets of paper or the like may be dropped on end. This may be of thin sheet metal, as herein shown, or of any light material and suitable construction. The bottom or base 3 of the casing has a longitudinally disposed substantially semi-circular groove 4 or depression near each end in each of which is a horizontal shaft 5, its rear portion being journaled in an outer bearing bracket 6 and the rear wall 7 of the casing, and its forward unsupported portion extending to the edge of a transverse slot 8 in the bottom across the casing adjacent the front wall thereof at what may be styled the delivery end of the casing.

These shafts are preferably flush with the face of the casing bottom and each forms the core of a spring helix 9 secured concentrically thereon at its ends 10 only which are intumed radially and fastened to the shaft, the body of the helix riding on the bottom of the groove which acts as a guide therefor. These helices are preferably of fine spring wire, have an equal number of turns and are of opposite pitch. The two turns 11 of each coil adjacent the rear wall of the casing are closed on each other, while the next free turn is widely separated, the rest of the turn being regularly or evenly disposed.

Helices 12 each corresponding in pitch and disposition of turns to the adjacent lower coil, are carried by horizontal shafts 13 journaled in suitable bearing apertures in the front and back walls of the casing near the top thereof, the helices turning in guide grooves 14 in the side walls 15 similar to the bottom grooves 4, and the shafts being preferably flush with the outer faces of the walls.

The shafts 5 and 13 are rotated in unison by a sprocket chain 16 passing around sprocket wheels 17 keyed or secured to the outer rear shaft ends, idlers 18 directing the chain so that the sprockets on each side of the casing turn over toward the center thereof as indicated by the arrows. A lever 19 pivoted at its inner end on the back of the casing is slotted to embrace one of the stretches of the chain and a weighted or spring pressed pawl 20 thereon is adapted to engage the chain and move it on each down stroke of the lever. Stops 21 limit the throw of the levers so that each stroke rotates the sprockets once, and a spring 22 returns it to place.

The extended end 23 of the lever is shaped for a convenient finger pull readily reached by the operator of the machine on which the feeder may be mounted. A spring pressed pawl 24 holds the chain and sprocket against accidental movement, but yields to allow the chain to move when engaged by the lever.

The shaft driving mechanism may of course be replaced by suitable gears, transverse shafts with bevel pinions, or like means, although the chain drive is preferable. Similarly, the shafts of the helices may be omitted, as in Fig. 5, where the coil ends 25 are turned to form axial stub shafts on which the operating gears or sprockets are

mounted. Or the wire helices may be replaced by a solid screw 26 as shown in Fig. 6, with very deep thread.

To adapt the feeder for very thin sheets or sheets of considerable length, guides are provided to insure the introduction of the sheet into the first wide turns of the helices at the rear of the casing which may be considered the receiving end of the casing. A pair of bars 28 are each movably secured on the exterior of the casing in such manner that a row of stub pins 29 on each may be brought into parallel spaced relation with the rear wall of the casing, and thereby form in effect guide grooves on each side of the casing in alinement with the separated initial turns of the helices.

As a preferred form of construction, the bars are each slidable on a pair of parallel studs 30 on the outside of the casing, springs 31 holding them normally projected against the stud heads, and guide bushings 32 on the bars preventing twisting of the bars. Apertures 33 in the sides of the casing allow the pins 29 to enter the casing. Each end of a rock arm 34 pivoted on the ratchet or chain lever stud 35 is articulated by a link 35 to a guide bar 28. A stop 36 on the rock arm is so disposed as to be engaged by the chain lever as the latter is nearing the end of its down stroke to swing the arm and thus draw the bars inwardly so that the pins thereon project into the casing. When the lever is released and raised to initial position by its springs, the springs 31 withdraw the guide bar pins from the casing. The pins 29 on each bar may be replaced by a thin web or flange 37 (Fig. 10) in which case a slot 38 takes the place of the apertures 33. The rows of pins or the webs are interrupted to clear the upper helices and the bars are arched or otherwise disposed to avoid the upper helix grooves. It is evident that these bars might be mounted as indicated in Fig. 10 wherein they are slightly widened or made into wings 39 pivoted at their forward edges by hinges 40 with springs 41, their rear free edges being drawn in by the link and rock arm arrangement used on the other construction.

The feeder case has depending lugs 42 by which it may be secured on a typewriter or the like in such position that a sheet of paper dropped from its forward end passes directly into the machine, as indicated by the dotted diagram in Fig. 2.

In operation the parts are assembled so that when the lever is depressed, the guides are in, the wide turns of the side helices are opened inward and the same turns of the lower or bottom helices are open upward. At the same time, the forward end coils of the helices are so disposed as to allow a sheet to drop down through the bottom slot. While holding the lever depressed the oper-

ator drops a sheet of paper into the receiving end of the casing behind the guides, a stroke of the lever up and down advances the sheet one turn of the helices, another sheet is then dropped in, and so on until the feeder is fully charged, there being as many sheets as there are helix turns.

When needed for the typewriter, a stroke of the lever moves the sheet at the forward end of the casing over the slot in the base so that it drops through as the helices are turned out of its way. Thus the operator can supply his machine by merely touching the lever until the feeder is exhausted, making the device especially valuable for taking dictation directly on the typewriter, or transcribing from a telegraph receiver, or for other uses where it is inconvenient to continually interrupt the writer to replace a sheet.

The feeder may be made deep enough to take any standard sheet, additional side helices being added if necessary to better support the sheet. It may be likewise adapted for cards, envelopes or for manifolding, a set of the paper sheets and interposed carbons being placed between each turn.

The use of the spring helix is preferable to the solid screw as the light gage wire which may be used allows a very large number of sheets to be packed in a small space, while the yieldable spring clips which the coils constitute in effect allow for slight irregularities in the paper.

The proportions of the feeder may be varied to such different sized sheets and any capacity may be obtained by increasing the length of the helices or conveyers.

Obviously the details of construction may be varied without departing from the spirit of the invention, and I do not limit myself to any particular form or arrangement of parts.

A shield 43 may be secured to the rear wall 7 of the casing to cover the mechanism.

What I claim as my invention is:—

1. A machine for the purpose described comprising a casing conveying means therein adapted to engage a piece of sheet material at its margins and move it along the casing; means adapted to guide the sheet into engagement with the conveying means and means adapted to intermittently operate the conveying means and alternately therewith move the guiding means into operative relation to the conveying means.

2. A machine for the purpose described comprising a casing having a receiving and a delivery end, conveying means adapted to engage a piece of sheet material at its margins and to move it along the casing, means at the receiving end adapted to guide a sheet into engagement with the conveying means when moved into the path of travel of the sheets, and means adapted to intermittently

operate the conveying means and alternately therewith move the guiding means into operative relation to the conveying means.

3. A machine for the purpose described comprising a casing having a receiving and a delivery end, means therein adapted to engage pieces of sheet material introduced at the receiving end and move them in separated, spaced relation to the delivery end, and means adapted to guide a sheet into engagement with the conveying means when moved into the path of the sheets.

4. A machine for the purpose described comprising a casing having a receiving and a delivery end, conveying means therein adapted to engage pieces of sheet material introduced at the receiving end to move them in separated spaced relation to the delivery end and to release the sheets *seriatim* at the delivery end, and means adapted to guide a sheet into engagement with the conveying means when moved into the path of the sheets.

5. A machine for the purpose described comprising a casing having a receiving and a delivery end, conveying means therein adapted to engage pieces of sheet material introduced at the receiving end and move them in separated, spaced relation to the delivery end, means adapted to guide a sheet into engagement with the conveying means when moved into the path of the sheets, and means adapted to intermittently operate the conveying means and alternately therewith move the guiding means into operative relation to the conveying means.

6. A machine for the purpose described comprising a casing having a delivery aperture in its base, conveying means adapted to engage pieces of sheet material introduced into the casing, to move them on edge over the aperture and to release each sheet as it moves into vertical alinement with the aperture, and means adapted to guide a sheet introduced into the casing into engagement with the conveying means when said guiding means is moved into the path of travel of the sheet.

7. A machine for the purpose described comprising a casing having a delivery aperture in its base, and conveying means adapted to engage pieces of sheet material introduced into the casing, to move them on edge over the aperture and to release each sheet as it moves into vertical alinement with the aperture, means adapted to guide a sheet introduced into the casing into engagement with the conveying means when said guiding means is moved into the path of travel of the sheet, and means adapted to intermittently operate the conveying means and alternately therewith move the guiding means into operative relation to the conveying means.

8. A machine for the purpose described

comprising a casing, conveying means therein consisting of a plurality of rotatable helices adapted to simultaneously engage a piece of sheet material at its margins, means adapted to guide a sheet when introduced into the casing into engagement with the helices, when in the path of travel of the sheet, and means to rotate the helices in unison and move the guide in and out of operative relation to the helices.

9. A machine for the purpose described comprising a casing having a receiving and a delivery end, helical conveyers therein, means adapted to guide the margins of a piece of sheet material introduced at the receiving end of the casing between corresponding turns of the several helices when said guiding means is in the path of travel of the sheet axially of the helices, and means adapted to synchronously operate the helices and the guiding means.

10. A machine for the purpose described comprising a casing, helices journaled horizontally in the casing at the sides and lower portions thereof, means adapted to guide the margins of a piece of sheet material introduced into the casing between corresponding turns of the helices when the guiding means lies in the path of travel of the sheet axially of the helices, and means adapted to intermittently rotate the helices in unison and to alternately therewith move the guiding means into operative relation with the helices.

11. A machine for the purposes described comprising a casing, coiled spring helices journaled horizontally at their ends in the casing at the sides and lower portion thereof, means adapted to guide the margins of a piece of sheet material introduced into the casing between corresponding turns of the helices when the guiding means lies in the path of travel of the sheet axially of the helices, and means adapted to intermittently rotate the helices in unison and to alternately therewith move the guiding means into operative relation with the helices.

12. A machine for the purposes described comprising a substantially rectangular casing having a transverse delivery slot in its base near one end thereof, a set of helices extending longitudinally of the casing, means to rotate the helices in unison, movable means near the end of the casing remote from the slot adapted when projected to guide a piece of sheet material into engagement at its margins with the helices parallel to the slot, and means to intermittently rotate the helices and alternately therewith to project the guides into operative position.

13. A machine for the purposes described comprising a substantially rectangular casing having a transverse delivery slot in its base near one end thereof, helices journaled in grooves longitudinally disposed in the

sides and bottom of the casing, parallel guides on the casing adapted to be moved into the casing in a plane parallel to the slot and transverse to the axes of the helices and means adapted to operate the helices in unison and to move the guides into operative relation.

14. A machine for the purposes described comprising a substantially rectangular casing having a transverse delivery slot in its base near one end thereof, helices journaled in grooves longitudinally disposed in the sides and bottom of the casing, parallel guides on the casing adapted to be moved into the casing in a plane parallel to the slot and transverse to the axes of the helices, sprockets secured on the helix, journals, a sprocket chain connecting the sprockets, a ratchet lever operatively engaging the chain, a rock arm intermittently oscillated by the lever, and a link connecting each end of the rock arm with a guide.

15. A machine for the purposes described comprising a substantially rectangular open top casing having a transverse delivery slot in its base near one end thereof, a plurality of substantially semi-circular guide grooves on the inner faces of the sides and bottom of the casing extending from end to end thereof, a helix journaled in each groove on substantial axial coincidence therewith, a pair of parallel guides on the casing adapted to be moved into the casing parallel and close to the end wall remote from the slot, sprock-

ets on the journal of each helix, a sprocket chain meshing with the sprockets, a lever pivoted on the casing, a pawl therein adapted to engage the chain in the stroke of the lever, a rock arm journaled on the lever pivot adapted to be oscillated by the lever, and a link articulating each guide with an end of the rock arm.

16. A machine for the purposes described comprising a casing having a delivery slot in the base across one end, and parallel, longitudinal, substantially, semi-circular grooves in the sides, and base, a spring helix journaled at its ends in each groove in substantial axial coincidence therewith, bearing on the groove face throughout its length a sprocket secured on the journal of each helix a pair of parallel guides on the casing adapted to be moved into the casing parallel and close to the end wall remote from the slot, sprockets on the journal of each helix, a sprocket chain meshing with the sprockets, a lever pivoted on the casing, a pawl therein adapted to engage the chain in the stroke of the lever, a rock arm journaled on the lever pivot adapted to be oscillated by the lever, and a link articulating each guide with an end of the rock arm.

In testimony whereof I affix my signature in presence of two witnesses.

ULRICH A. ABRAHAMS.

Witnesses:

A. M. DORR,
C. R. STICKNEY.