

No. 664,585.

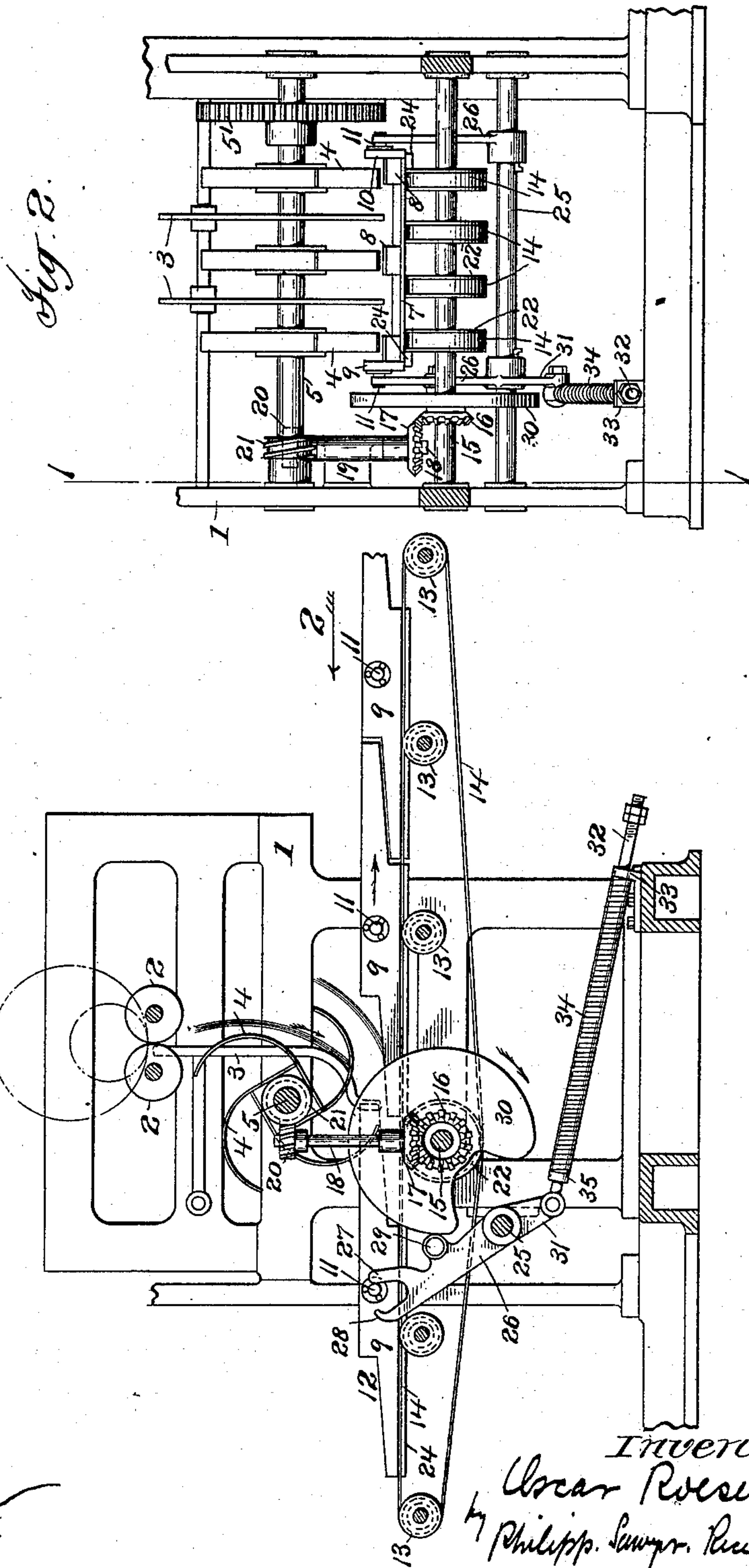
Patented Dec. 25, 1900.

O. ROESEN.
DELIVERY MECHANISM.

(Application filed May 22, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Attest:
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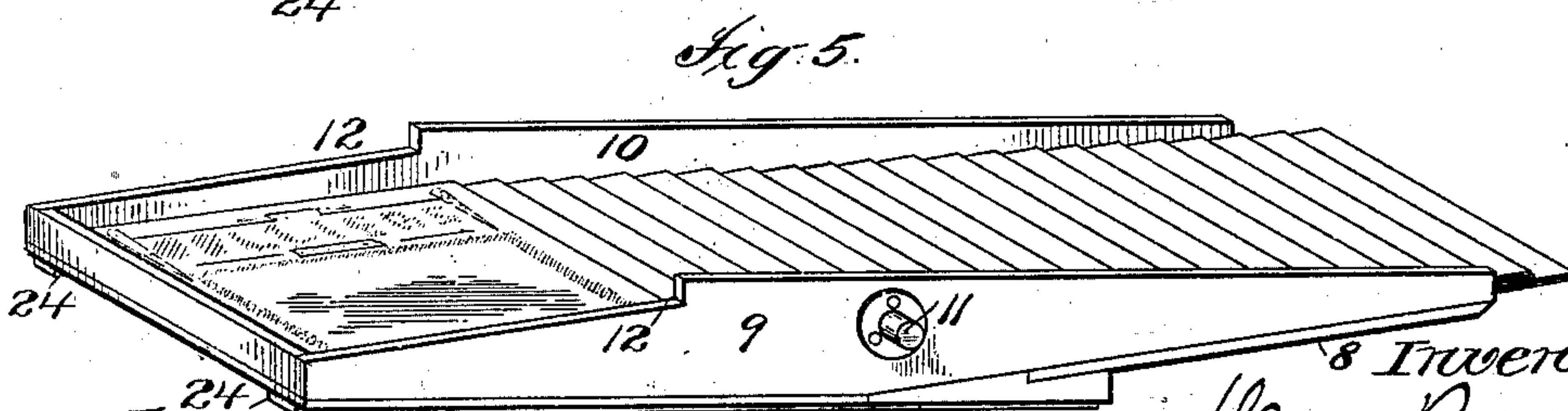
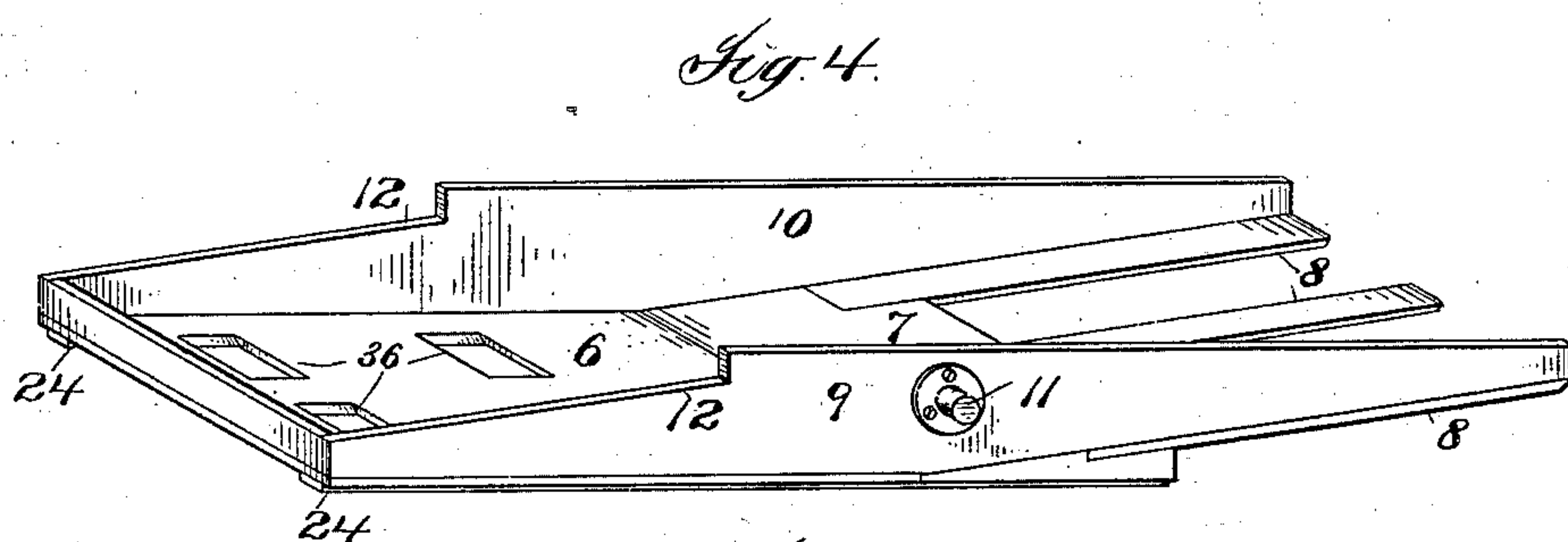
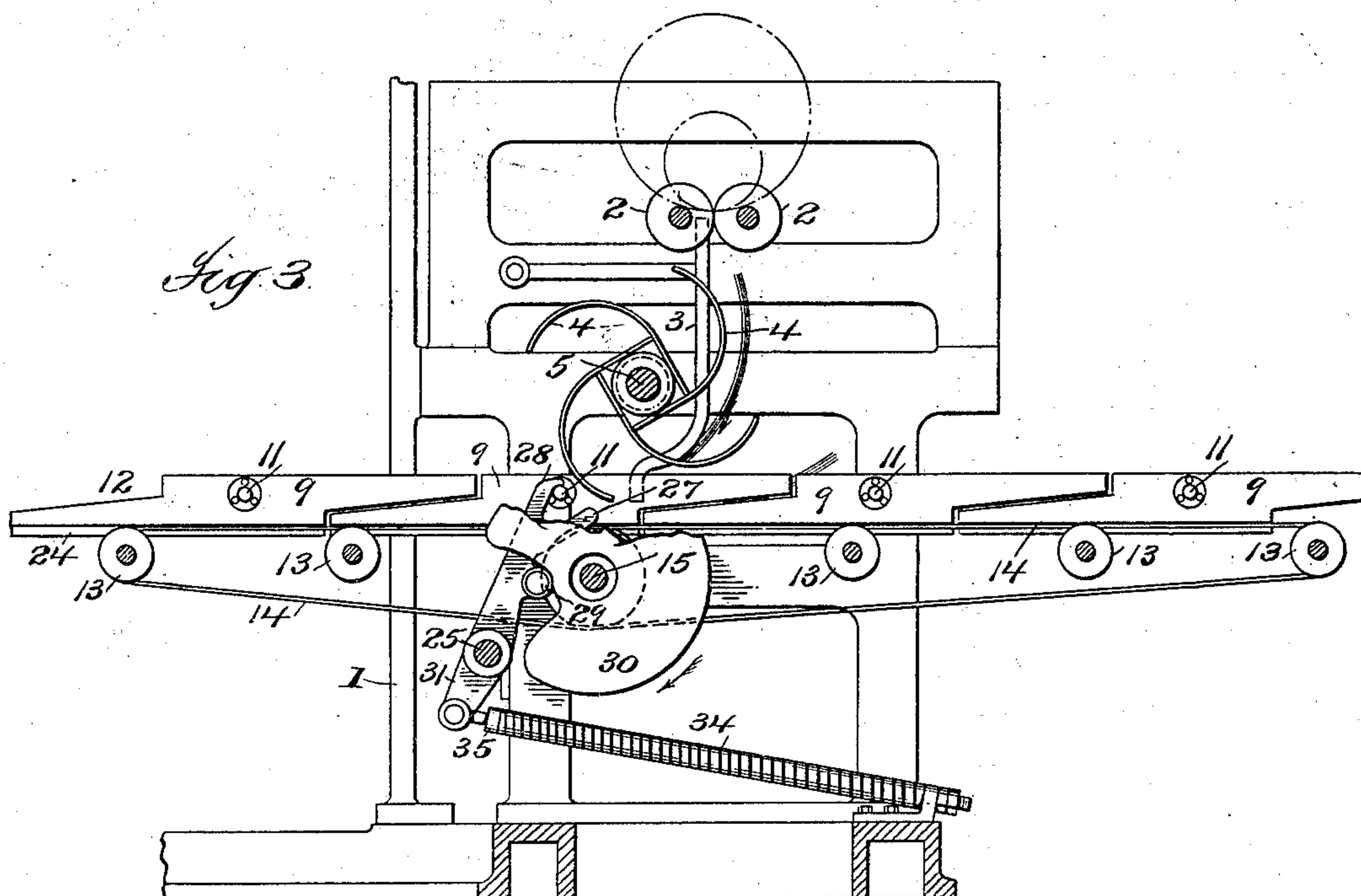
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2 Sheets—Sheet 2.



Attest:
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UNITED STATES PATENT OFFICE.

OSCAR ROESEN, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, OF
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DELIVERY MECHANISM.

SPECIFICATION forming part of Letters Patent No. 664,585, dated December 25, 1900.

Application filed May 22, 1900. Serial No. 17,573. (No model.)

To all whom it may concern:

Be it known that I, OSCAR ROESEN, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Delivery Mechanisms, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in delivery mechanism, the invention being primarily intended for use with printing-machines, although it may be used in other relations.

In fast printing-machines as now ordinarily constructed the printed papers are either delivered onto a series of belts which are continuously moving, so that the papers overlap as they fall thereon, or else the papers are packed, by means of a moving plunger, in what is generally known as a "packer-box." On high-grade work, however—such, for instance, as the printing of illustrated papers—both these systems of delivery are objectionable because the papers are liable to become smutted or rubbed. The packer-box system is impracticable for such work, and the constantly-moving-belt system, while a great improvement on the packer-box system, is objectionable for high-grade work because as the papers are removed in bunches some of them are apt to be rubbed together and the ink will smudge. Furthermore, in removing the bunches of papers from the belts the operator seizes them by the edges, and if the operator's hands are dirty finger-marks will be left on the paper, and also if the papers shift or slip while in the hands of the operator some of them will be smutted. Furthermore, after the papers are removed from the delivery-tapes they must be allowed to dry. This is now usually effected by superposing the removed bunches upon each other, the bunches being piled on a table or other suitable support. The result of this is that the papers become packed more or less closely together, which is liable to produce offsetting, and, besides, sufficient chance is not given for the air to circulate between the papers, so that the drying operation is necessarily a slow one.

It is one of the objects of this invention to

produce a delivery mechanism in which the papers can be removed from the machine without being handled by the operator.

A further object of the invention is to produce a delivery mechanism in which the papers are delivered in such a manner that the several bunches may be stacked with the papers of each bunch out of contact with the papers of the other bunches and sufficient space being left between them, so that the papers are not pressed together by their own weight, and the air is given an opportunity to circulate freely between the bunches and the papers of each bunch.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements, and combinations, as will be hereinafter fully described, and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings, which form a part of this specification, and in which like characters of reference indicate the same parts, Figure 1 is a front elevation, partly in section, of so much of the delivery end of a printing-machine as is necessary to an understanding of the invention, the plane of section being indicated by the line 1 1 of Fig. 2. Fig. 2 is a side view of the construction shown in Fig. 1, the view being taken in the direction of the arrow 2 of Fig. 1. Fig. 3 is a view similar to that shown in Fig. 1, but with the parts in a different position. Figs. 4 and 5 are detail views of the sheet-receiving tray employed.

Referring to the drawings, which illustrate one embodiment of the invention, 1 indicates a frame which in the present instance is a portion of the frame of a folding apparatus of a rotary printing-machine. The sheets as they come from the folding apparatus pass through rollers 2, suitably journaled in the frame, and in the construction shown are directed by suitable guides 3 into an S-fly 4, said fly being mounted on a shaft 5, which is driven, as by a gear 5', from any suitable moving part of the machine. The construction so far described is an ordinary construction of delivery mechanism, and any other similar well-known construction may be substituted therefor, if desired.

The mechanism embodying the invention involves the use of a plurality of sheet-receivers. While these sheet-receivers may be varied widely in form, they will preferably consist of trays. In the construction shown each of these trays has a sheet-supporting bottom or surface consisting of a rear portion 6 and a forward portion, which in the present instance is made up of a supporting-block 7 and spaced fingers 8, set in mortises in the block. The bottom or sheet-supporting surface of the tray is connected to sides 9 and 10. Each of these sides 9 and 10 has a projection 11, the purpose of which will be hereinafter stated, and each side has a portion of its top cut away, the top 12 of the cut-away portion being lower than the top of the main portion of the side. These trays are designed to be so presented to the mechanism for delivering the folded sheets that each tray will receive from the delivery mechanism a pack of overlapped folded sheets. The construction by which the pack of overlapped folded sheets is deposited in each tray may be varied within wide limits. In the construction shown this is effected by advancing each tray during the delivering operation beneath the delivery mechanism.

Any suitable form of advancing mechanism may be used to forward the trays. In the construction shown the advancing mechanism consists of a series of rollers 13, around which pass a series of belts or tapes 14. These tapes and rollers are designed to be continuously driven, and this continuous driving may be effected in any desired way. In the construction shown the shaft 15, mounted in suitable bearings in the frame 1, is provided with a gear 16, which meshes with a gear 17, mounted on a shaft 18, supported in a suitable bearing 19, secured to the frame. The shaft 18 carries a worm-gear 20, which meshes with a worm 21 on the shaft 5. The shaft 15 is provided with a series of grooved pulleys 22, from which belts are run to the forward one of the rollers 13. The driving-roller 13 will operate to drive the belts or tapes and the remainder of the rollers in an obvious manner. It may be here remarked that the rollers 13 are somewhat wider than the trays which they support and are provided with grooves, which are engaged by guiding-strips 24, secured to the bottom of each of the trays. This construction insures the advance of the trays without any sidewise movement, but while it is desirable is not necessary. It may therefore either be omitted or replaced by any other suitable guiding means. As each tray is carried along by the advancing mechanism described it will be seen that the sheets which are delivered into the tray by the delivery mechanism will overlap each other, the position of the sheets being well shown in Fig. 5.

It has been heretofore stated that while the construction of the receivers may be varied within wide limits they preferably consist of

trays, each of which has the forward portion of its bottom or sheet-supporting surface arranged in a higher plane than that which contains the rear portion. The reason for this construction is to enable a tray which is to be filled to be brought into position beneath the sheet-delivery devices without disturbing the position of the tray which has just been filled with respect to the advancing mechanism, thus avoiding any sudden shock or jar which would tend to displace or move the sheets in the filled tray and cause them to rub together and become smutted. Trays constructed as described can be arranged so that the rear portion of one tray is overlapped by the forward portion of the next tray and the tray which is to be filled can be brought into position to receive its sheets immediately after the last sheet has been placed in the preceding tray and before it has been moved out of the way by the movement of the advancing mechanism. In the preferred construction, therefore, positioning devices will be used which operate to bring each succeeding tray into proper position immediately after a predetermined number of sheets has been placed in the preceding tray. The construction of this positioning device may be widely varied. In the construction shown a rock-shaft 25, mounted in suitable bearings in the frame, carries two arms 26, suitably secured to the shaft. Each of these arms 26 is provided with a detaining or holding finger 27 and a forwarding-finger 28, these fingers being arranged to cooperate with the projections 11, before described as secured to the sides of the trays. One of the arms 26 carries a cam roll or stud 29, which cooperates with a cam 30, which is mounted on the shaft 15. Said arm 26 is also provided with an extension 31, to which is secured a spring-rod 32, which passes through a loop 33, secured to the frame, and is surrounded by a spring 34, which bears against a collar 35, secured to the rod. For the major portion of the revolution of the cam 30, therefore, the arms 26 are held back and the detaining-fingers 27 operate against the projections 11, thus preventing any movement of the sheet-receiver, notwithstanding the fact that the advancing mechanism is continuously operating. The gearing by which the shaft 15 is operated is so proportioned that the cam 30 makes one revolution for a predetermined number of revolutions of the fly-shaft. When, therefore, a predetermined number of sheets has been deposited in the preceding tray, the depressed portion of the cam comes opposite the cam-roll 29 and allows the spring 34 to rock the shaft 25 and throw the arms forward. At this time the forwarding-fingers 28 strike the projections 11 and cause a quick movement of the tray, this movement being of sufficient extent to advance the tray from the position shown in Fig. 1 to the position shown in Fig. 2—that is to say, with its forward end overlapping the rear end of the preceding tray.

As fast as the trays are filled they are removed from the advancing mechanism and piled up one on top of the other. The fact that the bottoms of the trays are in part composed of spaced fingers permits free access of air to the tray, and openings 36 may also be provided in the bottom of the tray to facilitate the ingress of air. With the construction as described, therefore, it is unnecessary to handle the printed sheets between the time of delivery and the time when they are sufficiently dry so that they can be handled without danger of smutting.

While the invention is primarily intended for use in connection with printing-machines, it may be used in other relations. While, furthermore, the construction set forth is a preferred embodiment of the invention, it will be understood that the invention may be embodied in constructions which are widely different from the one described. The invention is not therefore to be limited to the specific use described nor to the specific details of construction.

What is claimed is—

1. The combination with a sheet-delivery apparatus, of a plurality of independent sheet-receivers, and means whereby each receiver is presented to the sheet-delivery apparatus and is caused when so presented to receive a pack of sheets, substantially as described.

2. The combination with a sheet-delivery apparatus, of a plurality of independent sheet-receivers, and means whereby each receiver is to receive a pack of sheets which partly overlies each other, substantially as described.

3. In a sheet-delivery apparatus, the combination with sheet-delivery means, of a plurality of sheet-receivers in which the sheets are superposed by the delivery means, means for presenting each receiver to the delivery apparatus, and means for advancing each receiver during the time the sheets are delivered thereto, substantially as described.

4. In a sheet-delivery apparatus, the combination with sheet-delivering means, of a plurality of sheet-receivers, and means whereby the sheet-delivering means is caused to deposit a pack of sheets in each receiver, such sheets partly overlying each other, substantially as described.

5. In a sheet-delivery apparatus, the combination with sheet-delivering means, of a plurality of sheet-receiving trays, each tray being constructed so that a part of its sheet-supporting surface may be caused to overlie a part of the sheet-supporting surface of the next tray, substantially as described.

6. A tray for use in sheet-delivery apparatus having parts of its sheet-supporting surface arranged in different planes, whereby two such trays are adapted to be so arranged that a part of the sheet-supporting surface of one tray overlies a part of the sheet-support-

ing surface of the other tray, substantially as described.

7. A tray for use in sheet-delivery apparatus having parts of its sheet-supporting surface arranged in different planes and parts of the tops and parts of the bottoms of its sides similarly arranged, whereby each tray may be caused to overlap a similar tray at one end and to be overlapped by a similar tray at the other end, substantially as described.

8. A tray for use in sheet-delivery apparatus constructed to receive a pack of overlapping sheets and having the forward portion of its sheet-supporting surface arranged above the rear portion, whereby two such trays are adapted to be so arranged that the forward portion of the sheet-supporting surface of one overlies the rear portion of the sheet-supporting portion of the other, substantially as described.

9. A tray for use in sheet-delivery apparatus having its sides and bottoms at each end of the tray arranged at different heights, whereby two such trays are adapted to be so arranged that the part of the bottom of one tray overlies the part of the bottom of the next tray, substantially as described.

10. The combination with a sheet-delivery device, of a plurality of sheet-receivers, means for advancing a sheet-receiver with respect to the delivery device during the delivering operation so that a pack of overlapping sheets will be deposited in the receiver, and means for positioning a second receiver so that the first sheet deposited in it will overlie the last sheet deposited in the first receiver but will have its major portion supported by the second receiver, substantially as described.

11. The combination with a sheet-delivery device, of a plurality of sheet-receivers, means for advancing one or more of said receivers at a constant speed, means for preventing the advance of a succeeding receiver until the preceding receiver is filled, and means for positioning said succeeding receiver so that it will receive its first sheet without interfering with the advance of the preceding receiver, substantially as described.

12. The combination with a sheet-delivery device, of a plurality of sheet-receiving trays, each tray having the forward portion of its sheet-supporting surface arranged above its rear portion, means for advancing each tray during the delivery operation, whereby a pack of overlapping sheets will be deposited therein, and means for bringing a succeeding tray into position as the preceding tray is filled with the higher portion of the sheet-supporting surface of the succeeding tray overlying the lower portion of the sheet-supporting surface of the preceding tray, substantially as described.

13. The combination with a sheet-delivery device, of a constantly-running advancing mechanism, a plurality of trays arranged thereon, each tray having parts of its sheet-

supporting surface arranged at different heights, and means for bringing each succeeding tray, as the preceding tray is filled, into a position where the higher portion of its sheet-supporting surface overlies the lower portion of the sheet-supporting surface of the preceding tray, substantially as described.

14. The combination with a sheet-delivery device, of a supporting and advancing mechanism, a plurality of sheet-receiving trays carried thereby, and a tray-positioning device, substantially as described.

15. The combination with a sheet-delivery device, of a supporting and advancing mechanism, a plurality of sheet-receivers carried thereby, and a tray-positioning device, substantially as described.

16. The combination with a sheet-delivery device, of an advancing mechanism including belts and rollers, a plurality of trays carried thereby, each tray having parts of its sheet-supporting surface arranged at different heights, a tray-positioning arm, and means for intermittently operating the arm, substantially as described.

17. The combination with a sheet-delivery device, of a tray-advancing mechanism, a plurality of trays, each tray having parts of its

sheet-supporting surface arranged at different heights, a tray-positioning device, means whereby said device prevents the advance of each succeeding tray until the preceding tray is filled, and means whereby said positioning device brings each tray into position with the higher portion of its sheet-supporting surface overlying the lower portion of the sheet-supporting surface of the preceding tray after a predetermined number of sheets have been deposited in said preceding tray, substantially as described.

18. The combination with a sheet-delivery device, of an advancing mechanism, a plurality of trays, each tray having parts of its sheet-supporting surface arranged at different heights and having a projection, an arm having retaining and advancing fingers which engage the projection, and means for intermittently operating the arm, substantially as described.

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

OSCAR ROESEN.

Witnesses:

OTTO L. RAABE,
HENRY S. MOUNT.