

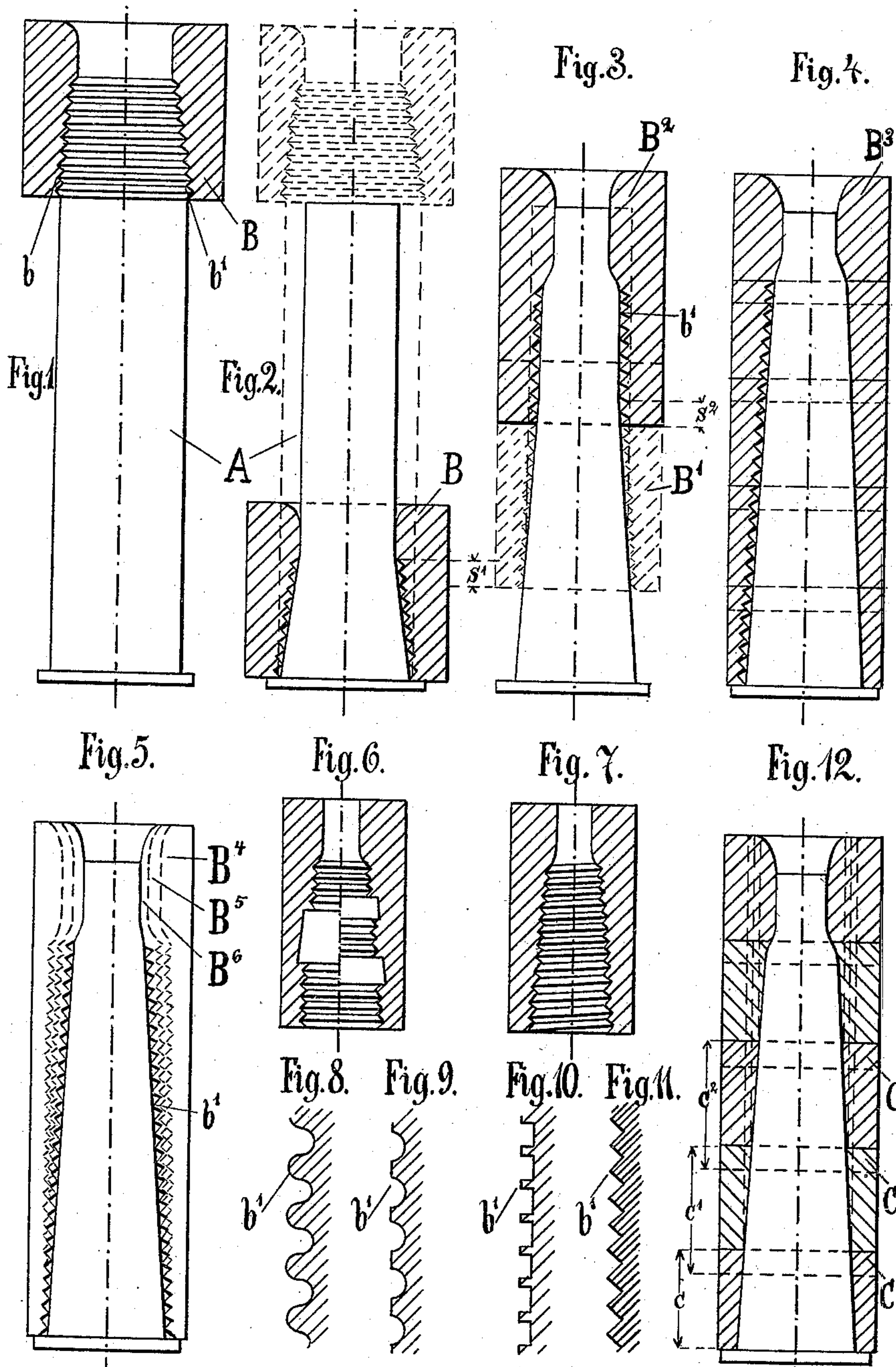
(No Model.)

W. LORENZ.

DIE FOR REDUCING TUBES.

No. 371,957.

Patented Oct. 25, 1887.



Witnesses:
H. F. Boyle
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UNITED STATES PATENT OFFICE.

WILHELM LORENZ, OF CARLSRUHE, BADEN, GERMANY.

DIE FOR REDUCING TUBES.

SPECIFICATION forming part of Letters Patent No. 371,957, dated October 25, 1887.

Application filed June 13, 1887. Serial No. 241,111. (No model.)

To all whom it may concern:

Be it known that I, WILHELM LORENZ, of Carlsruhe, Baden, in the Empire of Germany, have invented a certain new and useful Improvement Relating to Setting in or Contracting the Diameter of Cartridge-Cases or other Hollow Bodies, of which the following is a specification.

In the ordinary process for reducing tubular bodies, as cartridge-cases, to a smaller diameter, a friction corresponding to the surface of contact must be overcome and a corresponding power must be employed for pushing the die or matrix on the hollow body. The power required may become so great as to exceed the resisting force of the walls of the hollow body, producing thus an axial compression of the same before the radial compression could be effected. The present invention is intended to prevent such axial compression and to save power. There are employed matrices of shorter length for successive setting in the the case from distance to distance and of which the interior surfaces are interrupted by a greater or smaller quantity of annular or helicoidal grooves of any profile. Such matrices come in contact with the hollow body, which is to be set in only by the remaining internally-projecting collars or teeth.

I will describe the invention as applied to contracting the diameter of cartridge-cases.

I can work with pressing-rings of a broad or narrow contact-surface. When correctly conditioned, the friction between the matrix and the hollow body which is to be compressed and the power employed for overcoming this friction will be essentially diminished. For the setting in or contracting radially of hollow bodies of small caliber, as small cartridge-cases, the matrices may either be made the whole length of the body to be set in or portions of the length are successively set in by means of short matrices. This last method is preferable for cartridge-cases of considerable length, in order to reduce the contact-surfaces, and thereby to reduce the friction developed and the power required, and also to facilitate the making of the matrices and reduce their cost.

It will be understood that the cartridge-cases may be annealed between the successive treatments. There may also be employed

smooth matrices of shorter length, if the same in their contact-surfaces are so reduced that the friction produced by setting in a hollow body may not exceed the resisting force of the walls of the same, and that the hollow bodies by successive pushing on of such smooth pressing-rings on the relatively short distances of their length are on the desired smaller dimensions set in by-and-by in their whole length.

The accompanying drawings form a part of this specification. All are central longitudinal sections.

Figure 1 shows the first die in the act of commencing to act on a cartridge-case. Fig. 2 shows the same die after it has completed its action and is ready to be withdrawn. Fig. 3 shows a succeeding die acting on the same cartridge. Fig. 4 shows a set of matrices or pressing-rings applied in succession and forced down on the cartridge-case to different depths. The left side shows the interior ridged and grooved according to what I esteem the most complete form of my invention. Figs. 5 to 12, inclusive, represent modifications. Fig. 5 shows by dotted lines a succession of long dies bringing the cartridge gradually to the required contracted and tapered form by using each successively smaller than the last. All are formed with internal collars or teeth. Fig. 6 shows a matrix on which the projecting pressing-rings on some portions of the interior are cut off, in order to work with still less friction-surface. Figs. 8, 9, 10, and 11 are on a larger scale. They show variations in the form of cross-section of the annular or helicoidal collars. Fig. 12 corresponds to Fig. 4, but with the collars and grooves omitted, so that the acting surfaces are smooth. This figure also shows the extent to which I prefer to let the action of the several dies in Fig. 4 overlap one upon another.

Similar letters and marks of reference indicate corresponding parts in all the figures where they occur.

In these figures the tools for carrying out this method are adapted to be employed for cartridge-cases.

Fig. 1 shows a cylindrical case, A, which, by means of short matrices, is to be set in or contracted in diameter by portions at a time. First, a matrix, B, provided with grooves *b* and internally-projecting collars or ridges *b'*,

for setting in of the inferior portion of the case, as shown in Fig. 2, is pushed over the case (or the case into the matrix) till it reaches the bottom of the same. For setting
 5 in the case further at a higher point I use a correspondingly smaller die or matrix, B'. For setting in at the mouth I employ a matrix, B². The inner surface of each may have the collars or teeth b'. I have shown the
 10 interior of the mouth smooth. The setting in may, successively, be effected on shorter or larger portions, a greater or less number of matrices being employed. The front or largest part of the second matrix B' B² goes
 15 advantageously somewhat beyond the rear or smallest part of the preceding setting in, in order to equalize the action at all points and avoid showing a joint at the point of passing over of the same to the following setting in.

20 The contraction of the cartridge-case may finally be equalized and finished by means of a matrix, B⁶, of corresponding length, which matrix, also, is provided with collars or teeth b'.

Fig. 5 shows a series of long dies or mat-

rices, B⁴ B⁵ B⁶, also provided with collars or 25 teeth b', for setting in at once and in their whole length cases of small calibers, but all with the annular or helicoidal ridges.

Fig. 12 shows a number of matrices or pressing-rings, C C' C², &c., with smooth interior 30 walls, which successively are pushed on a case, and the single portions c c' c² set in, one after the other.

I claim as my invention—

The dies or matrices described for setting 35 in or contracting the diameter of cartridge-cases and other hollow bodies of which the interior walls present annular or helicoidal collars b', as herein specified.

In testimony whereof I have hereunto set my 40 hand at Berlin, this 24th day of November, 1886, in the presence of two subscribing witnesses.

WILHELM LORENZ.

Witnesses:

B. ROI,

C. GRONERT.