

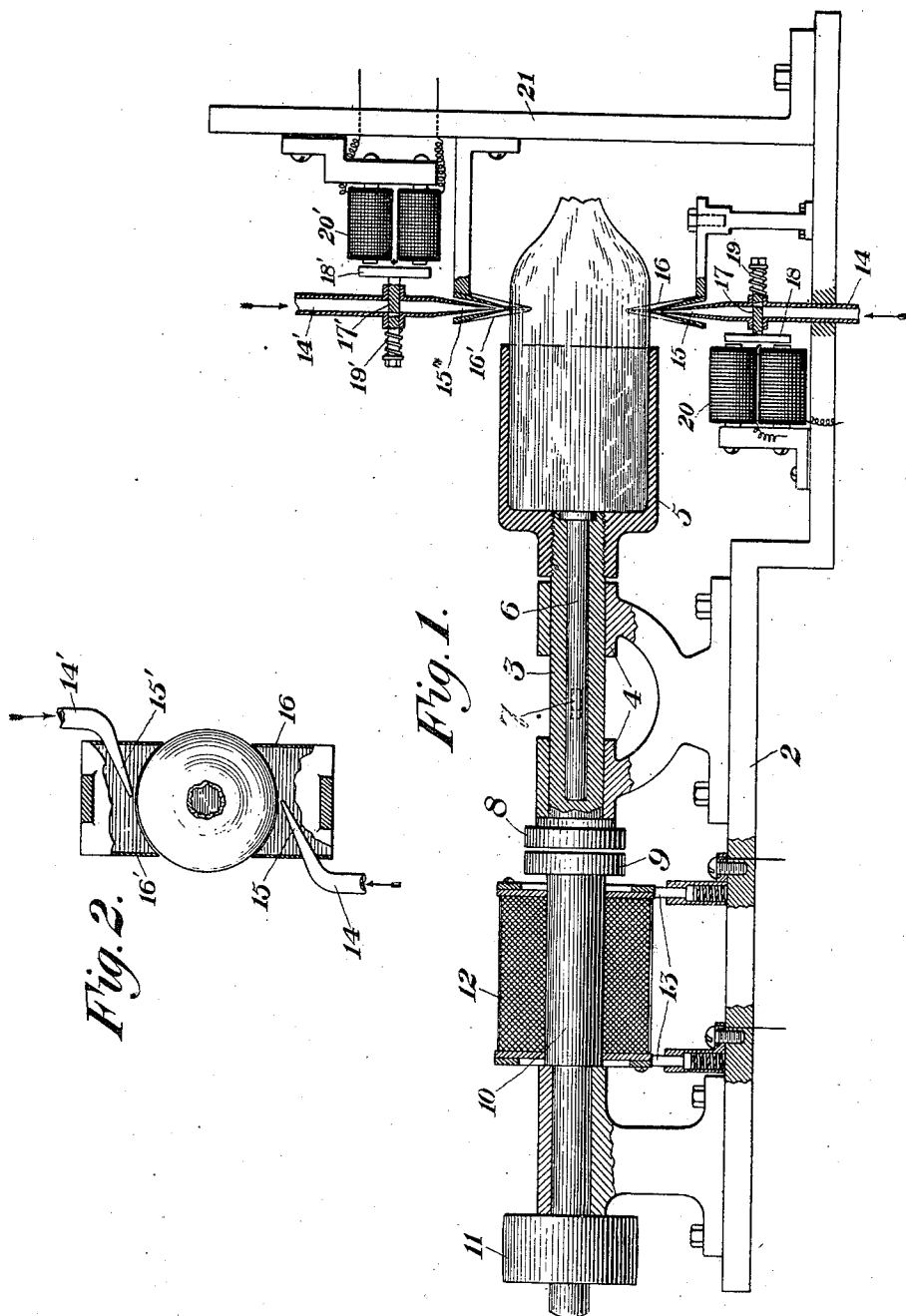
(No Model.)

F. WOODRUFF.

METHOD OF AND APPARATUS FOR CUTTING OFF GLASS ARTICLES.

No. 566,436.

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Witnesses
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UNITED STATES PATENT OFFICE.

FRANK WOODRUFF, OF ROCHESTER, PENNSYLVANIA.

METHOD OF AND APPARATUS FOR CUTTING OFF GLASS ARTICLES.

SPECIFICATION forming part of Letters Patent No. 566,436, dated August 25, 1896.

Application filed May 7, 1895. Serial No. 548,394. (No model.)

To all whom it may concern:

Be it known that I, FRANK WOODRUFF, of Rochester, in the county of Beaver and State of Pennsylvania, have invented a new and useful Improvement in Methods of and Apparatus for Cutting Off Glass Articles, of which the following is a full, clear and exact description.

My invention relates to an improved method of and apparatus for cracking or cutting off the waste end of a glass blank which has been blown into form. Heretofore this operation has been accomplished by placing the blank in a revolving chuck, wrapping a heated wire about the article at the point desired, and then suddenly cooling the glass by applying a cool fluid thereto. This method, however, is objectionable, as the wire leaves a film of oxid upon the glass, which must be entirely ground away, making the grinding operation a long and expensive one.

By my improved process the grinding is made much shorter and easier, thus cheapening the production as well as increasing the output.

In carrying out my method I place the blank in a rotating chuck and first apply a thin stream of highly-heated air or gas to the blank at the point where it is to be cracked off. I then shut off the hot air and apply a similar stream of cold air at the same point, whereupon the sudden contraction cracks off the glass neatly and uniformly.

I illustrate one form of apparatus for carrying out my method in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of my improved apparatus; and Fig. 2 is an end elevation of the hot and cold air applying devices, partly broken away.

In the drawings, 2 represents a suitable base-plate, having a rotary spindle 3, supported in bearings 4 thereon. This spindle carries a chuck 5 and is hollow, an ejector 6 being supported within it, the ejector having a lug projecting through a side slot 7 in the spindle, as indicated in dotted lines in Fig. 1, so that by striking the lug the blank may be driven from the chuck. The spindle terminates in a disk 8, in close proximity to a similar disk 9, carried upon a rotary core 10,

having a driving-pulley 11. The core 10 is located within an electromagnet 12, having spring-pressed current-supplying brushes 13, and, the core being rotated by the pulley, it is evident that when the current is applied the core is magnetized and drawing the disk 8 to it rotates the chuck. This device acts merely as a clutch, and it is evident that any other convenient clutch may be substituted therefor, if desired. Below the blank which is carried in the chuck is located a hot-air pipe 14, terminating in an injector-nozzle 15, which is not directed radially toward the article, but is at an angle thereto and more nearly tangential, as shown in Fig. 2. Surrounding the injector, and extending partially around the blank, is a tapering sheath 16, having a thin slot through which the air passes to the glass in a very shallow sheet, thus impinging upon it along a narrow line, which becomes thereby heated and expanded.

In the pipe 14 is a sliding transverse valve 17, having at one end an armature 18, while the other is surrounded by a coiled spring 19, which normally holds the valve closed or out of register with the pipe, as shown in Fig. 1.

The armature is attracted by the cores of an electromagnet 20 whenever the same becomes energized, thus opening the valve against the pressure of the spring.

Above the chuck and upon a standard 21 is supported an exactly similar device for applying the cold air, which is designated by the same numerals, distinguished by the prime mark. I prefer to place the standard 21 at one side of the chuck at right angles to the position shown to give easy admission of the blank to the chuck.

Three switches or push-buttons are employed for cutting on or off the current to the three magnets, and the action is apparent from the above description, a quick jet of heated air being first applied and then a similar jet of cold air. The air may be heated by passing the pipe through a furnace or in any suitable manner. By applying the air at an angle to the surface of the article a more even crack is made in the glass than is possible where the jet of air or gas is directed normally to the surface, but my broad process may be operated merely by the succes-

sive use of a jet of hot air or gas and a jet of cold air or gas, which are directed normally to the surface, since, while this does not give as good results as where the jet is directed at an angle, it still can be used and is preferable to former methods for obtaining this result.

I am aware that it has been attempted to use a flame to heat the glass, but this has proved impracticable, as the flame cannot be brought to a fine point, but spreads over the glass and makes the cracking very uneven.

Many changes in the apparatus employed may be made by the skilled mechanic without departure from my invention, since I consider myself the first to employ a jet of heated air or gas, followed by a similar jet of cold air, to crack off a glass article.

I claim—

1. The method of cutting or cracking off glass articles, which consists in applying along the line where the glass is to be cracked a thin jet of heated air or gas, and then applying a similar jet of cold air or gas along the same line; substantially as described.

2. The method of cutting or cracking off glass articles, which consists in applying tangentially thereto a thin jet of heated air or gas at the line where the glass is to be cracked, and then applying a similar jet of

cold air or gas along the same line; substantially as described.

3. In apparatus for cutting glass, a revolving chuck adapted to hold and rotate the glass article, a valved hot-air injector, and a valved cold-air injector, each arranged to direct a current of air or gas upon the article at the point where it is to be severed in a thin jet at an angle to the surface of the glass; substantially as described.

4. The method of cutting or cracking off glass articles consisting in applying thereto a jet of heated air or gas at an angle to the surface of the glass, and then applying a jet of cold air or gas at an angle to the heated portion; substantially as described.

5. In apparatus for cutting glass, a revolving chuck, a valved hot-air injector, and a valved cold-air injector, each arranged to direct a current of air or gas upon the article, in combination with electromagnets arranged to operate the valves; substantially as described.

In testimony whereof I have hereunto set my hand.

FRANK WOODRUFF.

Witnesses:

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