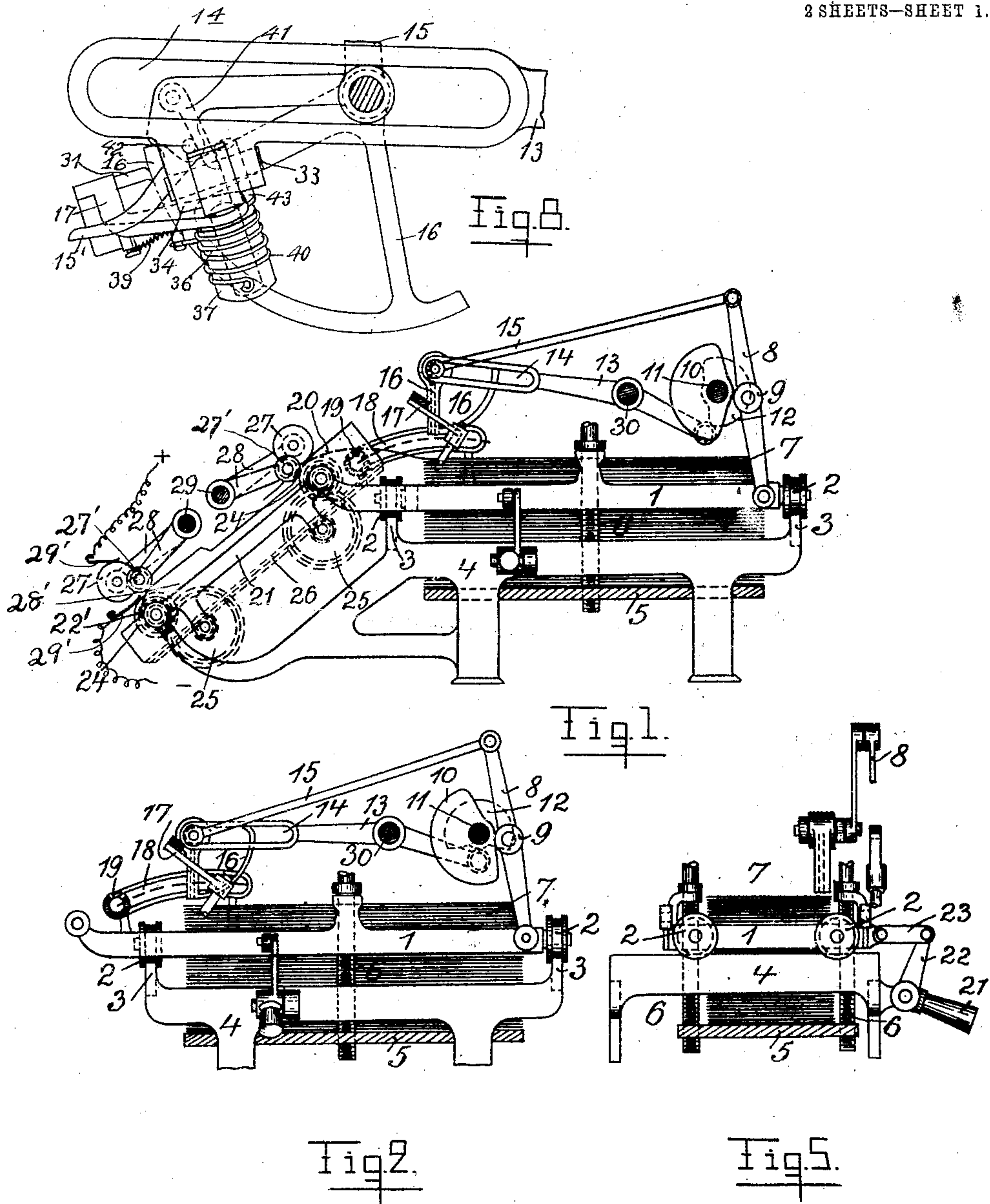


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SHEET SEPARATING DEVICE FOR PRINTING AND SIMILAR MACHINES.
APPLICATION FILED NOV. 19, 1907.

931,227.

Patented Aug. 17, 1909.

2 SHEETS—SHEET 1.



WITNESSES
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2 SHEETS—SHEET 2.

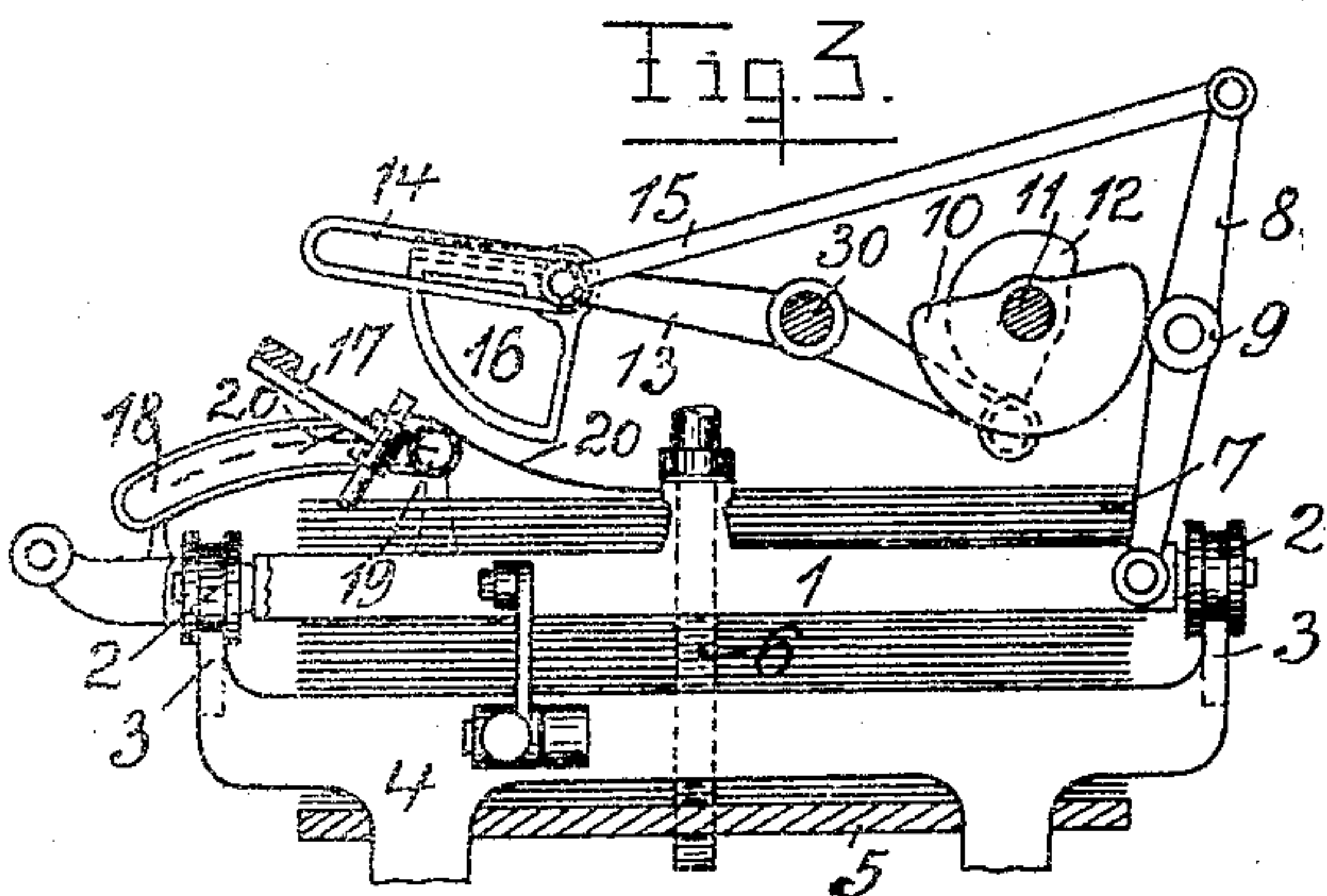
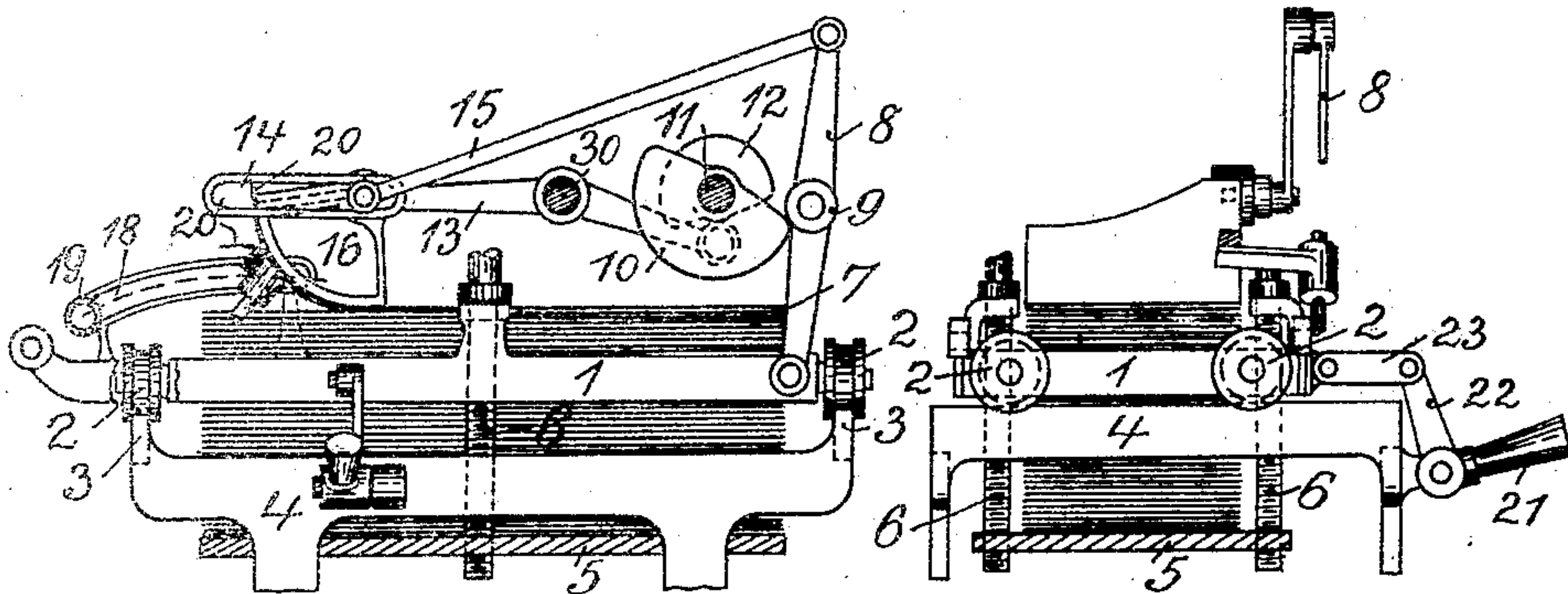


Fig. 6.

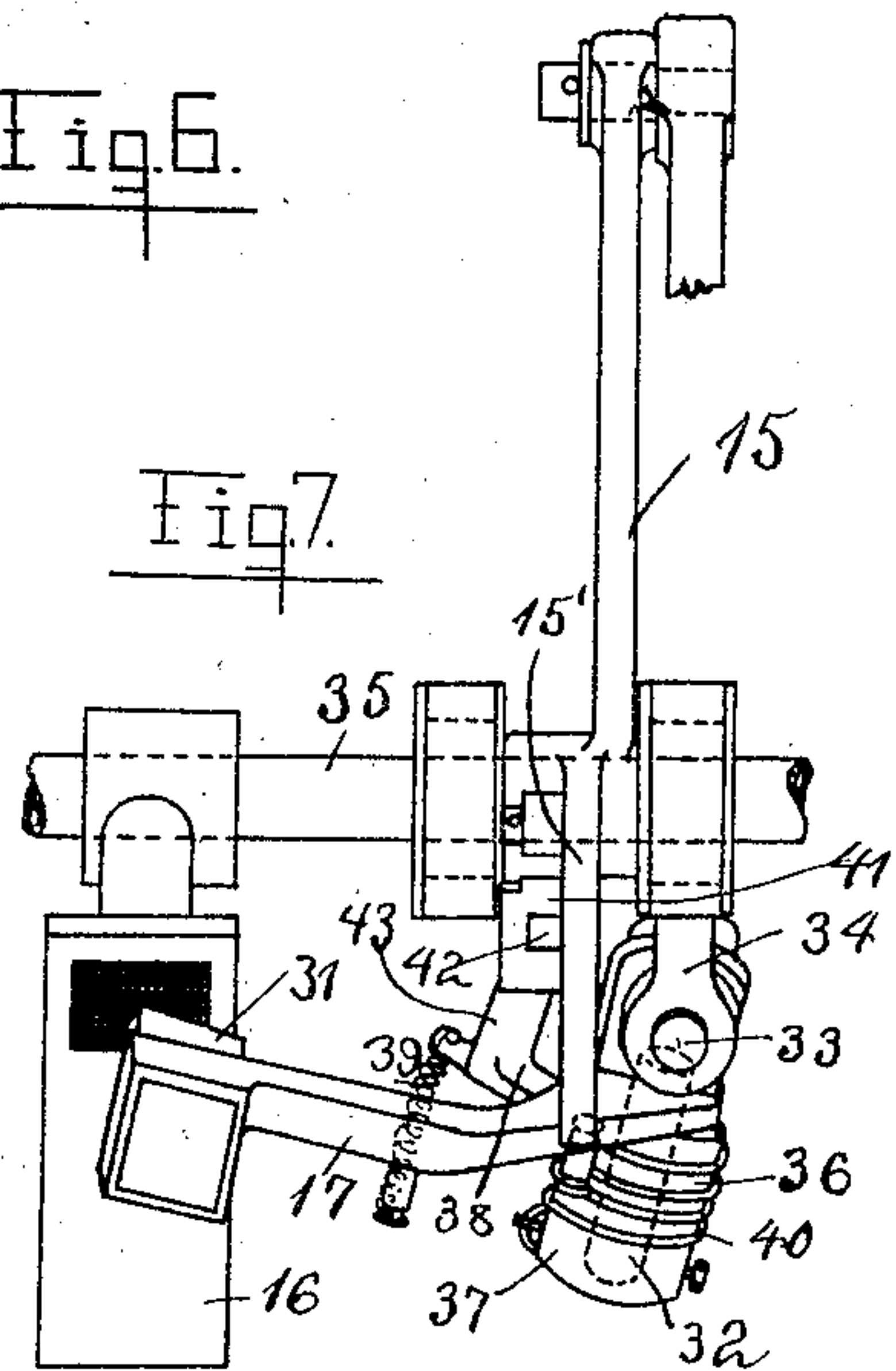


Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

OTTO SCHNEIDER, OF REICHENBACH, VOIGTLAND, GERMANY.

SHEET-SEPARATING DEVICE FOR PRINTING AND SIMILAR MACHINES.

No. 931,227.

Specification of Letters Patent.

Patented Aug. 10 1909.

Application filed November 19, 1907. Serial No. 402,899.

To all whom it may concern:

Be it known that I, OTTO SCHNEIDER, subject of the German Emperor, residing at Reichenbach, Voigtland, Germany, have invented new and useful Improvements in Sheet-Separating Devices for Printing and Similar Machines, of which the following is a specification.

The object of the invention is a device for separating the sheets of a pile of paper for the purpose of delivering the same separately into printing—or similar machines which the apparatus is connected to. In performing this work, the top sheet of the said pile is taken up at one corner by the action of a sector-shaped air-sucker and rolled up along its edge, a striking device being pressed at the same time against the underside of the sheet thus striking off other sheets sticking on the first one. After this the sheet is released by the sucker and seized by another air-sucker approaching the underside of the sheet and carrying it to a delivery-device.

There are some constructions of paper feeding devices in which the sheets of paper are lifted up by a sucking pipe of the length of all the breadth of the paper having a large number of holes. Apparatus of this kind have many disadvantages, which are avoided by my invention, in which the whole force of the sucking air is directed against one point, *i. e.*, the corner of the paper-sheet. Naturally it is easier to seize a sheet at one corner than at a long edge. The sucking mechanism being sector-shaped, the lifting of the paper takes place in an equal and slow manner. Sheets of paper sticking to the top sheet are removed by a striking device which together with the sucker are operated by the same mechanism.

In order that the invention may be clearly understood reference is made to the accompanying drawings in which an embodiment is represented by way of example, and in which:

Figure 1 is an elevation of the new paper-separator in connection with a sheet-delivery device; Figs. 2, 3, and 4 are side-elevations showing the parts of the device at different positions; Figs. 5 and 6 are front-elevations of Figs. 2 and 3 respectively. Figs. 7 and 8 are a front and a side elevation of the striking device in an enlarged scale.

All the separating mechanism is arranged on a frame 1 which, provided with pulleys 2

on each side, is displaceable laterally on rails 3 of a stationary frame 4. This latter frame is fixed to the printing or similar machine and carries a revoluble bell-crank lever 22 the one leg of which is supplied with a handle 21 and the other is supplied with a link 23 connected to the movable frame 1. The pile of paper 7 is lying on a table 5 which is connected by a pair of screw-spindles 6 to the movable frame 1. To one end of this frame a lever 8 is hinged lying with a roll 9 against a cam-wheel 10 attached to a rotating shaft 11. A second cam-wheel 12 connected to this rotating shaft is working against one end of a lever 13 that is revolubly placed on an axis 30 fixed to the frame 1. In the other end of this lever a slot 14 is provided, in which a link 15 is with one end movable connecting a sector-shaped air-sucker 16 to the other end of the lever 8.

At the outer side of the sucker 16 a striking mechanism 17 is revolubly mounted. As shown in Figs. 7 and 8, a striker 17, which is provided with india rubber 31 at one side, can turn on a pivot 32. This pivot is connected to a journal 33, which revolves on a forked bearing 34 attached to the slotted lever 13. On the pivot 32 a turnable sleeve 36 having a projection 38 is mounted and held by a collar 37 in its position. Between the projection 38 and the striker 17 a spring 39 is attached tending to bring together both these parts, until they touch each other by stops. One end of a second spring 40 lying around the sleeve 36 is connected to the collar 37, the other, to the striker 17. The spring tends to move the striker 17 away from the sucker. The link 15 has a lengthening piece 15', to which a ratchet 41 is hinged. This ratchet is made to lie against a stop 42 attached to the piece 15' and with its end to touch a projecting lug 43 at the projection 38 of the sleeve 36. At that side of the movable frame 1 which is shown in Figs. 3 and 4 on the left, a slide 18 is provided in which a sucking pipe 19 can be moved against the under side of the sheet 20 of the pile of paper 7. The pipe is connected as well as the sucker 16 by means of a hose or movable pipes to pneumatic means not shown on the drawings.

The operation of this device is as follows: The air-sucker 16 dropping down by the movement of the two cam-wheels 10, 12 and the levers 8, 13 on one corner of the top sheet of the pile of paper begins to suck that sheet

as shown in Figs. 2 and 3. The further rotation of the cam-wheels 10, 12 makes the sucker 16 roll with the sucked sheet along the edge of the pile and the sucked sheet is in this manner lifted up. When the sucker has during its movement been rolled up half way, the ratchet 41 seizes the projecting lug 43 and by aid of the spring 39 turns the end of the striker 17 with its india rubber face against the sheet of paper which is lifted up by the sucker the circumferential velocity of the sucker-end being greater than the velocity of the bearing of the sucker in the slot 14. Since from this moment the ratchet 41 moves more quickly than the projecting lug 43 rotates, the spring 39 is extended and presses the striker harder against the sucked sheet of paper. As this sheet moves upward during the rolling movement of the sucker the striker makes a frictional movement and by this friction removes any sheet 20' sticking on the top sucked sheet 20 (as shown in Fig. 3). The parts continuing their movements the end of the lengthening piece 15' (see Fig. 7) presses down the striker 17 and turns it around its bearing parts 33, 34, thus moving its frictional end downward. The sucker 16 having nearly arrived at the end of the slot 14, the striker has been pressed so far back that the upper end of the projecting lug 43 reaches the lower end of the ratchet 41, whereupon the striker recoils into its normal position by the action of the spring 40. Now the link 13 with all the striking mechanism is lifted up by the action of the cam 12 and the sucker pipe 19, which remained away from the pile till now, as Figs. 1-3 show, does enter, following the slide 18, under that separated sheet 20; by admission of air into the sucker 16 the sheet drops down and is lying on the sucker pipe 19 now, Fig. 4. To loosen the sheet over its whole surface, air is blown under it in any known manner. The pipe 19 which sucks that separated sheet now carries the same to a device grasping the front edge of the sheet between rollers 22' 27 that deliver the sheet to its certain place near the cylinder of the printing or similar machine. This delivering device is not part of the invention; it consists of a frame 21 hinged to the ends of the movable frame 1 that can move laterally with the same. Rolls 22' are revolvably mounted in that frame 21 and can be rotated by toothed wheels 24, 25 which a swinging rack-bar 26 is acting upon. Other rolls 27 are attached to the one leg of bell-crank levers 28 mounted to turn on axes 29, which are connected by special bearings to the frame 21. On the other leg of the bell-crank levers rolls 27' are provided, against which a cam 28' is working. This cam 28' and the rack-bar 26 are moved by mechanisms that are driven by the shaft 11 and which are not shown on the drawings. On one pair of the rolls 27

and 22', which have a metallic surface, electric contacts 29' connected to a source of current are sliding. If by chance no sheet of paper is delivered between the rolls 27 and 22', these rolls touch each other and close the electric circuit, whereby the printing machine can be stopped or a signal given.

During the operation of the apparatus the table 5 with the pile of paper is screwed upward corresponding to the removal of the sheets and kept at the right height automatically in any known manner.

To make the drawings better understood all the driving mechanisms for the screw-spindles 6, the cam-wheels 10, 12, the sucker pipe 19, the rack-bar 26, and the levers 28 are, unessential for the scope of the invention, not shown in the drawings.

What I do claim and desire to secure by Letters Patent is:

1. In devices of the type described the combination of a frame, a table for a pile of paper, an air-sucker, means for dropping down said sucker on a corner of said pile and for giving it a rolling movement along the edge of said pile, and a striking mechanism periodically entering against the under side of the lifted sheet of paper.

2. In devices of the type described the combination of a frame, a table for a pile of paper, an air-sucker consisting of a sector-shaped part with an air-sucking channel at one end, means for dropping down said sucker on a corner of said pile and for giving it a rolling movement along the edge of said pile, and a striking mechanism periodically entering against the under side of the lifted sheet of paper.

3. In devices of the type described the combination of a frame, a table for a pile of paper, an air-sucker, means for dropping down said sucker on a corner of said pile and for giving it a rolling movement along the edge of said pile, and a striking mechanism periodically entering against the under side of the lifted up sheet of paper, and means for drawing away the sheet after removal of the striker for delivering it into the printing- or similar machine.

4. In devices of the type described the combination of a frame, a table for a pile of paper, an air-sucker, means for dropping down said sucker on a corner of said pile and for giving it a rolling movement along the edge of said pile, and a striking mechanism periodically entering against the under side of the lifted sheet of paper, and a sucking pipe periodically entering against the under side of the lifted sheet of paper after removal of the striker.

5. In devices of the type described the combination of a frame, a table for a pile of paper, a lever hinged to the frame, a cam-wheel acting upon said lever, a second lever adapted to oscillate on the frame and hav-

ing a slot, another cam-wheel working against said second lever, an air-sucker, a link connecting the end of said first lever to said air-sucker which is movable in said slot of the second lever, and a striking mechanism.

6. In devices of the type described the combination of a frame, a table for a pile of paper, screw-spindles connecting said table to said frame, an air-sucker, means for dropping down said sucker on a corner of said pile and for giving it a rolling movement along the edge of said pile, and a striking mechanism periodically entering against the under side of the lifted sheet of paper.

7. In devices of the type described the combination of a frame, a table connected to

said frame, rolls attached to said frame another frame bearing on rails said rolls, means for moving said frame laterally on said rails, an air-sucker, means for dropping down said sucker on a corner of said pile and for giving it a rolling movement along the edge of said pile, and a striking mechanism periodically entering against the under side of the lifted sheet of paper.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OTTO SCHNEIDER.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.