J. & J. E. SCHUMACHER.

APPARATUS FOR HANDLING PLASTER BOARD OR THE LIKE.

APPLICATION FILED MAY 12, 1917.

1,270,334.

Patented June 25, 1918.

2 SHEETS—SHEET 1.

FIG 1.

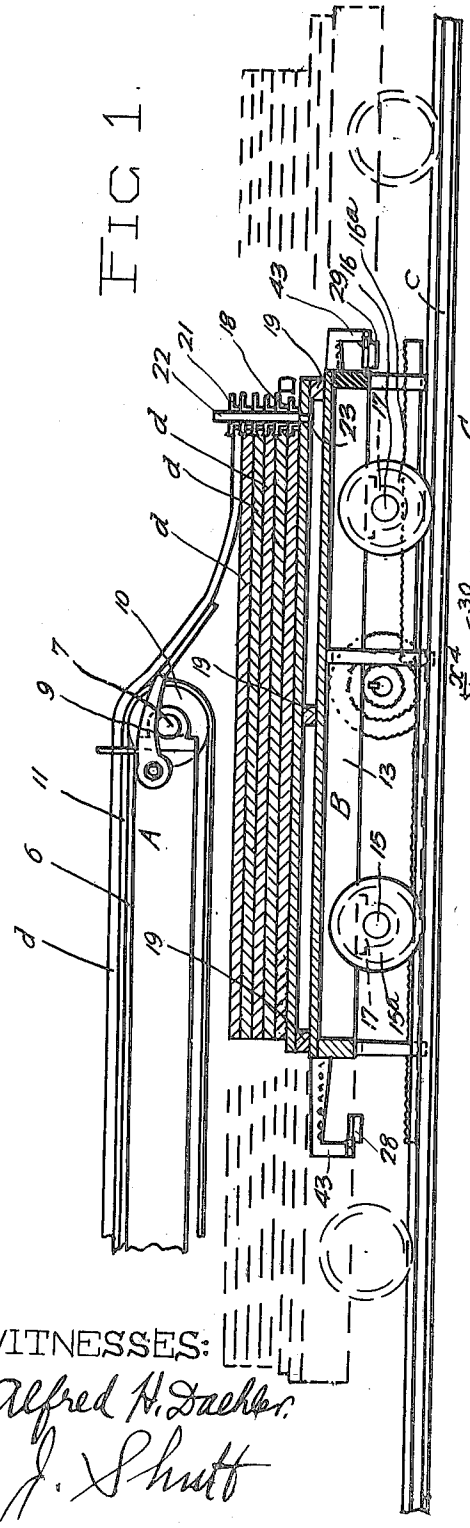
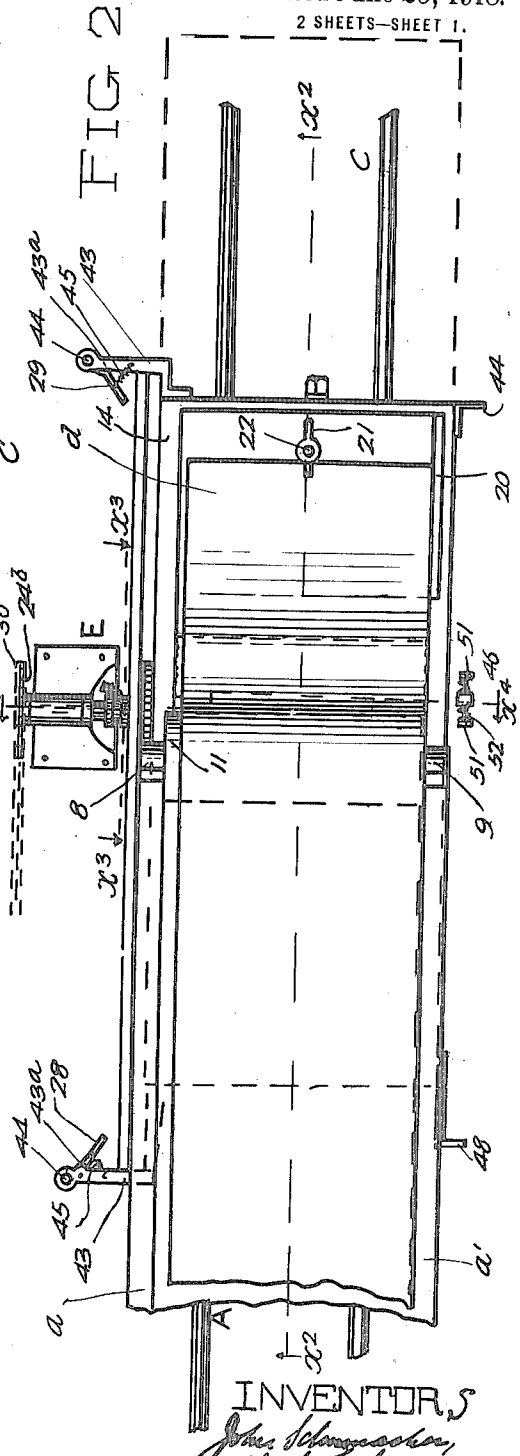


FIG 2



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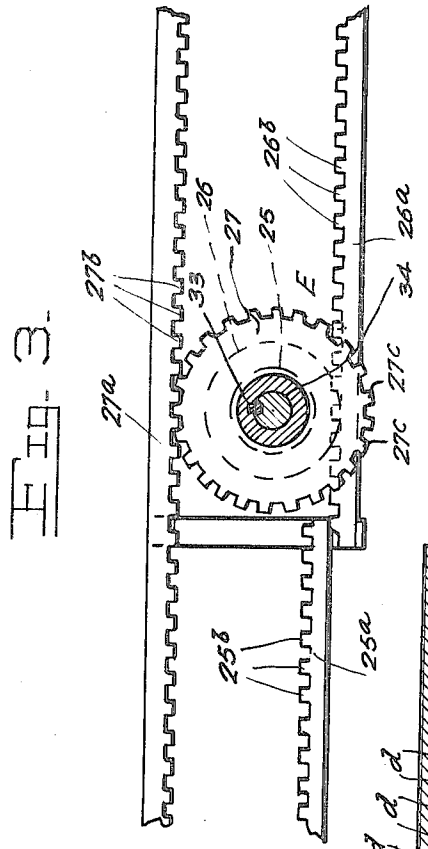


Fig. 3.

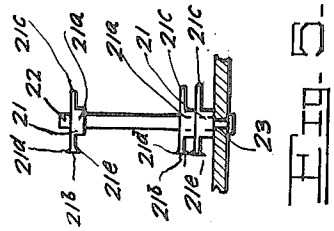


Fig. 5.

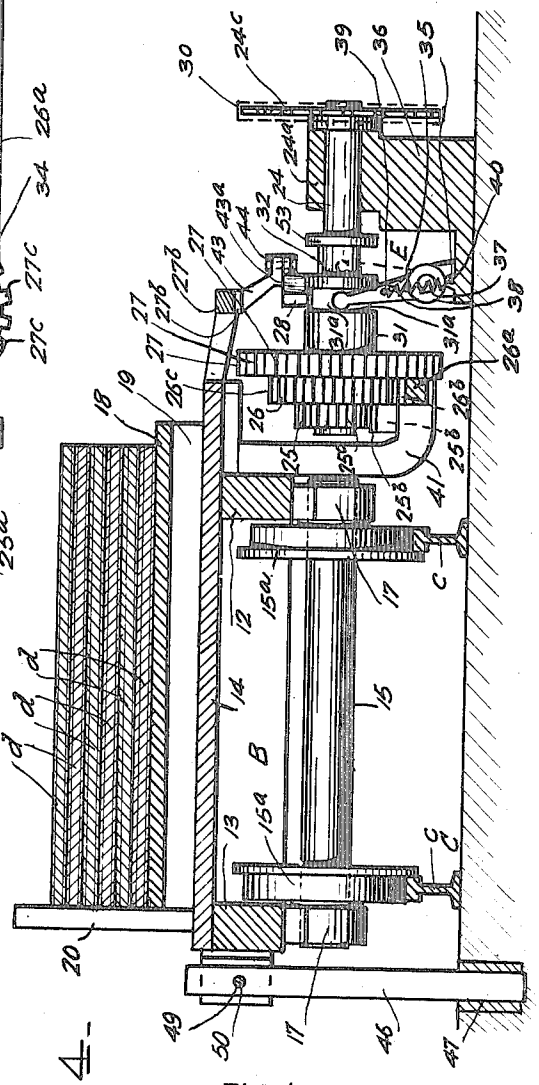


Fig. 4.

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APPARATUS FOR HANDLING PLASTER-BOARD OR THE LIKE.

1,270,334. Specification of Letters Patent. Patented June 25, 1918.

Application filed May 12, 1917. Serial No. 168,215.

To all whom it may concern:

Be it known that we, JOHN SCHUMACHER and JOSEPH E. SCHUMACHER, both citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have jointly invented new and useful Improvements in Apparatus for Handling Plaster-Board or the like, of which the following is a specification.

This invention relates to apparatus for making plaster board and the like, and it has for its object to provide apparatus for carrying out certain steps in the manufacture of plaster board. In Letters Patent of the United States No. 1,176,322, and Letters Patent of the United States No. 1,176,860, granted to us March 21, 1916 and March 28, 1916, respectively, both for processes of making plaster board, we have disclosed and claimed methods of which a certain step or steps, such as stacking of the plaster board, may be carried out by means of apparatus organized in accordance with the present invention. In an application for Letters Patent of the United States filed by us November 2, 1916, Serial No. 129,160, for apparatus for making plaster board, we have disclosed apparatus suitable for carrying out such stacking step or steps, and the present invention is a departure from or improvement upon the apparatus disclosed in such application, the specific form of apparatus disclosed in such application comprising a plurality of cars or the like adapted to be successively presented at a suitable point or zone of discharge of the plaster board, as at the discharge end of a conveyer, while the present invention provides for the reciprocation of a car beneath such point of discharge of plaster board. In the reciprocation of the car it is preferable to have the same at first moved at the same rate of speed as the discharging conveyer or the like until the first end of a length of plaster board is suitably deposited upon such car, or upon a suitable tray mounted upon the car, after which such end may be clamped or gripped, the speed of the car being then increased until the sheet or unit of plaster board has been withdrawn from the conveyer and lies upon the car or the tray thereon, whereupon the car is reversed at preferably a higher rate of speed than either of the forward movements, so that the front end of the car will be in position to receive the next plaster board unit or sheet discharged by the conveyer. It will be understood that such sheets or units are preferably deposited, the first upon the tray, and the next sheet upon the sheet so deposited, and so on until a stack of sheets or units of the proper height is had. After the desired number of units have been so stacked upon the car or on the tray upon the car, the car may be moved out of the zone of conveyer discharge and its place taken by a succeeding car, or, the tray supporting the stack of units may be removed from the car and a fresh tray placed thereon to receive the next stack of plaster board units. Means for causing the reciprocation of the car are provided, and, while such means may assume many forms in practice, without departing from the spirit of the invention, a form is shown in the drawings which moves the car as it is first receiving a unit of plaster board in step with a conveyer until sufficient length of the unit has been deposited thereon to afford a good friction hold, it being understood that a clamp is applied to the unit to further hold the same, after which the means for causing the reciprocation of the car will speed up the car so as to drag the following end of the plaster board off the conveyer and allow the same to fall or be deposited on the car, the means for reciprocating the car then reversing the direction of travel of the car and propelling the car at a higher rate of speed than either of the forward movements, so that the car will be, as before stated, in plaster board unit-receiving position by the time the next succeeding unit is fed over the conveyer. The clamping or holding means provided at the forward end of the car or tray thereon may comprise a plurality of members, each adapted to be applied to a sheet or unit of the plaster board at its forward edge as such sheet is applied to the car or tray. After a car or tray has been loaded it may be set aside so that the plaster board may harden, as disclosed in said Patents No. 1,176,322 and No. 1,176,860 above referred to, or such other disposition as is desired may be made of the tray or car or the plaster board thereon.

With the above and other objects in view, including relative simplicity and inexpensiveness in construction and organization, the invention consists in the novel and useful provision, formation, combination,

association and relative arrangement of parts, members and features, all as hereinafter described, shown in the drawings, and finally pointed out in claims.

In the drawings:

Figure 1 is a fragmentary central vertical sectional view of apparatus, constructed and organized in accordance with the invention, taken on the line x^2—x^2, Fig. 2, and looking in the direction of the appended arrows;

Fig. 2 is a fragmentary plan view of the apparatus shown in Fig. 1;

Fig. 3 is a fragmentary sectional view taken on the line x^3—x^3, Fig. 2, and looking in the direction of the appended arrows, the view being taken upon an enlarged scale;

Fig. 4 is a transverse sectional view taken on the line x^4—x^4, Fig. 2, and looking in the direction of the appended arrows; and

Fig. 5 is an enlarged detail view of the clamping means shown in Figs. 1 and 2.

Corresponding parts in all the figures are designated by the same reference characters.

Referring with particularity to the drawings, in the embodiment of the invention therein shown A designates a conveyer or plaster board feeding device, B designates a reciprocatory car, C designates a track, D designates a tray adapted to be mounted upon the car B, and E designates means for reciprocating the car B and the tray C thereon.

The conveyer A is shown as of the endless band type and the same may form the discharge end of apparatus suitable for disposing a moist, unstable, plastic composition between two surface sheets of flexible material such as paper or the like, and such conveyer is shown as comprising suitably supported frame members a and a', upon which members is mounted a table top or the like 6. A shaft 7 is suitably journaled at the ends of the members a and a' as in journal bearings 8 and 9 and such shaft 7 carries a roller 10 about which an endless conveyer belt 11 is passed. The conveyer belt may be actuated by any suitable actuating means, not shown, as such actuating means may be located at the end of the conveyer opposite the discharge end.

The car B is shown as comprising side frame members 12 and 13, a top or table 14, and a plurality of axles 15 and 16 with their respective wheels 15^a and 16^a. It will be understood that the axle 15 has a wheel 15^a mounted thereon near each of its ends and that the axle 16 has a wheel 16^a mounted thereon near each of its ends. The overhanging ends of the axles are fitted into journal boxes 17 secured to the frame members 12 and 13 beneath the same, as shown in Figs. 1 and 4. The wheels 15^a and 16^a are preferably flanged for co-action with rails c and c', which constitute the track C, such track being in part disposed beneath the discharge end of the conveyer A.

The tray D preferably consists of a suitable table top 18, which is adapted to receive plaster board units discharged by the conveyer, and transverse supporting members 19 which strengthen the table top 18. Side boards 20 may rise upwardly from the table top 18 to form suitable guides for the plaster board units. The tray D may be placed on the table top 14 of the car B and in position to receive plaster board units which are shown at d, such units being of approximately the length of the tray D, and in one manner of making plaster board may be severed before discharge by the conveyer A. In order to grip or clamp the plaster board units d at their leading edges as they are successively presented to the tray D by the conveyer A, a plurality of members 21 are provided, such members being slidably mounted upon a vertical post 22 secured to the table top 18 of the tray D near the leading end thereof, as at 23. Each of the members 21 preferably comprises a collar 21^a bored to fit the post 22 and provided with a projecting finger 21^b at its upper face and a hand grip or handle 21^c. Each finger 21^b is provided with an upwardly ranging point 21^d and a downwardly ranging point 21^e, the fingers 21^b being adapted to sink into the surface of the plaster board sheets at their points of application to the plaster board and the points 21^d and 21^e assist in firmly holding the forward edges of the plaster board units.

The means E is shown as comprising a power-driven shaft 24 having a plurality of pinions 25, 26, and 27 mounted thereon for rotation therewith and slidable longitudinally of the shaft, racks 25^a, 26^a, and 27^a carried by the car, and cams 28 and 29 likewise carried by the car and adapted to shift the pinions 25, 26, and 27 longitudinally of the shaft 24. The shaft 24 is mounted in a suitable fixed journal box 24^a and is provided with a fixed sprocket wheel 24' which may be driven by means of a chain 30 from any suitable source of power. The pinions 25, 26, and 27 are preferably formed integrally on a hub 31, which hub has a circumferential groove 31^a formed therein. A feather or spline 32 is inset into the shaft 24 where it overhangs the bearing 24^a and where the pinions are fitted to the shaft. The pinion hub 31 is formed with a channel 33 at its central bore 34, this complementary formation of pinion hub and shaft providing for rotation of the pinions upon shaft rotation, and permitting the pinions to slide longitudinally of the shaft for a limited distance as determined by the cams 28 and 29 on the car B, it being understood that the cams are arranged one at each end of the

car, so that when the car approaches the limit of its travel in either direction the corresponding cam will shift the pinion by entering the circumferential channel 31ª in the pinion hub 31. In order to maintain the pinions in either of their positions of adjustment as determined by the cams 28 and 29, a finger 35 is pivoted to the base 36 of the journal box 24 as at 37, the other end of the finger 35 extending into the groove 31ª of the pinion hub 31. A relatively strong spring 38 is secured to the finger above its point of pivotal connection as at 39 and secured to the base 36 as at 40. The point of pivotal connection of the finger with the base 36 is in a plane lying between the planes of the circumferential groove 31ª in the hub 31 when such hub is in either of its positions of adjustment, and the spring 38 is secured to the base in the same vertical plane as the finger is pivoted, this arrangement serving to prevent displacement of the pinions from either of their positions of adjustment until the next cam-action. The pinion 25 is the smallest of the set of pinions and is employed for propelling the car during the first stages of its movement as it receives a plaster board unit from the conveyer, the pinion 26 being somewhat larger than such pinion 25 and being employed to propel the car in its final forward movement, while the pinion 27 is much larger than either of the other two pinions and comes into play to return the car to its position beneath the conveyer and in position to receive the next succeeding plaster board unit. The rack 25ª and the rack 26ª are supported beneath the car as by brackets 41, and such racks are provided with upwardly facing teeth 25ᵇ and 26ᵇ respectively. The rack 25ª is disposed in the plane of rotation of the pinion 25, and the rack 26ª is disposed in the plane of rotation of the pinion 26 when such pinions 25 and 26 are in the position of adjustment shown in the drawings, it being understood that the pinion 25 is provided with teeth 25ᶜ which are adapted to mesh with the teeth 25ᵇ of rack 25ª, and the pinion 26 is provided with teeth 26ᶜ adapted to mesh with the teeth 26ᵇ of the rack 26ª. The rack 27ª is provided with downwardly facing teeth 27ᵇ, which teeth are adapted to mesh with teeth 27ᶜ on the large pinion 27 when the pinions are shifted so as to withdraw the pinions 25 and 26 from engagement with the respective racks 25ª and 26ª and cause the meshing of the teeth 27ᶜ on the pinion 27 with the teeth 27ᵇ of the rack 27ª. The rack 27ª is supported by means of brackets 42, one of which may be provided at each end of the car B, and such brackets may have downwardly ranging extensions 43 formed thereon, one of the extensions 43 carrying the cam 28 and the other of the extensions 43 carrying the cam 29. The cams 28 and 29 are pivoted to their respective brackets 43 as at 44 and are arranged to be held against shoulders 43ª provided on the brackets 43 by light springs 45 which permit of outward movement of the cams when the car begins to return. It will be understood that when the car is about to be reversed in direction of movement the respective cam is entering the groove 31ª near the pinion hub and forces the pinions into the proper position of adjustment to reverse the motion of the car, and the pinions will be so held in their positions of adjustment along the shaft 24 by means of the finger 35 and its strong spring 38. The pivotal connection of the cams permits the cam to move outwardly as the car begins to reverse, so as not to disturb the pinion adjustment.

A removable stop post 46 may be placed in a suitable fixed socket 47 and in position to be engaged by lugs 48, one of which is provided at each end of the car and in the plane of the removable post 46. The post 46 may have a spring buffer arranged thereon, a convenient form of buffer comprising a slidable bar 49 passed through an aperture 50 in the post and headed at each end as at 51, compression springs 52 being provided between each head 51 and the post. The heads 51 are arranged in the path of travel of the lugs 48.

As will be clear from an inspection of Fig. 3, the rack 25ª extends only partially the length of the car and the rack 26ª extends through the remainder of the car length. The reversing rack 27ª is arranged to extend the full length of the car.

The operation, method of use and advantages of the invention will be readily understood from the foregoing disclosure, taken in connection with the accompanying drawings and the following statement:

The pinions being thrown to the position shown in the drawings, the pinion 25 and the pinion 26 will be in the plane of their respective racks, and upon rotation of the shaft 24 through its driving sprocket and in the proper direction, the pinion 25 will, through the rack 25ª, propel the car forward at practically the same speed as the conveyer belt is driven, so that a plaster board unit may be deposited upon the tray and secured thereon by pressing downwardly upon one of the members 21 and engaging the finger 21ᵇ thereof with the plaster board unit, it being understood that the members 21 may be frictionally held by the post above the plane of plaster board unit application to the tray and that an operator may readily apply the lowermost of the same to the sheet or unit of plaster board by pressing downwardly thereon. As in a portion of the forward travel of the car the rate of car movement and conveyer move-

ment is the same, the leading end of the plaster board unit being delivered by the conveyer will be evenly placed on the car or the tray thereon, after which the car may be speeded up to drag the remaining portion of the unit from the conveyer and at a rate of speed faster than the conveyer speed. Such speeding up automatically takes place on account of the rack 25^a leaving its pinion 25 at the point where the rack 26^a begins and the meshing of the pinion 26 therewith takes place. The pinion 26 being larger than the pinion 25, the car will consequently be driven at a higher rate of speed than when driven by the pinion 25. After the car reaches the end of its forward travel the rear lug 48 strikes its buffer head 51 to arrest the motion of the car and the cam 28 enters the circumferential groove 31^a in the pinion hub 31, and as will be seen from an inspection of Fig. 2, the cam 28 lies in an oblique plane such as will force the pinion hub against the bearing 24^a or a thrust collar 53 interposed between the bearing 24^a and the hub 31. The finger 35 following the hub 31 will maintain the same in such position of adjustment until disturbed by the cam 29 as the cam 28 may upon return motion be thrown outwardly and slide through the groove 31^a in the hub 31 of the shifting pinions. As the pinions are shifted as just described the pinions 25 and 26 are thrown out of mesh with their respective racks 25^a and 26^a and the pinion 27 is thrown into mesh with the receiving rack 27^a, whereupon the reverse movement of the car takes place, such reverse movement being at a much higher rate of speed than either of its rates of speed of forward movement, due to the greater dimensions of the pinion 27. During the forward travel of the car the plaster board unit will have been in its entirety deposited thereon and as the car reaches the end of its travel backward or reversely the cam 29 reverses the pinions by entering the circumferential groove 31^a in the pinion hub 31, forcing the pinions 25 and 26 into the plane of their respective racks, while the pinion 27 is withdrawn from the plane of its rack and from mesh therewith. The car is then again moved forwardly by the action of the pinion 25 upon its rack 25^a and a further plaster board unit may be applied by clamping its forward edge by means of one of the members 21 and the same will be caused to overlie the previously loaded or deposited plaster board unit. The reversal of the car movement being automatic, it is only necessary to clamp on the leading edges of the plaster board units as they are successively fed by the conveyer until a stack of the desired number of units is had. The tray may then be removed from the car and replaced by another, or the post 46 may be lifted from its socket and the car moved along the tracks and out of the zone of conveyer discharge and be replaced by another car if desired.

It will be understood that many variations and departures may be made from the specific disclosure herein without departing from the spirit of the invention and the terms of the following claims.

Having thus disclosed our invention, we claim and desire to secure by Letters Patent:

1. In output discharge means, a member from which output in unstacked relation is successively delivered, a member for receiving said output successively and maintaining said output in stacked relation, and means for successively presenting said output-receiving member in position for reception of output and in positive timed relation to the delivered output; said output-receiving member being adapted for reciprocation, and said means operating to reciprocate said member and being adapted to cause the traveling of said member at differential speeds during its travel in output-receiving direction and in its travel to output-receiving position.

2. In output discharge means, a member from which output in unstacked relation is successively delivered, a member for receiving said output successively and maintaining said output in stacked relation, and means for successively presenting said output-receiving member in position for reception of output and in positive timed relation to the delivered output; said last-named means comprising mechanism for moving said output-receiving member at first in step with said delivery member and then at a higher rate of speed during travel in output-receiving direction and being adapted to return said output-receiving member to output-receiving position at a still higher rate of speed.

3. In output discharge means, a member from which output in unstacked relation is successively delivered, a member for receiving said output successively and maintaining said output in stacked relation, and means for successively presenting said output-receiving member in position for reception of output and in positive timed relation to the delivered output; said last-named means comprising mechanism for moving said output-receiving member at first in step with said delivery member and then at a higher rate of speed during travel in output-receiving direction and being adapted to return said output-receiving member to output-receiving position at a still higher rate of speed; said member being provided with means for engaging the output.

4. In output discharge means, an output delivery member, an output-receiving member to which output is successively delivered

therefrom, and means for successively presenting said output-receiving member in position for reception of output and in positive timed relation to the delivered output; said last-named means comprising mechanism for moving said output-receiving member at first in step with said delivery member and then at a higher rate of speed during travel in output-receiving direction and being adapted to return said output-receiving member to output-receiving position at a still higher rate of speed; said member being provided with means for engaging the output; said last-named means comprising a plurality of members adapted for engagement each with a unit of the output.

5. In apparatus of the character disclosed an output delivery member, a reciprocatory member adapted to receive successively delivered units of the output and in stacked relation, and means for reciprocating said last-named member beneath the point of output delivery; said reciprocation means comprising mechanism for successively presenting said reciprocatory member to said delivery member and causing the travel of said reciprocatory member at different rates of speed during its travel in output-receiving direction and its return to receiving position.

6. In apparatus of the character disclosed, an output delivery member adapted to successively deliver flexible units in sheet form, a member adapted for reciprocation beneath the point of delivery of such units, and means for reciprocating said last-named member; said reciprocating means being adapted to move said reciprocatory member to output-receiving position and then move said reciprocatory member in step with said delivery member during a portion of its forward travel and increase the rate of speed of said reciprocatory member during the remaining portion of its forward travel.

7. In apparatus of the character disclosed, an output delivery member adapted to successively deliver flexible units in sheet form, a member adapted for reciprocation beneath the point of delivery of such unit, and means for reciprocating said last-named member; said reciprocating means being adapted to present said reciprocatory member to output-receiving position and then move said reciprocatory member in step with said delivery member during a portion of its forward travel and increase the rate of speed of said reciprocatory member during the remaining portion of its forward travel; said reciprocation means being further adapted to return said reciprocatory member to receiving position at a higher rate of speed than the speed during the forward travel thereof.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN SCHUMACHER.
JOSEPH E. SCHUMACHER.

Witnesses:
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WILLIS S. MITCHELL.