

(No Model.)

J. D. SWINDELL.
DRAW DIE.

No. 575,078.

Patented Jan. 12, 1897.

FIG. 1.

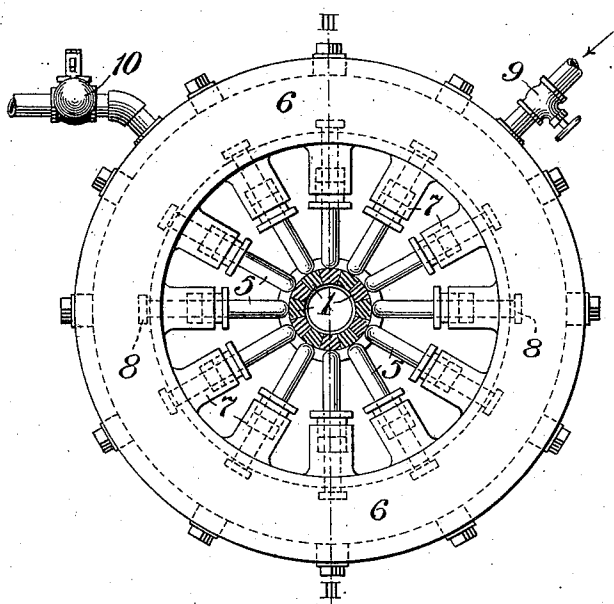


FIG. 3.

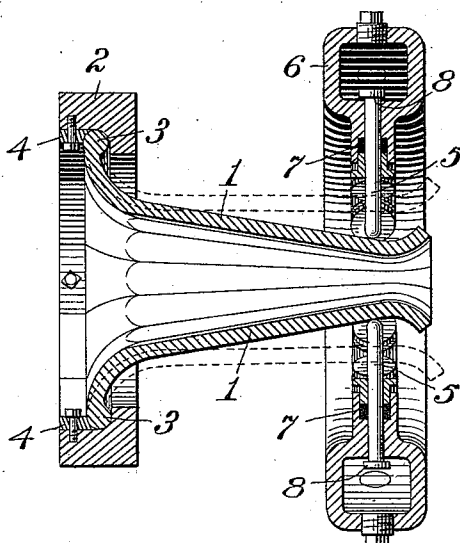


FIG. 2.

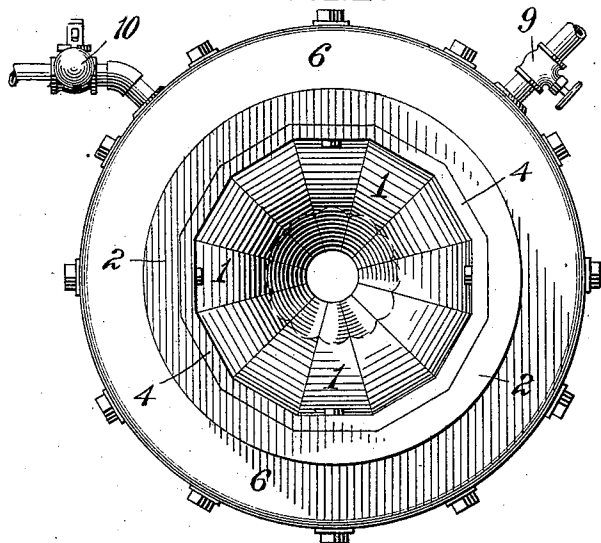


FIG. 4.

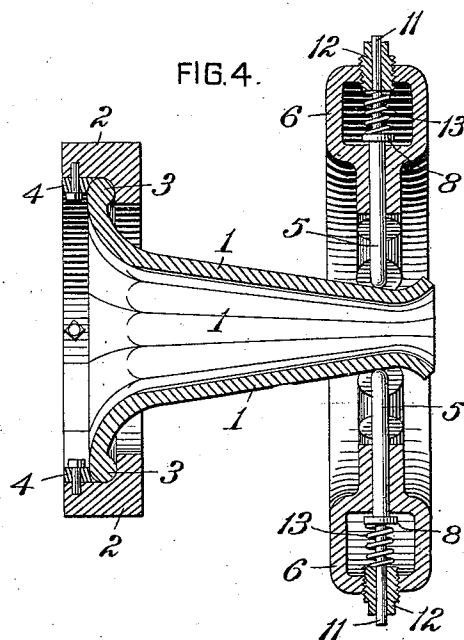
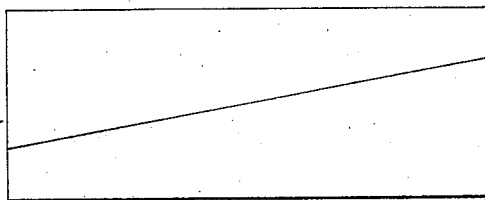


FIG. 5.



WITNESSES:

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Att'y.

UNITED STATES PATENT OFFICE.

JAMES D. SWINDELL, OF ALLEGHENY, PENNSYLVANIA.

DRAW-DIE.

SPECIFICATION forming part of Letters Patent No. 575,078, dated January 12, 1897.

Application filed November 9, 1895. Serial No. 568,412. (No model.)

To all whom it may concern:

Be it known that I, JAMES D. SWINDELL, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Draw-Dies, of which improvements the following is a specification.

The invention described herein relates to certain improvements in dies for the manufacture of taper pipes, and has for its object the employment of a sectional die adapted to be expanded by the article operated on in accordance with the increase of pressure exerted on the walls of the die due to the increasing diameter of the pipe.

The invention is hereinafter more fully and particularly described and claimed.

In the accompanying drawings, forming a part of this specification, Figures 1 and 2 are front and rear elevations, respectively, of my improved die or former. Fig. 3 is a sectional elevation of the same, the plane of section being indicated by the line III III, Fig. 1. Fig. 4 is a similar view illustrating a modification in the means for holding the die-sections as against outward movement; and Fig. 5 is a plan view illustrating the manner of cutting a sheet to form blanks for taper tubes, &c.

The die consists of a series of plates 1, having concave inner faces formed on arcs of circles of gradually-increasing radii and of a gradually-increasing width from end to end. These plates, when arranged in the annular block 2, form a hollow truncated cone. The rear ends of the plates are curved or flared outwardly and are provided with a circular head or knuckle 3, adapted to fit in a correspondingly-shaped groove or recess in the inner wall of the block 2. The knuckles are held in position by means of the ring 4, which is bolted to the annular block. The plates are yieldingly held in operative position by means of pins 5, which are mounted in an annular frame 6, so that the inner ends bear upon the plates at points adjacent to the free ends thereof. In the construction shown in Figs. 1, 2, and 3 the annular frame 6 is made hollow, and the outer ends of the pins project through stuffing-boxes 7 into the chamber of said frame. The ends of the pins within the chamber are provided with enlarged heads 8,

so as to be effectively operated on by fluid-pressure, which is admitted to the chamber through the valved pipe 9. The escape of fluid from the chamber is controlled by a weighted or spring valve 10, so that a gradual outward movement of the sectional plates is permitted whenever the pressure against the plates exceeds a certain predetermined amount.

In lieu of a regulated fluid-pressure for controlling the movement of the plates other suitable means may be employed for that purpose, as, for example, the construction illustrated in Fig. 4 shows the pins 5 provided with stems 11, projecting out through hollow plugs 12, which are threaded externally, so that they may be turned in or out, thereby regulating the tension of springs 13, surrounding the stems and bearing at their ends against the plugs and the heads of the pins 5. In using this construction the springs are adjusted to a uniform tension by turning the threaded plugs so that a pressure exerted by them on plates will be uniform on all sides of the blank being welded.

In manufacturing tapering pipe a metal strip having a width equal or approximately equal to the circumferences of the pipe at its ends is divided longitudinally on a diagonal line, as shown in Fig. 5. The tapering blanks or skelps thus formed are properly heated and then drawn through the die, the small end foremost. The pressure on the pins is regulated either by adjusting the valve 10 or the tension of the springs 13, so as to bend the blank or skelp transversely and to press its edges together with sufficient force to effect a welding thereof. As the larger portions of the blank or skelp are drawn into the die the plates are forced outwardly, maintaining the same welding-pressure on the skelp. After a tube has been welded the valve in the pipe 9 is opened, so as to admit fluid-pressure to the chamber in the annular frame 6, whereby the pins are forced inwardly, causing the plates to resume a closed position. In the construction shown in Fig. 4 the springs will force the pins and plates in as soon as the tube has been drawn from between the latter.

The anchor-block 2, which serves to hold the plates as against movement with the blank or skelp, thereby relieving the pins as against

transverse strains, is preferably formed independent of the frame carrying the pins, but the pins may be made sufficiently heavy to resist the transverse strains. In such a construction the anchor-block may be omitted, as the pins will shift and hold the plates.

I claim herein as my invention—

1. A die for welding pipe having in combination an annular block, a series of plates pivotally connected to the block, a like series of pins bearing against the plates and means for holding the pins yieldingly as against outward movement, substantially as set forth.

2. A die for welding pipe having in combination a series of movable plates, a hollow

annular frame surrounding the plates, a series of pins mounted in the frame, their inner ends bearing against the plates and their outer ends within the frame being provided with heads, a pipe for introducing fluid-pressure into the frame, and an escape-pipe provided with a regulating-valve, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JAMES D. SWINDELL.

Witnesses:

DARWIN S. WOLCOTT,
F. E. GAITHER.