

J. STRATTON & E. A. CLAREMONT.

WIRE DRAWING APPARATUS.

APPLICATION FILED JAN. 4, 1910.

1,015,914.

Patented Jan. 30, 1912.

Fig. 1.

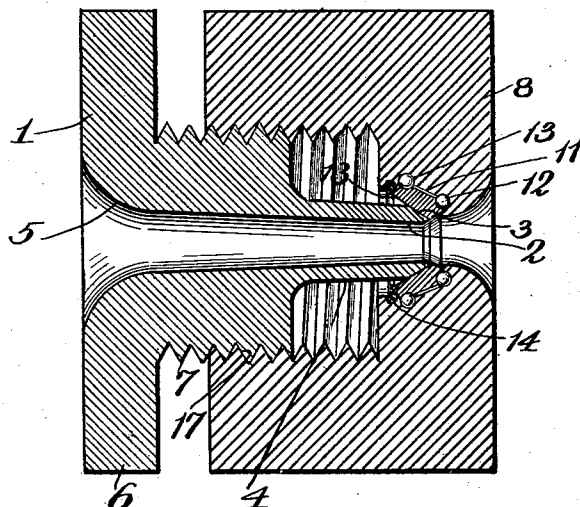
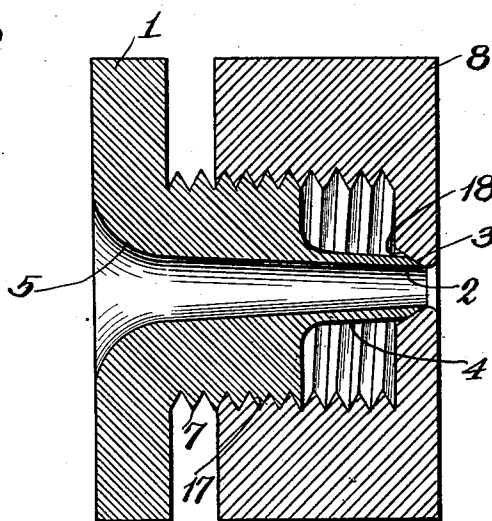


Fig. 2.



WITNESSES

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JOHN STRATTON, OF ALTRINCHAM, AND ERNEST ALEXANDER CLAREMONT, OF OLD TRAFFORD, MANCHESTER, ENGLAND.

WIRE-DRAWING APPARATUS.

1,015,914.

Specification of Letters Patent.

Patented Jan. 30, 1912.

Application filed January 4, 1910. Serial No. 536,431.

To all whom it may concern:

Be it known that we, JOHN STRATTON and ERNEST ALEXANDER CLAREMONT, subjects of the King of Great Britain, and residing, respectively, at Altrincham, county of Chester, and at Old Trafford, Manchester, county of Lancaster, England, have made certain new and useful Inventions Relating to Wire-Drawing Apparatus, of which the following is a specification.

This invention relates to wire drawing apparatus in which a yieldable die of steel or other suitable material is forced into a cooperating compressing funnel to wedge or force it inward and thereby contract the die throat in the same general manner as described in our United States Patent No. 931,971, of August 24, 1909; and this invention relates especially to such wire drawing apparatus in which the die is preferably formed integral with one of the holder members such as the plug and given a reduced substantially uniform cross-section preferably adjacent its discharge end for cooperation with the compressing funnel to be successively compressed thereby, the rear end of the die being in this way securely held in alinement during the compressing operation.

In the accompanying drawings showing in a somewhat diagrammatic way several illustrative embodiments of this invention, Figure 1 is a longitudinal section of one form of apparatus; and Fig. 2 is a similar sectional view of a modification.

In this apparatus the compound die may comprise two die members, one of which may be formed with a suitable aperture or compressing funnel with which the die end or portion adjacent the die throat may cooperate. The cooperating die members may be provided with a connection of any desired description, such for example as a screw connection to powerfully force the die into the compressing funnel to the desired extent to correspondingly locally compress the die and reduce the gage of its throat. For instance, in the illustrative embodiment of the invention shown in Fig. 1, the die member or plug 1 may be formed with the integral die 4, preferably having a reduced substantially uniform section portion for cooperation with the compressing funnel and which may if desired be located adjacent the die end. This die

member may as indicated be formed with a gradually contracting aperture there-through leading from the mouth 5 to the throat 2 which as indicated is substantially at the discharge end or point of the die which may be given a conical taper, preferably of such slope as to prevent the development of excessive frictional engagement between the die and compressing funnel when there is relative rotating movement between them. As is indicated in the drawing the outside of this reduced section die point is slightly tapered so as to be substantially parallel with the internal aperture leading to the die throat, thus forming a reduced section die point of considerable length which has a substantially uniform cross-sectional area of metal. It is not, however, necessary in all cases that there should be a relative rotation between the compressing funnel and die even when the two cooperating die members have a screw connection between them which may be of any desired character, such for example as by forming the plug 1 with an external thread 7 cooperating with the internal thread 17 in the other die member or cap 8. For example, the compressing funnel may be formed on a separate funnel member rotatably mounted in any desired way in the cap as by providing one or more series of anti-friction balls, such as 12, 13 between the cap and the funnel member 11 on which the compressing funnel 18 is formed. It is of course desirable to have the funnel member made of sufficient size and strength to give the desired rigidity to the compressing funnel, this funnel member being if desired permanently retained in position by a suitable retainer which may be in the form of the spring retainer ring 14 which may be sprung in behind the funnel member after it has been inserted from the rear of the cap. With this arrangement when the plug 1 and connected die 4 are rotated as by the polygonal nut 6 formed on the plug the end of the die when forced into engagement with the compressing funnel 18 tends to rotate the funnel member with it. Torsional strains on the die are thus minimized during the compressing operation and the rear end of the die is effectively held in alinement by its engagement with the threaded portion of the cap.

It is not, however, necessary in all cases to prevent relative rotation between the die and compressing funnel provided the section of the die undergoing compression is sufficiently reduced and the area in engagement with the compressing funnel sufficiently small due to the funnel having a considerable inclination or short taper, so that the inward wedging or local compression of the die takes place without undesirable distortion due to torsional strain thereon. It is of course desirable in order to promote the uninterrupted readjustment or regaging of the die by its successive local compression to form the die with a substantially uniform reduced section portion which may be located adjacent its discharge end. As indicated in Fig. 2 the die 4 may be integral with or otherwise permanently secured to the plug 5 and may have a substantially uniform reduced section of the proper length to secure reliable operation with the die material and thickness of wall selected. The throat 2 of the die may in this instance be formed adjacent its discharge end or point 3 which may be given a conical form so as to cooperate properly with the short taper compressing funnel 18. Also to promote effective readjustment this reduced section portion which is preferably nearly cylindrical, that is, having the approximately equally slightly tapered outer and inner surfaces shown should be made as light as consistent with the degree of strength and rigidity required during the drawing operation which also facilitates its regaging. Reference is hereby made to our copending application 536,430, filed January 4, 1910, in which are claimed some of the broader features of the herein disclosed inventions relating to the cylindrical or otherwise reduced section die point and means to successively locally compress the same in a cooperating compressing funnel and regage the die throat.

Having described this invention in connection with a number of illustrative embodiments, forms, proportions and arrangements of parts, to the details of which disclosure the invention is not of course to be limited, what is claimed as new and what is desired to be secured by Letters Patent is set forth in the appended claims.

1. In wire drawing apparatus, a compound die comprising a plug formed with an integral reduced section die of substantially uniform effective area adjacent its discharge end, a cap provided with a funnel member formed with a compressing funnel and having a screw connection with the rear portion of said plug to hold said die in alinement with said compressing funnel and anti-friction members on which said funnel member is mounted to allow relative rotation between said funnel member and said

cap as said die is forced into said compressing funnel during the compressing movement of said die members.

2. In wire drawing apparatus, a compound die comprising a plug formed with an integral reduced section die adjacent its discharge end, a cap provided with a funnel member formed with a compressing funnel and having a screw connection with said plug adjacent its rear end to maintain said die in alinement with said compressing funnel, said funnel being rotatably mounted in said cap to allow the relative rotation between them as said die is forced into said compressing funnel during the compressing movement of the die members.

3. In wire drawing apparatus, a compound die comprising a plug formed with a reduced section die adjacent its discharge end, a cap provided with a relatively movable funnel member formed with a compressing funnel to minimize relative rotation between said die and funnel during the compressing operation, said cap having a screw connection with said plug adjacent its rear end to hold said die in alinement with said compressing funnel.

4. In wire drawing apparatus, a compound die comprising a plug formed with a die having a reduced yieldable section adjacent the die throat and a relatively rotating cap, said cap and plug being provided with engaging means whereby on their relative rotation they will be given a relative axial adjustment, said cap being provided with a funnel member rotatably mounted with respect thereto to minimize relative rotation between said die and funnel during the compressing operation and formed with a compressing funnel cooperating with said reduced die section to locally compress the same.

5. In wire drawing apparatus, a compound die comprising a pair of cooperating relatively rotating die members, said die members being provided with engaging means whereby on their relative rotation they will be given relative axial adjustment, one of said die members being provided with a compressing funnel, the cooperating die member being formed with an integral substantially uniform reduced section die adjacent its discharge end and cooperating with said funnel to be locally compressed thereby and means to minimize relative rotation between said die and funnel during the compressing operation.

6. In wire drawing apparatus, a compound die comprising a pair of cooperating relatively rotating die members, said die members being provided with engaging means whereby on their relative rotation they will be given relative axial adjustment, one of said die members being formed with a short taper compressing funnel and the

other of said die members being formed with a substantially uniform reduced section portion coöperating with said compressing funnel to be successively locally compressed thereby and contract the corresponding die throat and means to effect the compressing movement of the die members and compress said reduced section portion without undesirable rotation between said die and funnel.

7. In wire drawing apparatus, a compound die comprising a pair of coöperating relatively rotating die members, said die members being provided with engaging means whereby on their relative rotation they will be given relative axial adjustment, one of said die members being provided with a short taper compressing funnel and the other of said die members being formed with an integral reduced section die coöperating with said funnel to be locally compressed thereby and means to effect the compressing movement of the die members and locally compress said reduced section die without substantial relative rotation between said die and compressing funnel.

8. In wire drawing apparatus, a compound die comprising a pair of coöperating die members, one of said die members being provided with a short taper compressing funnel and the other of said die members being formed with an integral substantially uniform reduced section die adjacent its discharge end and coöperating with said compressing funnel, said coöperating die members having means rigidly incorporated therewith to cause a compressing movement between and successively locally compress said reduced section die adjacent its discharge end.

9. In wire drawing apparatus, a compound die comprising a pair of coöperating die members, one of said die members being provided with a compressing funnel and the other of said die members being provided with a rigid substantially uniform reduced section die portion coöperating with said compressing funnel and means forming part of said coöperating die members to cause a compressing movement between them and successively locally compress said reduced section die adjacent its discharge end.

10. In wire drawing apparatus, a compound die comprising a pair of coöperating die members, one of said die members being provided with a compressing funnel and the other of said die members being provided with a rigid reduced section die portion coöperating with said compressing funnel and means forming part of said coöperating die members to cause a relative compressing movement between them and correspond-

ingly compress said reduced section die and contract and regage the die throat.

11. In wire drawing apparatus, a compound die consisting essentially of a pair of coöperating die members, one of said die members comprising a short taper compressing funnel and the other of said die members being formed with an integral substantially uniform reduced section portion coöperating with said compressing funnel said coöperating die members having means rigidly incorporated therewith to cause a relative compressing movement between said coöperating die members and correspondingly successively locally compress said reduced section portion and correspondingly contract the die throat.

12. In wire drawing apparatus, a compound die comprising a pair of coöperating die members having a screw connection, one of said die members being provided with a compressing funnel and the other of said die members being formed with a substantially uniform reduced section die coöperating with said compressing funnel and means to cause a relative compressing movement between said coöperating die members and correspondingly successively locally compress said reduced section die and contract the die throat.

13. In wire drawing apparatus, a compound die comprising a pair of coöperating die members, one of said die members being provided with a short taper compressing funnel and the other of said die members being formed with an integral substantially uniform reduced section die provided with a tapered die point adjacent its discharge end for coöperation with said compressing funnel and an alining connection between said die members to hold said die in alinement with said compressing funnel.

14. In wire drawing apparatus, a compound die comprising a pair of coöperating die members, one of said die members being provided with a compressing funnel and the other of said die members being provided with a reduced section die coöperating with said compressing funnel, means to cause a relative compressing movement between said coöperating die members and correspondingly compress said reduced section die and contract the die throat, the die members being held in alinement by means at a point remote from said compressing funnel.

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