

No. 652,637.

Patented June 26, 1900.

H. N. POTTER.
PRESS FOR FORMING TUBES.

(Application filed Aug. 14, 1899.)

(No Model.)

Fig. 1

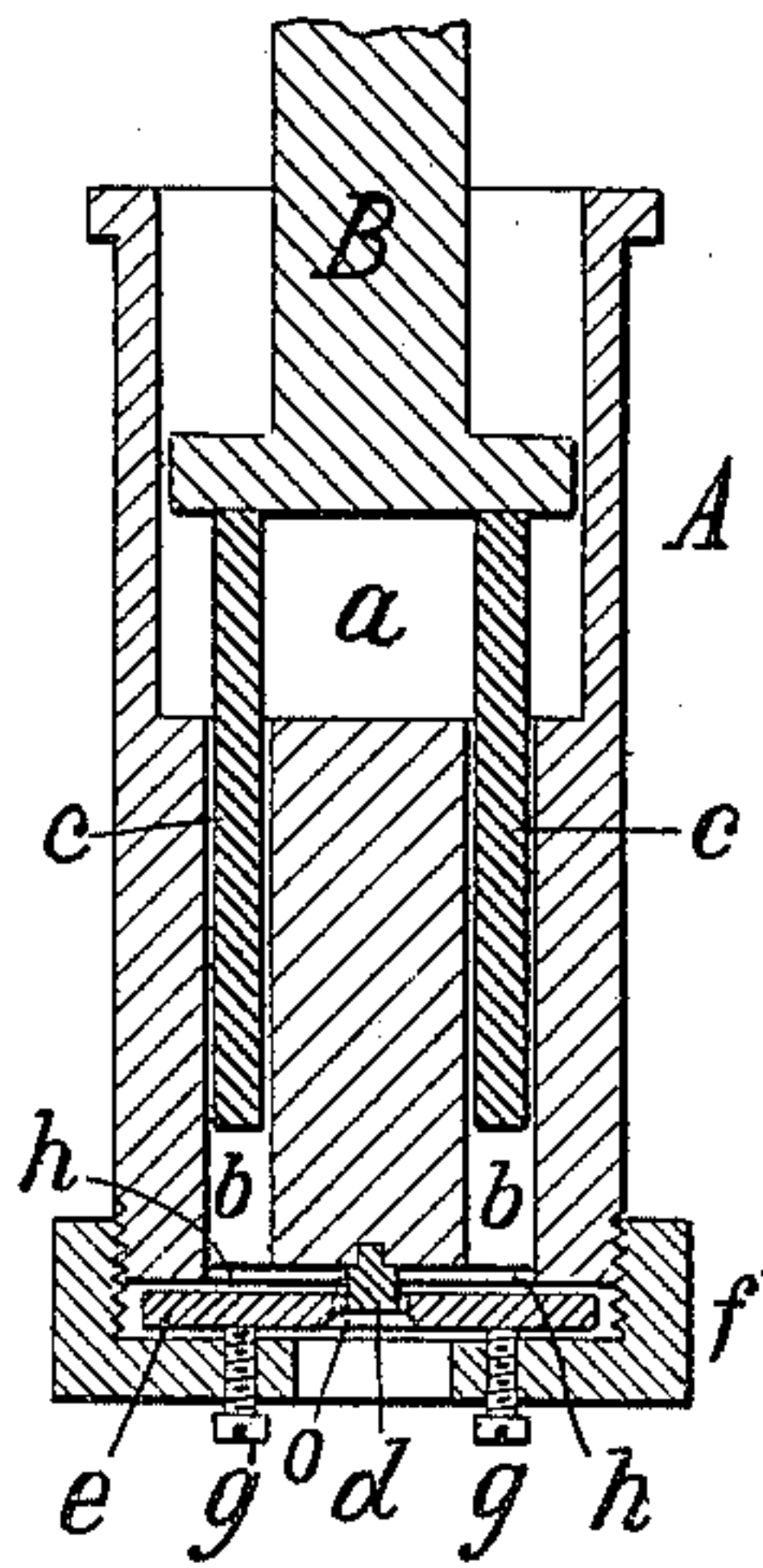


Fig. 2

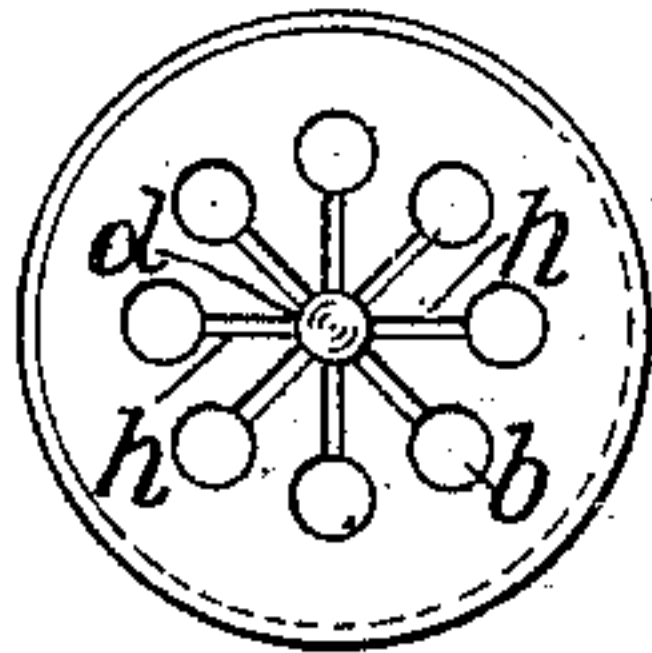


Fig. 3

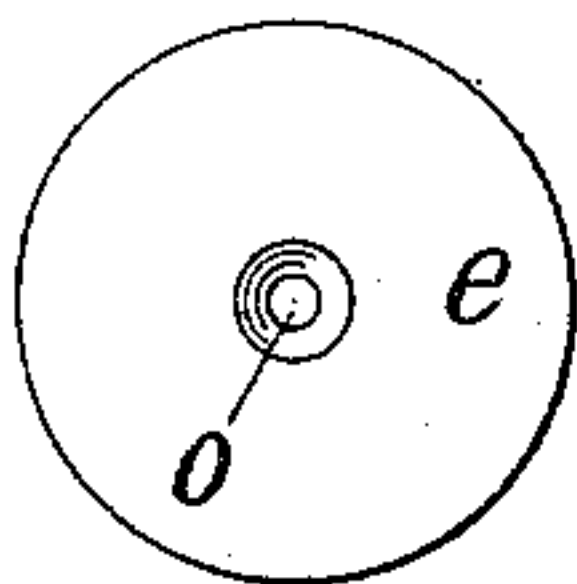
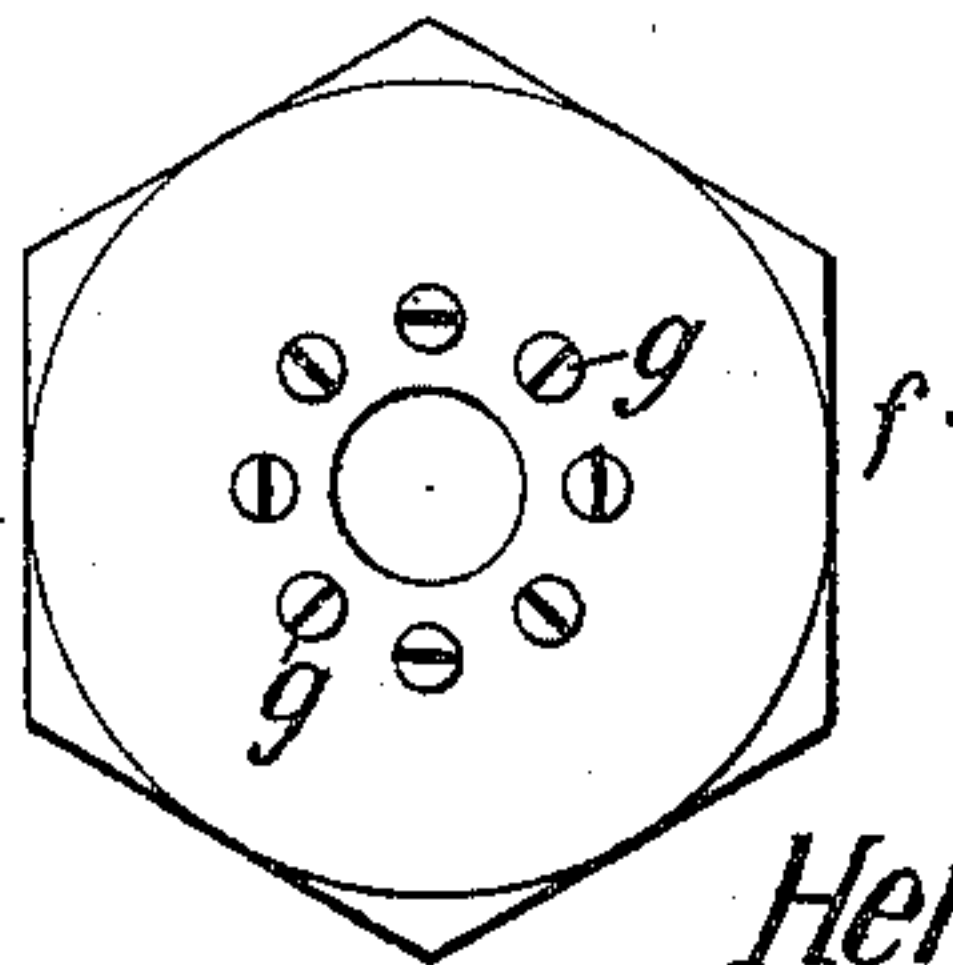


Fig. 4



Witnesses:

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by Charles A. Perry, Atty

UNITED STATES PATENT OFFICE.

HENRY NOEL POTTER, OF GÖTTINGEN, GERMANY, ASSIGNOR TO GEORGE WESTINGHOUSE, OF PITTSBURG, PENNSYLVANIA.

PRESS FOR FORMING TUBES.

SPECIFICATION forming part of Letters Patent No. 652,637, dated June 26, 1900.

Application filed August 14, 1899. Serial No. 727,149. (No model.)

To all whom it may concern:

Be it known that I, HENRY NOEL POTTER, a citizen of the United States of America, residing in Göttingen, Germany, have invented certain new and useful Improvements in Presses for Forming Tubes, of which the following is a specification.

In handling the materials which enter into the composition of glowers for lamps of the Nernst class with the object of constructing such glowers in tubular form I have been led to make improvements in the apparatus for manufacturing the tubular bodies from pasty material, and these improvements form the subject of the present invention. When tubular bodies are used as the glowers of electric lamps and are subjected to the great heat necessary in order to maintain a state of incandescence, it is essential that such bodies should be perfectly even and uniform in their structure. Otherwise the walls are likely to collapse and the glowers to be destroyed. When I attempted to make tubular glowers by the known process of manufacturing tubes from pasty matter, I found great difficulty in securing uniformity of structure throughout the tubes owing to the fact that the pasty matter is forced through a series of passages leading to the "former" by the pressure of a single piston. The trouble with this process resides in the circumstance that if one of the passages becomes clogged in any way the feeding through that passage will be completely or partially obstructed, and consequently the tube on that side will lack material and be thinner than the rest of the tube. In some cases when such obstruction arises the excess in the speed of feeding on the unobstructed sides will cause the tubular structure to be bent to one side and will result in the breaking of the tube. In order to meet the requirements of uniformity in the operation of an apparatus of this sort, I have constructed a mechanism in which the paste is fed to the former by a piston in each passage, and I find that it is easily possible by these means to produce a perfectly-uniform tube amply adequate to meet the very serious conditions which arise in the use of electric-lamp glowers. These conditions are probably more serious and exacting than those which

would apply to almost any other form of tubular structure; but the invention is applicable to any and all tubes made from pasty material. I have myself made use of the same sort of apparatus for producing tubes of talcite designed to constitute the heater-body in electrical heaters, such as are employed in this kind of lamp.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section of my improved press for forming tubes from pasty material. Fig. 2 is a bottom view of the body of the press. Fig. 3 is a bottom view of a disk constituting a part of the former of my apparatus, and Fig. 4 is a bottom view of a nut which holds the disk in place.

In the drawings, A is a cylinder having at its top a chamber *a*, large enough to admit the plunger B of the press, and also having in its lower half a series of vertical passages *b b*, designed to receive the pasty material. Below the plunger B depend individual pistons *c c*, which enter the passages *b b* and press upon the pasty matter inside the said passages. A button *d* is screwed to the bottom of the cylinder A at its center, and this button is adapted to constitute a core around which the tube of pasty material is formed. Coöperating with the said core is a disk *e*, having a central opening which surrounds the core *d* and is adjustable with relation to it, whereby it is made possible to bring the said core exactly into the center of the opening in the disk. For holding the said disk in position after adjustment I provide a nut *f*, with an internal screw-thread at the top which engages with a corresponding screw-thread on the lower end of the cylinder A. The adjustment of the disk *e* takes place after the nut *f* has been screwed nearly tight upon the lower end of the cylinder, after which the nut is firmly tightened. For making it still surer that the disk *e* shall not move after being properly adjusted, screws *g g* are passed through the lower end of the nut *f*. These screws bear against the lower sides of the disk *e* and assist materially in holding it to its work.

At the lower end of the cylinder A are grooves *h h*, which form a means of commu-

5 nication between the lower end of the pas-
 sages *b b* and the central opening in the disk
e. It is through these grooves that the pasty
 material passes from all the passages *b b* to
 10 the former, which is made up of the core *d* and
 the inner walls of the disk *e*. Thus it will
 be seen that there is a direct pressure from
 a separate piston upon the pasty matter in
 each one of the passages of my press, and it
 15 is made practically certain that the material
 will be fed evenly to the former. In certain
 cases it is advantageous to have the grooves
 leading to the former cut in the disk instead
 of in the cylinder, as in this way by the use
 20 of extra disks a variety of sizes and thick-
 ness of tubes can be pressed with the same
 press-body.

In the foregoing I have considered the re-
 quirements of a press for squirting tubes
 25 of uniform wall thicknesses and strength.
 Owing, however, to the peculiar construction
 of my press each small area of the cross-section
 of the tube is squirted practically independ-
 ent of the adjoining sections. If, therefore, it
 30 be desired to squirt tubes having the wall
 thicker at one part than another of the cross-
 section, it is merely necessary to design the
 press so that the cylinder or cylinders feed-
 ing to the thick portion of the wall may be
 proportionately larger in area than those that
 feed to the thin portion.

The idea of feeding separately to a plurality
 of sections of the completed tube can be ex-
 tended to presses for squirting ribbon, cres-
 35 cents, star forms, crosses, and other compli-
 cated cross-sections without wrinkles, tearing,
 or any of the troubles experienced with single-
 piston presses. A further interesting varia-
 tion is produced by making certain of the cyl-
 40 inders feed more rapidly than the others by giv-
 ing them a greater piston area or in other ways.
 In this way a predetermined and fixed irregu-
 larity of feed is secured. If now a tube of
 uniform wall thickness or other section be
 45 squirted with such a press, various shapes
 will be produced, depending on the greatness
 and arrangement of the irregularities. With
 such presses it is possible to squirt spiral

tubes and such as have ripples latitudinally
 at certain places and to do a variety of curi- 50
 ous and useful things not possible with other
 presses.

I claim as my invention—

1. In a press for forming tubes from pasty
 materials, a die composed of a central core or 55
 button, and a disk, having an opening sur-
 rounding the said core so as to leave an inter-
 mediate space, a nut holding the said disk in
 place and two or more screws pressing against
 the bottom of the said disk. 60

2. In a press for forming tubes from pasty
 material, a cylindrical body, having separate
 passages therein for containing pasty mate-
 rial, a core or button secured to the end of
 the said cylindrical body, and grooves or chan- 65
 nels leading thereto, a disk coöperating with
 the said core or button to constitute a die or
 "former," the said disk being provided with
 an opening surrounding the said core so as to
 leave an intermediate space, the lower end of 70
 the said cylindrical body being screw-thread-
 ed, a nut for holding the disk in place, in
 combination with additional devices, such as
 screws, for insuring the stability of the disk
 under pressure. 75

3. In a press for forming tubes from pasty
 material, a cylindrical body having an open-
 ing, a plunger within the said opening, a num-
 ber of pistons connected with the said plun- 80
 ger, and separate passages or cylinders in the
 lower part of the cylindrical body, the said
 passages communicating with grooves or
 channels on the lower end of the cylinder, in
 combination with a button or core secured to
 the lower end of the cylinder, a disk having 85
 an opening which surrounds the said button
 or core so as to leave an intermediate space,
 and suitable clamping devices for the said
 disk.

Signed by me at Hanover, Germany, this 90
 14th day of July, 1899.

HENRY NOEL POTTER.

Witnesses:

W. K. ANDERSON,
 KIRKE LATHROP.