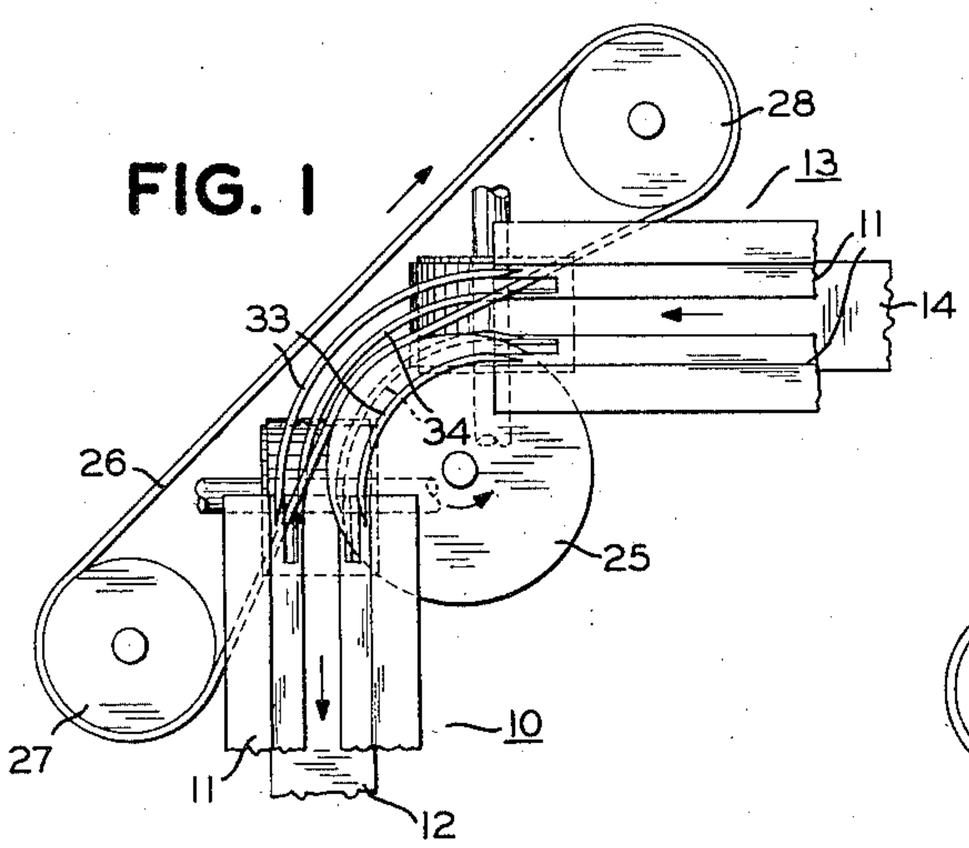
Oct. 1, 1935. F. GRIFFITH 2,016,268

CONVEYER TRANSFER

Filed Jan. 23, 1932

FIG. 1



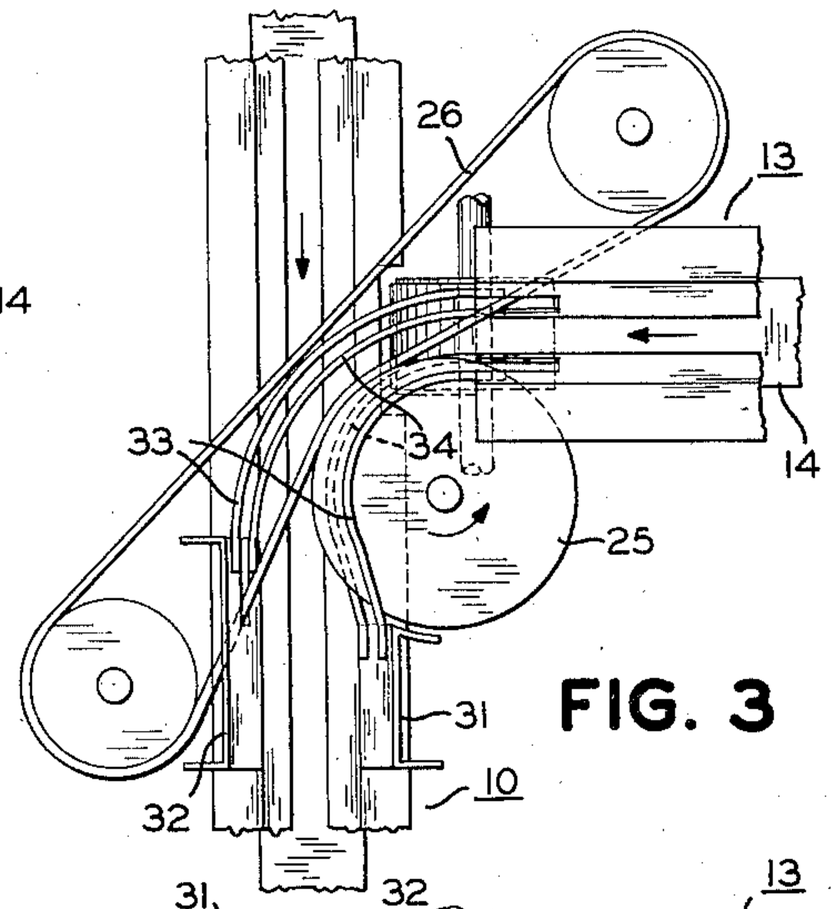


FIG. 3

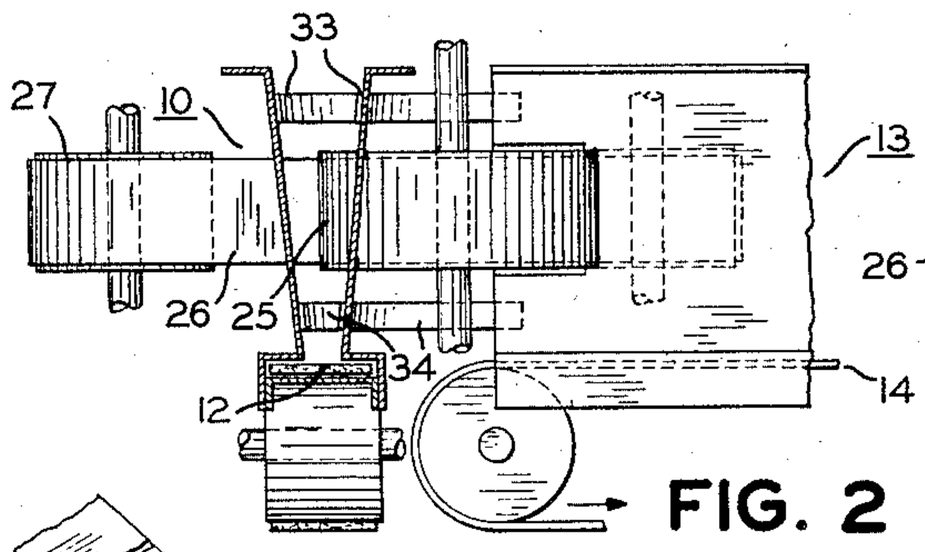


FIG. 2

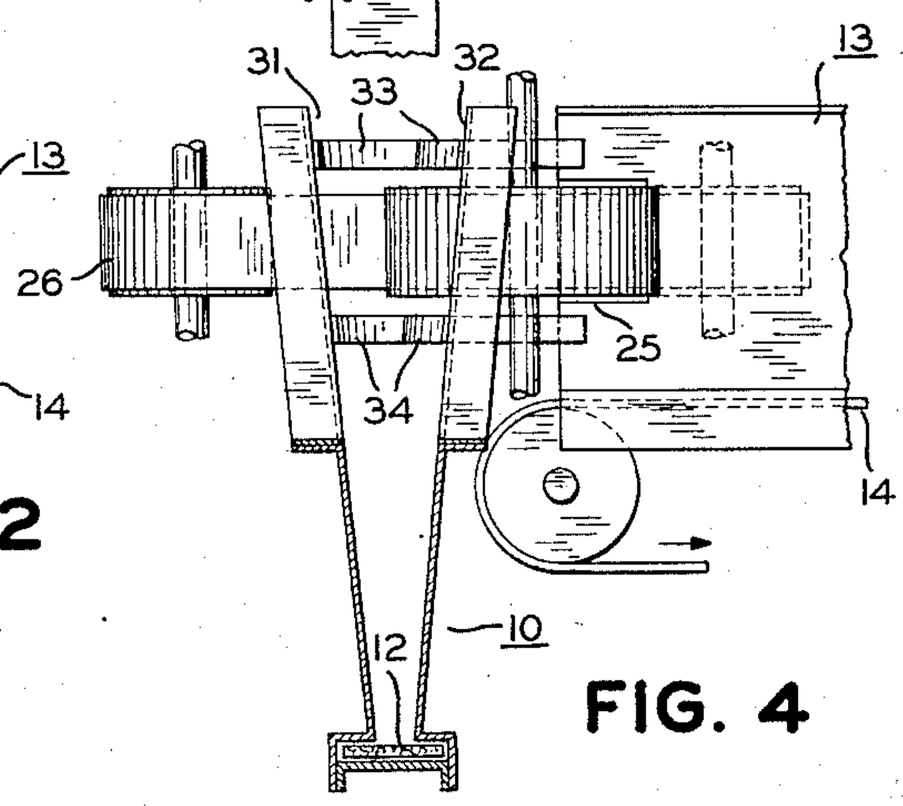


FIG. 4

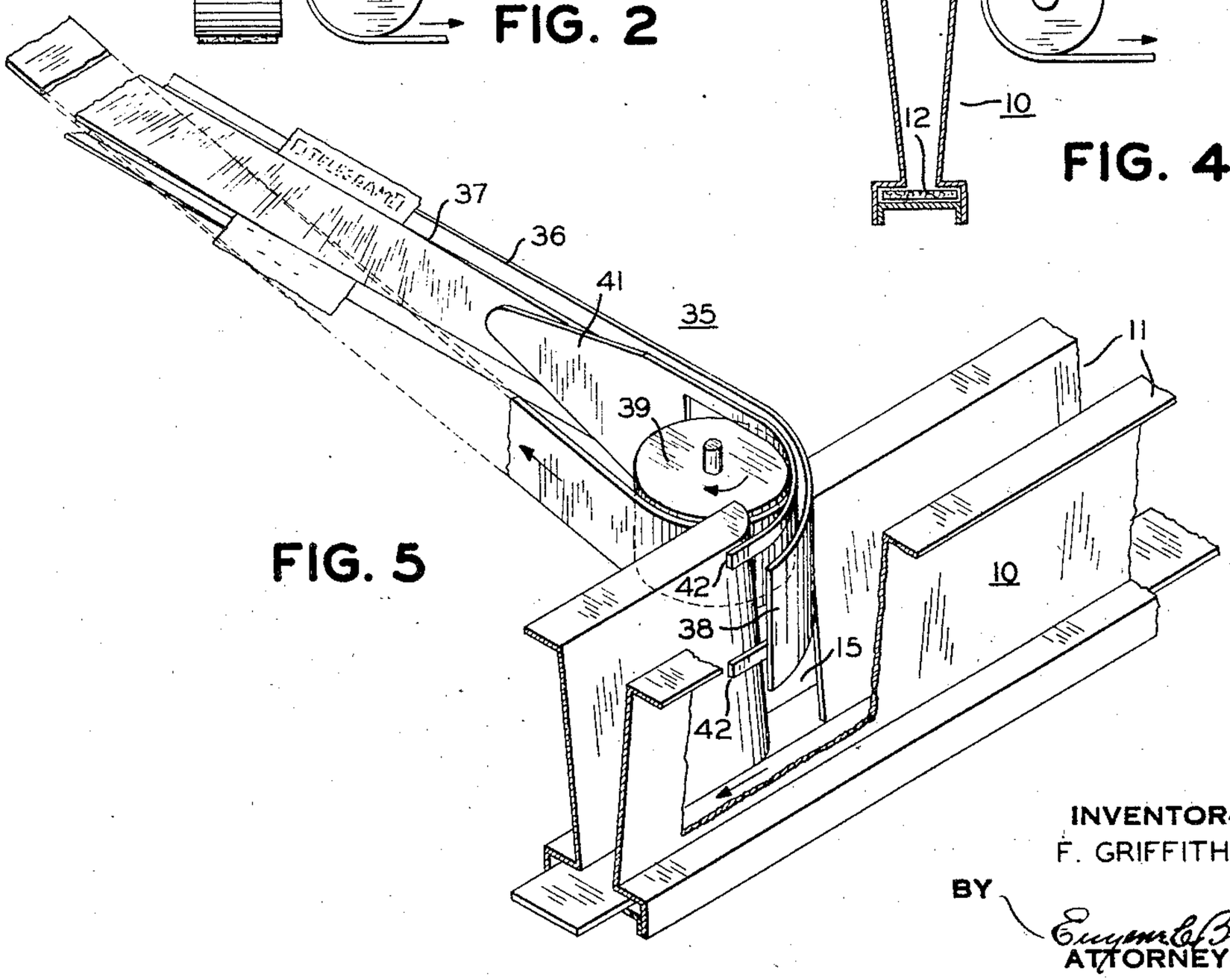


FIG. 5

INVENTOR-
F. GRIFFITH

BY Eugene E. Brown
ATTORNEY-

Patented Oct. 1, 1935 2,016,268

UNITED STATES PATENT OFFICE

2,016,268

CONVEYER TRANSFER

Francis Griffith, Passaic, N. J., assignor to The Western Union Telegraph Company, New York, N. Y., a corporation of New York

Application January 23, 1932, Serial No. 588,410

11 Claims. (Cl. 198—160)

This invention relates to conveyers for sheet material, such as telegram blanks and the like, more particularly to conveyers arranged to receive and transport sheet material in an upright or substantially vertical position and in a horizontal direction; and has for an object to provide means for transferring or delivering material thereto from other conveyers arranged to deliver sheet material in an upright position.

A more particular object of this invention is to provide translating means cooperating with a delivery conveyer for carrying the material therefrom into a receiving conveyer and at the same time directing it into the line of travel of the receiving conveyer.

Another object of this invention is to provide a transfer connection between a first conveyer arranged to deliver sheet material in an upright position and a second conveyer arranged to receive the material and carry it forward in a similar position and translating means arranged to maintain substantially continuous engagement with the sheets of material as they pass through the transfer section.

A still further object of this invention is to provide transfer means between connecting conveyers without the use of chutes or other conveyer sections in which movement of material therethrough is accomplished largely by gravity.

These and other objects of my invention will be apparent from the following description taken in connection with the accompanying drawing.

According to this invention the receiving conveyer in its preferred form may be a conveyer of the V-trough type comprising spaced members forming a conveyer channel or guideway arranged to convey sheet material in an upright position along a horizontal direction and a conveyer belt traveling along the bottom of said channel for conveying sheet material therealong. However, other forms of receiving conveyers may be employed and the applications of the invention will be substantially the same when employed in connection with any type of horizontally disposed conveyer arranged to carry sheet material in an upright position.

Heretofore, when sheet material has been discharged or deposited into a conveyer of the type in which sheet material is transported in an upright position and in a horizontal direction, it has been necessary to arrange the conveyer terminal so that the material will be discharged therefrom over the side walls of the receiving conveyer. For example, refer to Patent No. 1,801,906 granted April 21, 1931 to F. E. d'Humy et al. As a consequence, the delivery conveyer must be disposed above or at a higher elevation than the receiving conveyer, necessitating in most instances the use of gravity chutes for conducting the material from the terminus of the delivery conveyer over the side walls and into the receiving conveyer. Moreover, in this connection it is to be observed that when the sheet material passes from one conveyer to another that it also changes its direction of travel. The chutes are usually so formed that a part if not all of the change of direction is accomplished by the chutes as the sheets travel through them. In arrangements where gravity chutes must be employed, trouble has been experienced with the telegram or message blanks adhering to the side walls of the chute due to static accumulations on the sheets or due to the sheet becoming folded or wrinkled in such a manner that they will not freely pass through the chute. According to this invention an arrangement is provided for the elimination of these gravity chutes or for eliminating at least chutes of the type which depend upon the speed or momentum of the traveling sheets and the action of gravity to carry the sheets through them. This is accomplished by providing translating means between the delivery and receiving conveyer which embodies one or more guide members and a cooperating motivating member which propels the sheets along the guide members until they have substantially assumed their new line of travel in the receiving conveyer.

The delivery conveyer is arranged according to this invention to deliver the traveling sheets in an upright position. When the sheets are to be delivered into an intermediate portion of the receiving conveyer an inlet opening is provided in the members forming the conveyer channel or guideway and the terminus of the delivery conveyer is joined to the receiving conveyer at the opening so that the sheets are delivered directly into the line of travel of the receiving conveyer, the belt of the delivery conveyer or an extra element comprising the motivating member and guide means at the juncture of the two conveyers being employed for changing the direction of the material as it passes from the delivery into the receiving conveyer.

In another form where the material is delivered from the delivery into the receiving conveyer at the outer end of the receiving conveyer, the two conveyers may be joined by providing suitable translating means for engaging or gripping the sheets as they leave the first conveyer and pass into the second. In another form, the

translating means may be employed to co-operate with the discharge of the delivery conveyer and bring the sheets of material into the line of travel of the receiving conveyer and then drop the sheets from the translating means directly into the receiving conveyer between the side members of the channel or guideway.

For a further description of this invention reference may be had to the drawing forming a part of this application, in which:

Fig. 1 is a plan view showing the delivery conveyer feeding into the end of the receiving conveyer and provided with transfer means comprising a roller and an idler belt traveling in engagement therewith;

Fig. 2 is a view in elevation of the arrangement illustrated in Fig. 1 showing a side of the delivery conveyer and a cross section of the receiving conveyer;

Fig. 3 is an arrangement using substantially the same type of transfer means as in the foregoing but with the delivery conveyer disposed at a higher elevation than the receiving conveyer;

Fig. 4 is a view in elevation showing the arrangement shown in Fig. 3 from the side of the delivery conveyer with a cross section of the receiving conveyer; and

Fig. 5 is a perspective view of an arrangement showing a drag type conveyer arranged to deliver material through an opening in the side of the receiving conveyer.

Referring to Figs. 1 and 2, a section of the two V-trough conveyers is shown, one a receiving and the other a delivery conveyer. The receiving conveyer **10** comprises V-trough forming members **11** arranged to support a traveling belt **12** at the bottom thereof. The lower edges of the trough forming members **11** overhang the edges of the traveling belt so that sheets of material being conveyed, such as telegram blanks or the like, will be prevented from slipping down between the edges of the belt and the bottom of the conveyer trough. The delivery conveyer **13** comprises similar trough forming members **11** and a moving belt **14**.

The two conveyers are shown as being disposed at right angles to each other. However, any other suitable angle may be employed. The channel forming members are not joined to each other but are spaced apart. The material leaving the delivery conveyer is carried into the receiving conveyer by translating means disposed at the apex of the angle formed between the two conveyer channels. The translating means comprises a motivating member in the form of a roller or cylinder **25** disposed with its periphery substantially in alignment with the center lines of both conveyer channels. A guide member in the form of an idler belt **26** is disposed to travel around two idler rollers **27** and **28** and so arranged as to bring the belt **26** in co-operative engagement with the roller **25**.

It will be observed by referring to Fig. 2 that the two conveyers are disposed substantially at the same level and that sheets of material are engaged by the translating belt and roller arrangement before they pass entirely beyond the supporting belt **12** in the delivery conveyer. In this manner, the material is not permitted to drop down but is carried into the entrance of the receiving conveyer at the same level at which it was traveling in the delivery conveyer. It will be observed that here the guide member or belt **26** also serves as a motivator.

The roller **25** and belt **26** travel in such a direction that the sheets of material passing from the delivery conveyer are engaged between the belt and roller and carried around the peripheral portion of the roller in contact with the belt and is delivered directly into the outer end of the channel of the receiving conveyer. In other words, the roller and belt combination provide translating means which co-operates with the delivery conveyer to carry the material from the delivery conveyer to the receiving and at the same time acts to change the direction of travel of the material and deliver the same into the receiving conveyer through the substantially continuous propulsion of the sheets by the motivating member of the translating means. With such an arrangement chutes are unnecessary and the material is propelled substantially throughout the length of the conveyer system from one conveyer to the other along a line of travel by positively operated translating or conveying means in contact with which the material is maintained.

Referring to Figs. 3 and 4 another embodiment of this invention is illustrated employing a similar type of translating means between the two conveyers. This arrangement comprises a delivery conveyer **10** and a receiving conveyer **13** both being similar to that shown in Fig. 1. However, in this arrangement the material is transferred from the delivery to an intermediate portion of the receiving conveyer instead of being fed in at the outer end of the receiving conveyer. This arrangement differs from that illustrated in Figs. 1 and 2 in that the sheets of material are deposited through the extended sides **31** and **32** of the receiving conveyer. The delivery conveyer is disposed at a higher level than the receiving conveyer. The elevation is sufficient to permit the translating means comprising roller **25** and belt **26** to extend out over the conveyer channel of the receiving conveyer **13** at a sufficient height to permit sheets traveling along the receiving conveyer to pass uninterruptedly underneath the translating means. Although the translating means is shown as disposed horizontally in this embodiment, it may be inclined downwardly for discharging the sheets at a lower point, thereby reducing the drop in reaching normal travel position in the receiving conveyer.

In both of the arrangements illustrated in Figs. 1 to 4 guide means, extending substantially parallel to the translating means, may be provided for connecting the two conveyer channels. The guide means may comprise an upper pair of strips **33**, spaced substantially the same distance apart as the upper edges of the side walls **11** of the delivery and receiving conveyers respectively and a lower pair of strips **34**, spaced substantially the same distance apart as the lower edges of said walls. The translating roller and belt arrangement is then disposed to carry the sheets substantially centrally of the guideway provided between said spaced strips. In this manner, the upper and lower edges of the sheets are prevented from getting out of alignment in entering the translating means between the two conveyers and the channel of the receiving conveyer.

The operation of the embodiment illustrated in Figs. 3 and 4 will be apparent from the foregoing description. It is to be observed, however, that the material is first brought into the new line of travel and then upon being discharged

from the translating means falls downward directly into the channel of the receiving conveyer. Although the sheets of material proceed from the discharge of the translating means downward into conveying or traveling position in the receiving conveyer by the action of gravity, a chute in the sense employed in this specification is not necessary. Moreover, the travel of material through this gravity step is not accompanied by a necessary forward movement and change of direction, as required in the types of chutes heretofore employed when material is transferred from one conveyer to another disposed at different elevations. In the foregoing embodiment, and in each of the embodiments described for that matter, the material is translated by positive movement from the terminus of the delivery conveyer and its direction of travel changed during such positive translation to the new line of travel of the receiving conveyer. Such an arrangement avoids the difficulty experienced in connection with gravity chutes in which material passes therethrough with difficulty due to the somewhat tortuous path required to produce the necessary simultaneous horizontal movement and change of direction of travel in passing from the delivery to the receiving conveyer.

Fig. 5 illustrates a still further embodiment of my invention which employs a delivery conveyer of a different type from the receiving conveyer. The delivery conveyer **35** is of the drag type employing a longitudinally extending guideway member **36** disposed in an upright or on-edge position and a conveyer belt **37** arranged to travel substantially in frictional engagement with the guideway. The sheets of material are transported in substantially vertical position between the conveyer belt **37** and the guideway. The receiving conveyer **10** embodies an inlet opening **15** in one of the side members **11**. The delivery conveyer is arranged to feed the material in through this opening. The guideway **36** of the delivery conveyer is extended through the opening **15** and terminates in a curved or arcuate section **38** extending in the direction of the line of travel of the receiving conveyer. The conveyer belt **37** passes around a return roller **39** disposed adjacent to and with its periphery preferably located substantially tangent to the side wall of the receiving conveyer. A suitable guide member **41** is spaced from the guideway **36** and disposed parallel thereto on the inner side of the belt and provided with prong or leg portions **42** arranged to extend on either side of the roller and belt. The leg portions are provided with a curvature similar to that of the terminal section of the guideway **36** and, being spaced slightly therefrom, forms a guide channel through which the sheets of material are carried as they are discharged from the delivery conveyer. In addition, the leg portions **42** of the guide member serve to strip or peel off any message blanks or sheets that may have a tendency to adhere to the belt **37** as it passes around the return roller.

The delivery conveyer may be extended in a suitable direction to receive the material to be transported thereby. Ordinarily, drag conveyers of this type are supported with their guideways transversely in a horizontal position. The terminal of the drag conveyer may be brought into the required vertical position as illustrated and described by twisting the terminal portion of the conveyer guideway in a similar manner to that described and claimed in Patent No. 1,786,343, granted December 23, 1930, to F. Griffith.

In connection with this embodiment the conveyer belt **37**, more particularly the portion thereof extending around the roller **39** acts as the motivating member of the translating means to positively carry the material into the line of travel of the receiving conveyer and at the same time change the direction of the travel of the sheets as they pass from the delivery conveyer. Thus, translating means functioning substantially in the same manner as those of the foregoing embodiments is likewise provided here.

From the foregoing description it will be understood that I have provided an arrangement for connecting two conveyers conveying material in a vertical position and along a substantially horizontal direction so that the material may be effectively transferred from one of the conveyers to the other. A positive movement is given to the material by providing translating means which maintains substantially continuous contact with the material as it travels through the longitudinally extending part of the conveyers and particularly as it passes through the junction between the conveying channels or guideways of the respective conveyers.

Although I have shown my invention in several forms it will be apparent to those skilled in the art that it is not so limited but various other forms and modifications may be employed without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereon as are imposed by the prior art, or as are specifically set forth in the appended claims.

What I claim is:

1. In a conveyer system for sheet material, a delivery conveyer and a receiving conveyer embodying channels disposed out of alinement with relation to each other and arranged to deliver and receive material respectively in a substantially upright position, guide members arranged in upper and lower pairs and disposed at the point where the sheets pass from one conveyer to the other and translating means embodying a moving member disposed between the upper and lower pairs of guide members and arranged to engage one face of the sheets of material and urge them forward along the guide members.

2. In a conveyer system for conveying sheet material, the combination of a delivery conveyer, a receiving conveyer disposed at the end of the delivery conveyer but out of alinement therewith, said delivery conveyer embodying means for forming a longitudinally extending guideway and arranged to approach the receiving conveyer through a substantially horizontal section disposed to deliver sheets of material therefrom in an upright position, said receiving conveyer embodying means forming a horizontally disposed guideway and arranged to receive the sheets of material in an upright position, the guideways of said conveyers being joined by means forming a transfer section, translating means disposed in said transfer section embodying oppositely disposed members arranged to engage the opposite faces of the sheets and hold them in an upright position, said members including a member movable in a direction to urge the sheets along the transfer section with a component of motion in a horizontal direction substantially through the horizontal extent of the transfer section.

3. In a conveyer system for transporting sheet material, a first conveyer comprising spaced side walls forming a longitudinally extending channel, means therein for conveying sheet material

therealong in a substantially vertical position, a second conveyer having a discharge end adjacent the first conveyer and out of alinement therewith, said discharge end being at substantially the same level as the first conveyer and translating means disposed to engage said sheets, said means embodying oppositely disposed members arranged to engage the opposite faces of the sheets, one of said members being driven in a direction for transferring sheet material from the second conveyer to the first in a vertical position and by a horizontal movement.

4. In a conveyer system for conveying sheet material the combination of a receiving conveyer of the V-trough type having a conveyer belt travelling along the bottom of the trough, said conveyer being provided with an inlet opening in one side thereof, a delivery conveyer of the drag type having a conveyer member and a belt arranged to convey material along the conveyer by frictional engagement therewith, said drag conveyer being arranged to discharge material in an on-edge position through said inlet opening into the receiving conveyer, said drag conveyer embodying cooperating members disposed to extend into said inlet opening between which said material is translated therethrough and its direction of travel changed as it enters the receiving conveyer.

5. In a conveyer system for sheet material, the combination of a delivery conveyer arranged to discharge sheets of material in an upright position, a receiving conveyer disposed below the end of the delivery conveyer and out of alinement therewith, translating means at the terminus of the delivery conveyer for bringing the sheets into the line of travel of the receiving conveyer and then depositing the sheets therein, said translating means including a guide member and a motivating member arranged to propel the sheets along substantially the entire length of the translating means before they are dropped and means to form pairs of spaced guide members disposed above and below said motivating member for maintaining the upper and lower edges of said sheets substantially vertical so that they will maintain this position as they enter the receiving conveyer.

6. In a conveyer system for conveying sheet material, the combination of a receiving conveyer of the V-trough type having a conveyer belt travelling along the bottom of the trough, said conveyer being provided with an inlet opening in one side of the trough, a delivery conveyer comprising a conveyer member and a belt arranged to convey material between it and said member by frictional engagement with the belt, said delivery conveyer having a discharge end embodying a belt return roller, said discharge end being rotated into an on-edge position, said conveyer member being arranged to extend in an on-edge position through said opening in the V-trough and arranged to guide material propelled from the discharge of said drag conveyer by said belt as it moves around said return roller.

7. In a conveyer system for conveying sheet material, the combination of a receiving conveyer of the V-trough type having a conveyer belt travelling along the bottom of the trough, said conveyer being provided with an inlet opening in one side of the trough, a delivery conveyer of the drag type comprising a stationary conveyer member, a belt arranged to convey material between it and the said stationary member by frictional engagement with the belt, said drag conveyer having a discharge end embodying a belt return roller, said discharge end being rotated into an on-edge position, the stationary member of said drag conveyer being arranged to extend in an on-edge position through said opening in the V-trough, and a deflector member disposed in spaced relation to said stationary member adjacent said return roller, said deflector member having leg portions extending astride said return roller and into said opening in the V-trough, said stationary member and said deflector member providing a passage-way through which sheets of material, propelled from the discharge of said drag conveyer as it moves around said return roller, may be directed into the V-trough conveyer.

8. In a conveyer system for sheet material, a delivery conveyer and a receiving conveyer disposed in angular relation to each other, said conveyers being arranged to carry sheet material in a substantially on-edge position, translating means arranged to couple the delivery conveyer to the receiving conveyer, said translating means embodying a roller disposed substantially in the apex of the angle between the two conveyers and arranged with its axis of rotation substantially vertical and its periphery disposed substantially tangent to the center lines of the delivery and receiving conveyers, and a belt arranged to engage a substantial peripheral portion of the roller extending between the two conveyers, said belt and said roller cooperating to grip the sheets of material as they are discharged from the delivery conveyer and carry the same into the receiving conveyer.

9. In a conveyer system for sheet material, a receiving conveyer and a delivery conveyer, said receiving conveyer embodying a relatively narrow trough-shaped member along which sheets are carried in a vertical position, and means associated with said member for engaging the sheets and propelling the same therealong, said delivery conveyer embodying means at its terminus for delivering the sheets to the receiving conveyer in upright position, said means embodying a conveying element and a cooperating element disposed to hold the sheets in engagement with the conveying element, said elements being of less width than the sheets and arranged to convey the sheets by engaging the same along their mid-portion and means to form pairs of spaced guide members disposed above and below said cooperating elements in position to guide the lateral portions of said sheets so that they will enter said receiving conveyer in a substantially flat vertical position.

10. In a conveyer system for sheet material, a receiving conveyer and a delivery conveyer, said receiving conveyer embodying a relatively narrow trough-shaped member along which sheets are carried in a vertical position, and means associated with said member for engaging the sheets and propelling the same therealong, said delivery conveyer embodying a pair of cooperating conveyer elements disposed to deliver the sheets to the receiving conveyer in upright position, said elements being of less width than the sheets and arranged to convey the sheets by engaging the same along their mid-portion and means to form pairs of spaced guide members disposed above and below said cooperating elements in position to guide the lateral portions of said sheets so that they will enter said receiving conveyer in a substantially flat vertical position.

11. In a conveyer system for sheet material, a receiving conveyer and a delivery conveyer, said

receiving conveyer embodying a relatively narrow trough-shaped member along which sheets are carried in a vertical position by means of a belt traveling along the bottom of the trough, said delivery conveyer embodying means at its terminus for delivering sheets therefrom in an upright position and for transferring the sheets from the delivery to the receiving conveyer in an upright position, said transfer means embodying a conveying element and a cooperating element disposed to urge the sheets along the transfer means, said elements being of less width than the sheets and arranged to engage same along their mid-portion, and means forming oppositely disposed guide members extending beyond said cooperating elements in the transfer means in position to direct the forward portions of the sheets between the sides of the trough-shaped member of the receiving conveyer as the sheets enter the same.

FRANCIS GRIFFITH.