A. M. BATES.

BAGGING MACHINE.

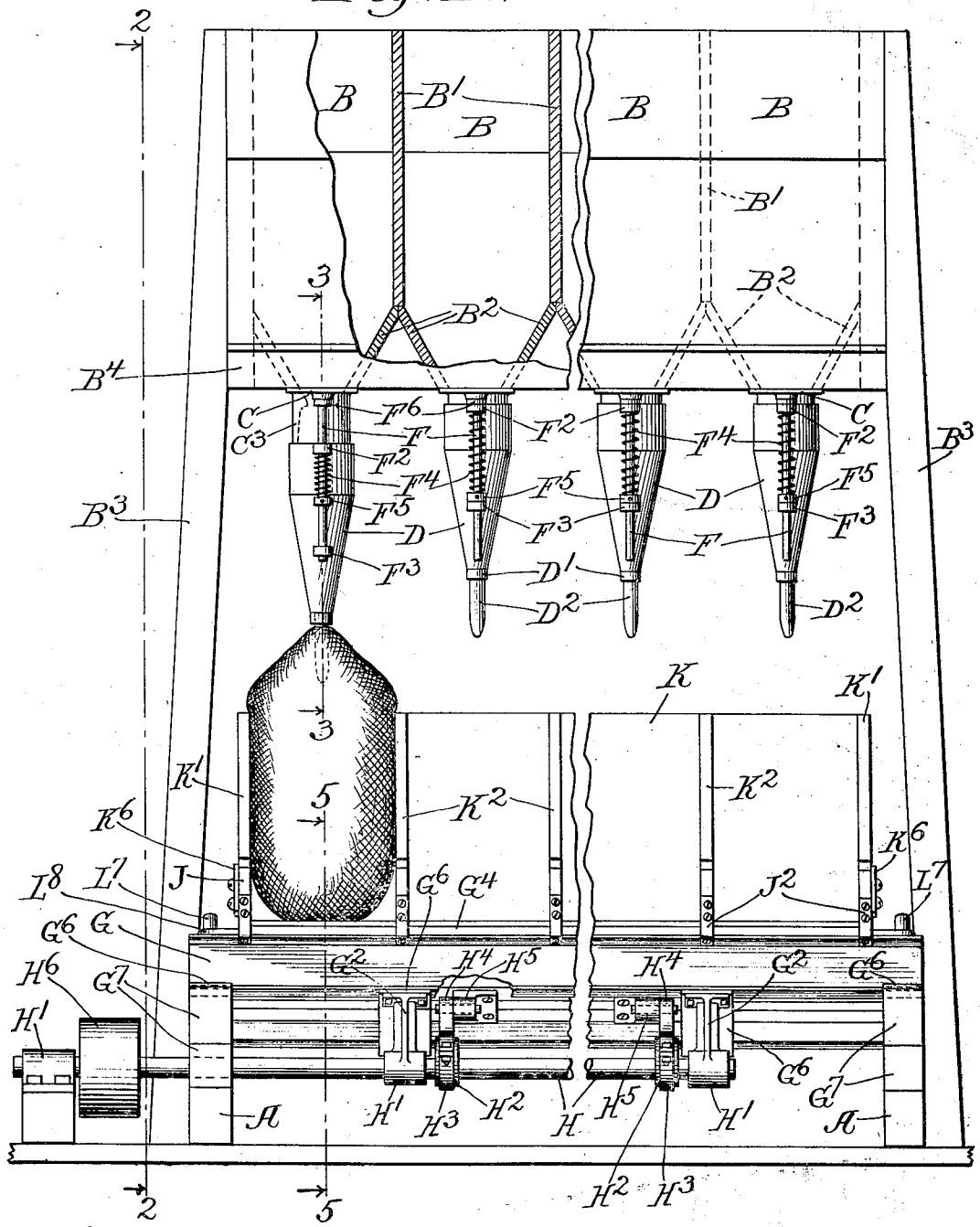
APPLICATION FILED MAY 16, 1906.

1,017,369.

Patented Feb. 13, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

Edward T. Wray.

Percival H. Truman.

Inventor.

Adelmer M. Bates.

by Parker & Clarke

Attorneys

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3 SHEETS—SHEET 2.

Fig. 4.

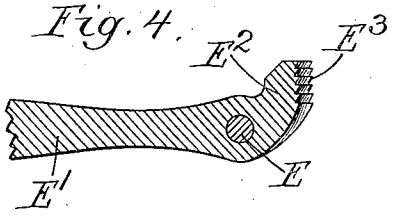


Fig. 3.

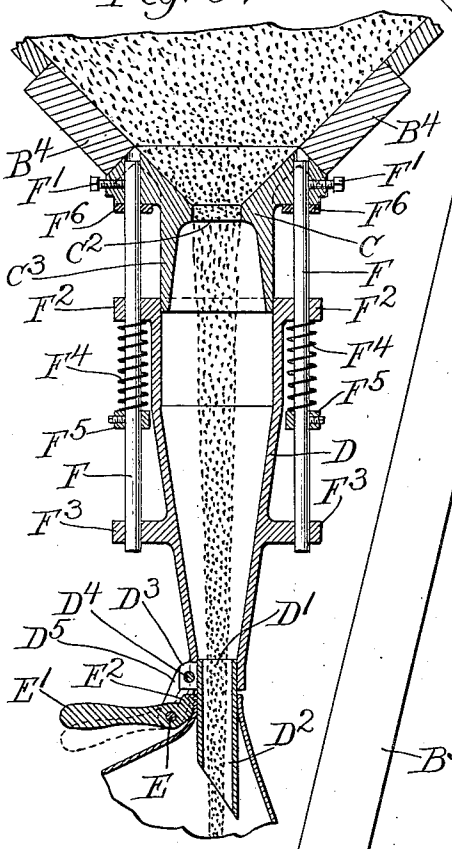
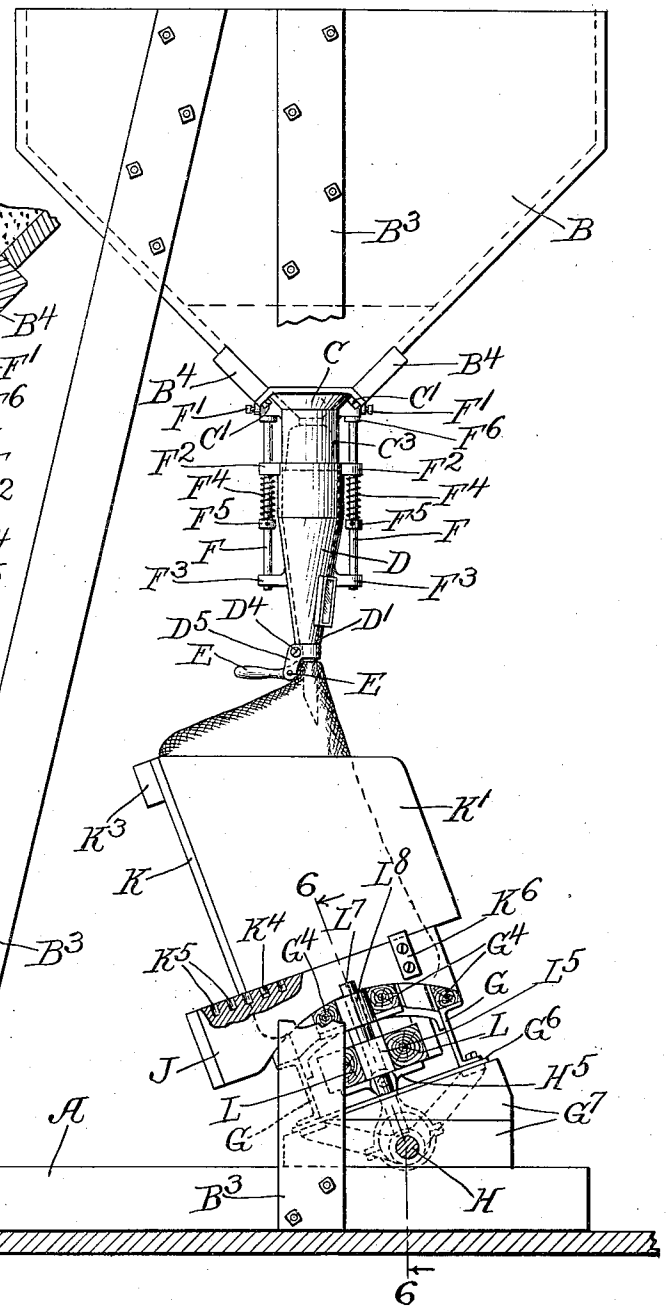


Fig. 2.



Witnesses.

Edward T. Wray.

Percival H. Ritman.

Inventor:

Adelmer M. Bates.

by Parker & Carter

Attorneys.

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3 SHEETS—SHEET 3.

Fig. 7.

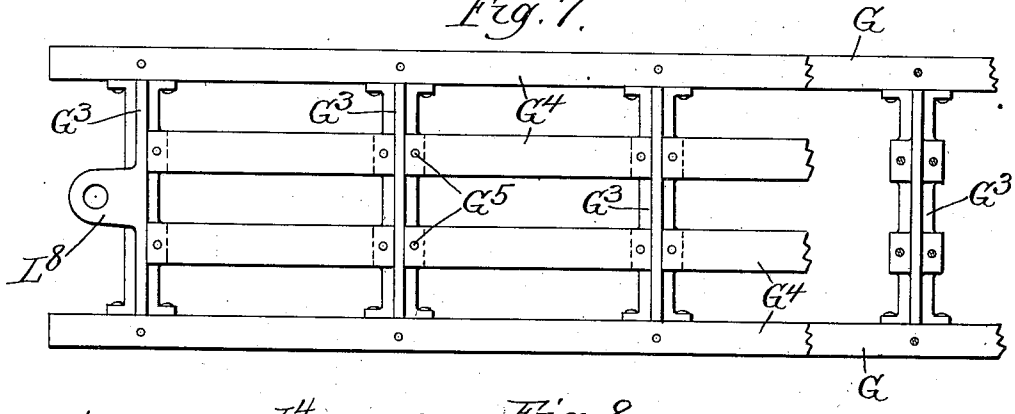


Fig. 8.

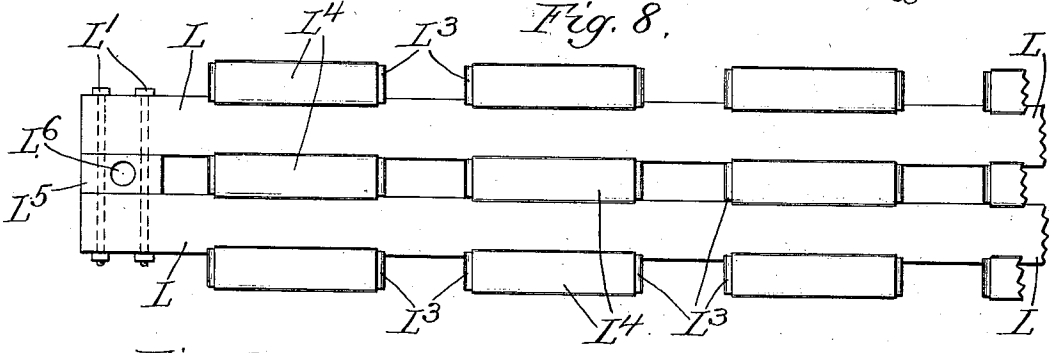


Fig. 5.

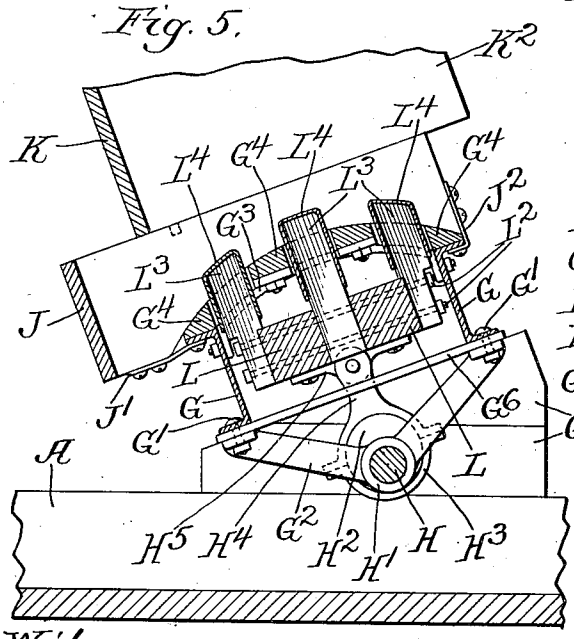
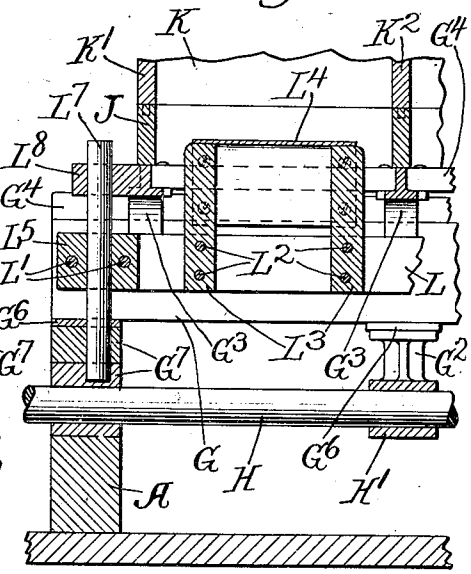


Fig. 6.



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Adelmer M. Bates.

by Parker Carter

Attorneys.

UNITED STATES PATENT OFFICE.

ADELMER M. BATES, OF CLEVELAND, OHIO, ASSIGNOR TO BATES VALVE BAG COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF WEST VIRGINIA.

BAGGING-MACHINE.

1,017,369. Specification of Letters Patent. Patented Feb. 13, 1912.

Application filed May 16, 1906. Serial No. 317,069.

To all whom it may concern:

Be it known that I, ADELMER M. BATES, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Bagging-Machines, of which the following is a specification.

My invention relates to machines for filling receptacles, particularly receptacles having relatively small filling openings, for example, valve bags or the like.

The invention makes a practical application of the well known physical principle that a stream of material acted upon by gravity tends to become attenuated in the course of the fall of the material.

The invention contemplates, among other things, causing the material to be fed through an opening of a size sufficient to practically prevent the clogging of the material, but at such a distance above the relatively contracted opening of the receptacle that it will feed freely into the receptacle without hindrance.

The invention has for its object also certain new and improved means for holding the receptacle, for agitating the same so as to pack the material therein, and for releasing it when the filling process has been completed.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a front elevation of the machine with parts in section; Fig. 2, a view on line 2—2 of Fig. 1; Fig. 3, a vertical section on line 3—3 of Fig. 1; Fig. 4, a detail of the clamping cam; Fig. 5, a vertical section on line 5—5 of Fig. 1; Fig. 6, a section on line 6—6 of Fig. 2; Fig. 7, a plan view of the bag carrier, and Fig. 8, a plan view of the agitating device.

Like letters of reference indicate like parts in all the drawings.

I have shown and shall particularly describe my invention as applied to a machine for filling bags, but it will be evident that receptacles other than bags might be handled without material variation.

The machine which I have shown consists of a battery of several bag filling devices which may be operated together. The apparatus is mounted upon a base plate A. Above this plate are supported a plurality of feed hoppers B, B, B, B. These are shown as distinct receptacles, although that will not be essential under all conditions, these several hoppers being designed to feed into the several filling tubes to be described later. The hoppers B may be constructed in any desired manner. I have shown them as consisting of the vertical containing walls B^1 B^1 and the slanting bottom parts B^2 B^2. This structure is supported from the base plate by the uprights B^3 B^3. Secured between the beams B^4 B^4 which form parts of the bottom of the hoppers on each side are the hollow castings C. There will be one of these castings for each of the hoppers, but it will be sufficient to refer to and describe a single hopper and its associated parts as it is intended that feeding devices connected with each of the hoppers should be the same.

The casting C is shown as bolted to the beams B^4 by the bolts C^1 C^1. This casting is formed with the central throat C^2 and with the extended vertical flange C^3. This casting forms the stationary section of the filling tube which is designed to be extensible. The lower movable section of the filling tube consists of a casting D extending over the end of the casting C and tapering so as to have a relatively contracted outlet or throat D^1 at the lower end. To the end of the casting D is secured the spout D^2 which is preferably cut off obliquely for convenience in inserting into the filling opening of the bag. The lower end of the casting D is split and provided with a pair of lugs D^3 through which passes the bolt D^4 and a pair of downwardly extending lugs D^5 between which is pivoted at E the handle E^1 of the bag clamping cam E^2. This cam is preferably provided with the upturned ratchet teeth E^3. The full line position, Fig. 3, shows the cam E clamping the bag against the spout D^2. The dotted line position shows the cam released from the bag.

The filling tube, as has been intimated, is preferably made extensible, the two parts being preferably held in their collapsed positions by a spring, the tension of which will be overcome by the weight of the material entering the bag. The left hand feed-

ing apparatus of Fig. 1 shows the filling tube extended. The other three tubes, it will be seen, are in their normally collapsed positions. Any desired form of collapsible tube may be utilized. I have shown, connected with the filling tube, a pair of guide rods F F fixed in the casting C by means of the set screws F^1 F^1 and passing loosely through the upper lugs F^2 F^2 and the lower lugs F^3 F^3 on the casting D. Springs F^4 F^4 are interposed between the lugs F^2 and the collars F^5 F^5 fixed on the rods F. Buffers F^6 F^6 will preferably be placed at the upper end of the rods.

It will be seen that the bag is clamped to the filling tube. This will perhaps not be necessary under all circumstances, but it is my preferred arrangement. I also prefer to support the bag from the bottom. This may not be necessary under all conditions, but it is very desirable, particularly when the bags are of considerable size or when they are to be filled up completely. I have shown all of the bags which the machine is designed to fill as supported on a single carrying structure suitably made so as to provide a separate support for each of the bags. This carrier is shown in plan in Fig. 7 and in elevation in Figs. 2, 5 and 6. It consists of a bowed or convexed frame work designed to give a saddle back support for the bags, thereby insuring the complete filling of the corners. I have shown this structure as comprising a pair of channel irons G G connected by suitable bolts G^1 G^1 to the angle iron supports G^2 G^2 bearing upon the driving shaft H. The channel irons are connected by the curved castings G^3. Upon these channel irons and upon these castings are the longitudinal beams or strips G^4 G^4 preferably of wood and bolted to the iron work by the bolts G^5 G^5. In order to vary the elevation of the carrying structure one or more shims G^6 may be interposed between the channel irons G and the supports G^2. The carrying structure is shown as tilted back as in this particular form of machine the bag is intended to be filled through an opening in the corner as shown. The carrier will rest upon the end blocks G^7 G^7.

I also prefer to provide the machine with a back rest for the bags. As the bags may differ considerably in girth it is desirable to have this support adjustable. I have shown the support as consisting of the lower box or frame work J secured to the carrier by the straps J^1, J^2 and of an upper adjustable structure consisting of a back board K, end pieces K^1 K^1 and dividing partitions K^2 K^2, the parts being preferably braced by the beam or strip K^3. The upper or adjustable section is provided with dowel pins K^4 which may be set into perforations K^5 K^5 in the lower section so as to give the former any desired position. Straps K^6 on the lower section are arranged to overlap the upper section.

My machine also has means for agitating the bags during the process of filling so as to insure the proper packing of material. Preferably this agitating means operates directly on the bottoms of the bags through the slots or apertures in the carrier. This jigging or agitating device is shown in plan in Fig. 8. It consists of a frame work designed to be reciprocated by eccentric mechanism connected with the driving shaft and having upstanding members which intermittently strike the bottoms of the bags. This structure consists of two beams L L fastened together at the ends by the bolts L^1 L^1. The upstanding members or jiggers are secured to these beams by the bolts L^2 L^2 and preferably consist of pairs of uprights L^3 L^3 which may be of wood, over which is the metal sheathing L^4. Blocks L^5 secured at each end to the jigging device between the beams L are provided with apertures L^6 through which extend the guiding pins L^7 secured at the upper end to the lugs L^8 in the carrier frame and at the lower end fixed in the end blocks G^7. The driving shaft H is supported in suitable bearings H^1 H^1 and carries a number of eccentrics H^2. These eccentrics have the customary straps H^3 provided with extensions H^4 pivoted to castings H^5 on the bottom of the jigger frame. The shaft H has the driving pulley H^6 which may be driven from any desired source of power. When the shaft H is revolved it will be obvious that the upstanding parts of the agitating device will be drawn in and out of the slots in the carrier frame, the whole jigging structure playing up and down on the guide rods L^7.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described for obvious modifications will occur to any person skilled in the art. In a machine of this character precise arrangements and constructions are necessarily dependent to a large extent upon the size, character and number of the receptacles which the apparatus is calculated to handle.

I have chosen one form of bagging device for the purpose of illustrating the various features of my invention, some of which may, of course, be omitted under some circumstances and for others, substitutions may be made, according to the exigencies of the particular case.

The use and operation of my machine are as follows: The bag will be first clamped upon the filling tube and a charge of material will then be deposited in the appropriate hopper. This may be done automatically or by hand. I have not shown any particular means for filling the hoppers, as that forms no part of the invention in ques-

tion. The material, by force of gravity, will begin feeding down through the throat C^2 in the bottom of the hopper. This throat is made large enough so that there is no danger of clogging. It will ordinarily have to be considerably larger than the filling opening of the bag. The stream of material passing through the throat C^2 will, therefore, have to be considerably diminished or attenuated before it reaches the filling opening of the bag and this I prefer to accomplish by placing the bag at a sufficient distance below the throat C^2 so that the stream of material will pass through the same without hindrance. This method of gravity feeding has marked advantages for certain kinds of material over the method of filling through a funnel or tapered filling tube insomuch as the liability for clogging is very much lessened. In filling large numbers of bags having relatively contracted filling openings and at a high rate of speed, this is an important feature. As the material feeds into the bag, it will cause the same to sag down or extend and to accommodate for this the filling tube is constructed to be extensible or elastic. It will be seen, therefore, that the distance of fall of the material between the throats C^2 and D^1 increases during the process of filling. The stream entering the throat D^1, therefore, tends to become more attenuated as the filling progresses. Thus, if at first there is any tendency to clog at the mouth of the bag, this tendency is automatically overcome as the filling goes on.

I prefer to support the bag at the bottom and also at the back and sides. It will, therefore, be evident that some difficulty might arise in separating the filling tube and the bag when the filling has been accomplished. This difficulty is, however, obviated by the structure of my filling tube. The operator merely grasps the handle E^1 and throws it down to the dotted line position of Fig. 3, releasing the teeth E^3 from the material of the bag. The spring F^4 will immediately retract the filling tube, drawing the spout D^2 out of the mouth of the bag. The operator may still keep his hold on the handle, thus guiding the filling tube back to its collapsed position so as to prevent jar of the apparatus. When the handle has been pulled up to set the cam, it will be seen that the weight added to the bag by the incoming material tends to tighten the grip of the teeth E^3 on the bag. During this time, it will be understood, the bag has been subjected to agitation by the jigging device. The position of the bag on the saddle back support insures the packing of the material into the corners. The jiggers, it will be seen, operate directly upon the bottom of the bag. At the same time the bag rests upon a stationary support so that it is not subjected to any severe strain as might be the case if it had no other support than the clamp at the upper end.

I claim:

1. In a filling machine the combination of a supply hopper having a discharge throat, with a filling throat tube smaller in cross section than the discharge throat, and vertically beneath the discharge throat, means for attaching the receptacle to be filled to the filling throat, and a telescopic tube connecting and inclosing the two throats, said tube larger in cross section at its smallest point than the filling throat tube.

2. In a bag filling machine, the combination of a hopper having a lower discharge throat with a filling tube smaller in cross section than the discharge throat, means for supporting the tube directly beneath and at a distance from the discharge throat, means for holding the bag beneath such filling tube, and a yielding connection between the filling tube and the hopper comprising springs interposed between overlapping projections rigidly connected respectively with the tube and the hopper whereby the former is elastically supported on the latter.

3. In a bag filling machine, a bag carrier having a convex upper surface on which the bag is adapted to rest.

4. In a bag filling machine, a bag carrier having a convex upper surface on which the bag rests, in combination with means for supporting the bags at their upper ends.

5. In a bag filling machine, a bag carrier comprising a bottom part having a convex surface upon which the bag is adapted to be supported, and a back rest adjustable with respect to the bottom part.

6. In a bag filling machine, the combination of a slotted convex bag carrier, with an agitating device comprising a plurality of reciprocating members adapted to operate through the slots in the carrier.

7. In a bag filling machine, the combination of a feed hopper, with a gravity filling tube means for elastically mounting said tube, means for attaching the bag to the tube, a bag carrier to support the bags from below, and means comprising an agitating device operative immediately against the bottoms of the bags for forcing material into the lower corners of the bags.

8. In a bag filling machine, the combination of a hopper having a lower discharge throat, a filling tube smaller in cross section than said throat located about the same vertical axial line as said discharge throat and removed therefrom, a casing supporting one end of said filling tube and slidably mounted about the discharge throat, said casing of such cross sectional area that a truncated cone bounded by the discharge throat and filling tube will be within and removed from the walls of said casing.

9. In a bag filling machine, the combination of a supply hopper having a discharge throat, a filling throat tube smaller in cross section than the discharge throat and vertically beneath it, a casing inclosing the space between said discharge throat and filling throat tube and means for setting up a current of material between said discharge throat and filling throat tube, said current adapted to remain out of contact with the walls of said casing.

ADELMER M. BATES.

Witnesses:
R. J. BULKLEY,
NINA L. STRUTHERS.