

Nov. 19, 1940.

W. R. FORD ET AL

2,222,505

SIZING DIE FOR TWISTERS

Filed July 1, 1940

2 Sheets-Sheet 1

Fig. 1.

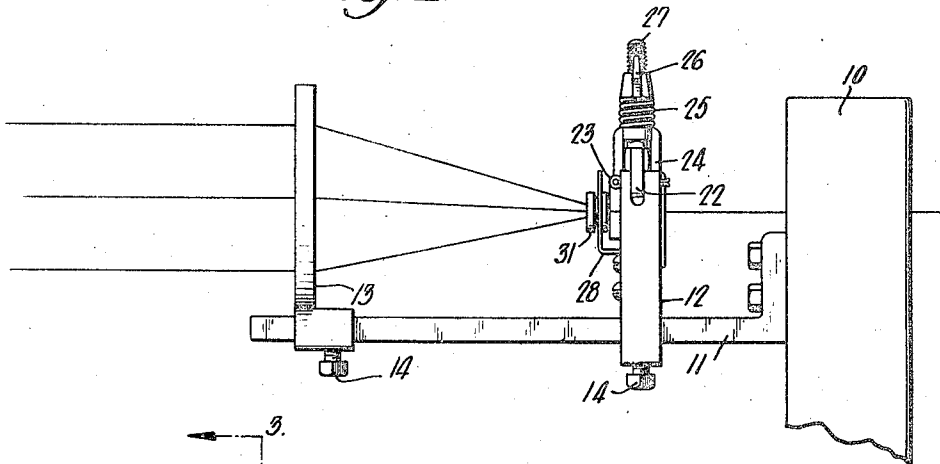


Fig. 2.

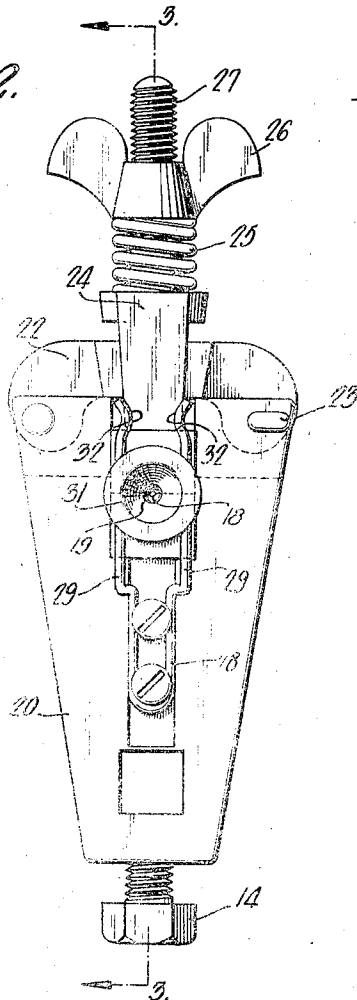
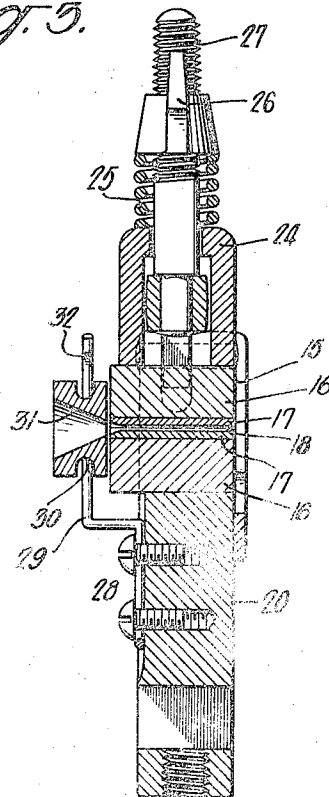


Fig. 5.



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Fig. 4.

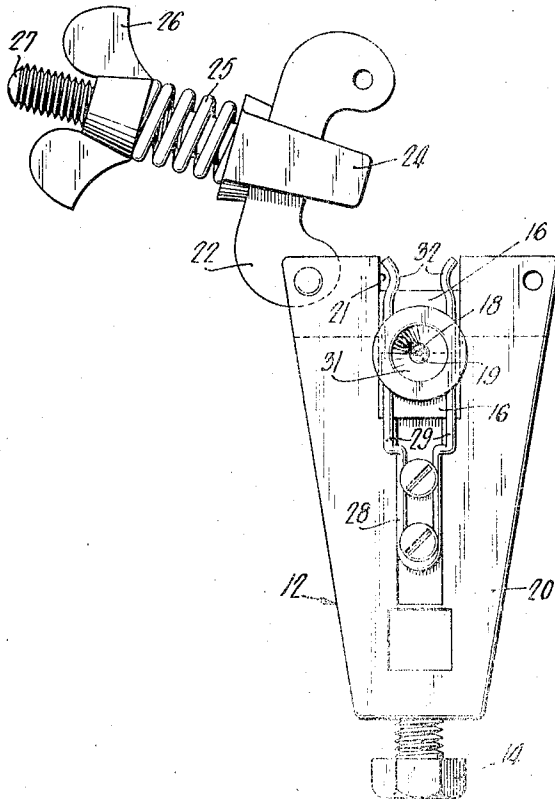


Fig. 5.

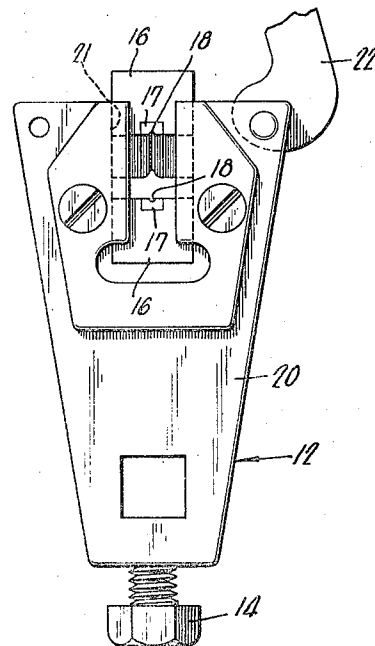


Fig. 6.

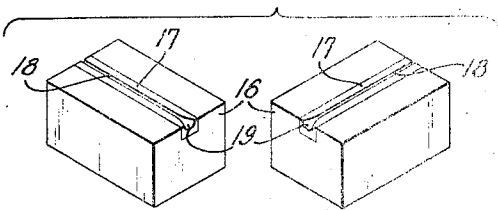
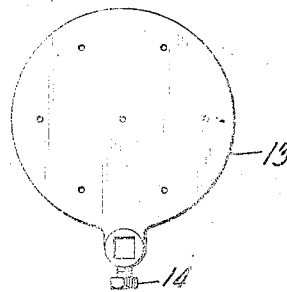


Fig. 7.



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UNITED STATES PATENT OFFICE

2,222,505

SIZING DIE FOR TWISTERS

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Application July 1, 1940, Serial No. 343,486

10 Claims. (Cl. 57—138)

This invention relates to sizing dies for twist-
ers and, more particularly, to the dies employed
in compacting and uniformly sizing a plurality
of ends which are to be subsequently twisted to
form a thread.

Commercial twisting machines employed in
the manufacture of finer threads operate at very
high speeds, and since the ends are guided
through a stationary guide to the die, these ends
all tend, during any particular operation, to oc-
cupy the same position in the die. These dies,
as usually produced, are formed in two sections
at the junction of which the sizing opening is
formed, one of the sections being provided with
a fixed funnel mouth for guiding the ends into
the die opening per se. Due to the fact that
the ends tend to assume a fixed position in oper-
ation, the mouths of the dies become rapidly
worn, necessitating their replacement, and in
the case of the ordinary construction, replace-
ment of the entire die. This, due to the fact
that the dies which must be accurately formed
are high priced, results in an increased price
in the thread, and this increase in price results
not only from the actual cost of the replaced
dies but from the fact that their short life ren-
ders frequent replacements necessary. Addition-
ally, since the threads tend to cut into the
funnel mouth and thus form sharp edged
grooves, the destruction of the funnel mouth
results in frequent breakage of the ends at their
passage through the mouth.

An important object of the present invention
is the provision in a structure of this character
of a die so formed that it is not subject to the
rapid destruction met with in the usual type of
die and, more specifically, to an arrangement
such that the funnel mouth lasts longer than
the ordinary die but is, upon failure, replaceable
with a minimum loss of time and without re-
placement of the die per se.

Another object of the invention is the forma-
tion of such dies so that the die may be readily
produced with a hardened insert in which the
forming opening is arranged, thereby again
materially reducing the cost of production
thereof.

These and other objects we attain by the con-
struction shown in the accompanying drawings
wherein, for the purpose of illustration, we have
shown a preferred embodiment of our inven-
tion and wherein:

Fig. 1 is a fragmentary side elevation of a
twister embodying a sizing die constructed in
accordance with our invention;

Fig. 2 is a front elevation of the die support;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a view similar to that of Fig. 2 but
showing the cap of the die holder swung back
to permit removal and replacement of the die;

Fig. 5 is a rear elevation of the die holder
showing one of the die sections in the process
of removal;

Fig. 6 is a combined perspective of the sections
of the die proper; and

Fig. 7 is a front elevation of the guiding or
"geometric" plate.

Referring now more particularly to the draw-
ings, the numeral 10 generally designates a
portion of the frame of a twisting machine, the
twisting mechanism per se being omitted since
it forms no part of the present invention. Se-
cured to the frame 10 is a bracket 11 mounting
a die support 12 and a geometric or guide plate
13, these elements being adjustable along the
bracket and clampable thereon by means of set
screws 14 or the like. Within the holder is ad-
justably supported a sizing die 15 which is illus-
trated as formed in two sections 16 having a
hardened central core 17 in which the die open-
ing 18 is formed. We have determined that this
core is best formed from materials having the
characteristics of tantalum carbide. As illus-
trated, one end of this opening is slightly en-
larged as at 19 to provide a guide for the con-
verging ends entering the die opening, and the
core is of sufficient size that the guide enlarge-
ment 19 may be entirely formed therein.

The holder comprises a main body 20 having
guideways 21 in which the die sections are ver-
tically movable and through the upper end of
which they may be displaced for replacement
by repair dies or dies of other sizes. A cap 22
is hinged to the support body at one side of the
upper end thereof and may be secured in posi-
tion at the opposite side thereof through a re-
movable pin 23. This cap embodies a spring-
pressed yoke 24 adapted to bear upon the upper
die section and having associated therewith a
spring 25, the pressure of which may be regu-
lated through a thumb screw 26 on a stud 27,
the lower end of which is secured centrally of
the cap.

Secured to the holder body 20 is a U-shaped
spring 28, the arms 29 of which are offset from
the front face of the body, as more clearly
shown in Figure 3, and provide guides engag-
ing in a peripheral groove 30 formed in the fun-
nel mouth 31. The arms 29 loosely engage in

the groove so that this funnel mouth is free to move vertically, or to rotate as the case may be. The upper ends of the arms are provided with inwardly off-set portions 32 which will prevent accidental displacement of the funnel mouth but which may readily spread apart to permit either removal or replacement thereof. While in the present instance these arms are merely shown as identical spring arms, it will be obvious that the same mounting may be obtained by making either arm solid and the other thereof yieldable.

It will be obvious that with a structure of this type replacement of either the die itself or of the funnel mouth may be effected very rapidly.

Additionally, the construction of the funnel mouth as a separate unit enables economic formation of the die per se, aside from the fact that in this arrangement the destruction of the funnel mouth itself has no effect on the die.

Since the construction illustrated is capable of considerable modification without departing from the spirit of our invention, we do not wish to be understood as limiting ourselves thereto except as hereinafter claimed.

We claim:

1. A guide for twistlers comprising a sizing die adapted to receive and compactly form a plurality of ends in preparation to twisting them in the form of a thread, a stationary guide having openings uniformly spaced about a given axis aligned with the die opening for guiding said ends, and a rotatable and vertically movable funnel mouth disposed adjacent to and converging the ends for entrance into the mouth of said die.

2. A guide for twistlers comprising a sizing die adapted to receive and compactly form a plurality of ends in preparation to twisting them in the form of a thread, a stationary guide having openings uniformly spaced about a given axis aligned with the die opening for guiding said ends, a rotatable and vertically movable funnel mouth disposed adjacent to and converging the ends for entrance into the mouth of said die, and guiding means for said funnel mouth including a yieldable element yielding of which permits removal or replacement of said funnel mouth.

3. A guide for twistlers comprising a sizing die adapted to receive and compactly form a plurality of ends in preparation to twisting them in the form of a thread, said die comprising a pair of similar sections each having a hardened insert in which one-half of the sizing opening is formed, means to hold said sections in assembled relation, a stationary guide having openings uniformly spaced about a given axis aligned with the die opening for guiding said ends, and a rotatable and vertically movable funnel mouth disposed adjacent to and converging the ends for entrance into the mouth of said die.

4. A guide for twistlers comprising a sizing die adapted to receive and compactly form a plurality of ends in preparation to twisting them in the form of a thread, said die comprising a pair of similar sections each having a hardened insert in which one-half of the sizing opening is formed, means to hold said sections in assembled relation, a stationary guide having openings uniformly spaced about a given axis aligned with the die opening for guiding said ends, a rotatable and vertically movable funnel mouth disposed adjacent to and converging the ends for entrance into the mouth of said die, and guiding means for said funnel mouth including a yield-

able element yielding of which permits removal or replacement of said funnel mouth.

5. A guide for twistlers comprising a sizing die adapted to receive and compactly form a plurality of ends in preparation to twisting them in the form of a thread, a stationary guide having openings uniformly spaced about a given axis aligned with the die opening for guiding said ends, a rotatable and vertically movable funnel mouth disposed adjacent to and converging the ends for entrance into the mouth of said die, a ring in which said funnel mouth is formed, said ring having an annular groove, and a pair of vertically extending arms carried by the support and loosely and yieldably engaged in the groove of said ring at opposite sides of the ring.

6. A guide for twistlers comprising a sizing die adapted to receive and compactly form a plurality of ends in preparation to twisting them in the form of a thread, said die comprising a pair of similar sections each having a hardened insert in which one-half of the sizing opening is formed, means to hold said sections in assembled relation, a stationary guide having openings uniformly spaced about a given axis aligned with the die opening for guiding said ends, a rotatable and vertically movable funnel mouth disposed adjacent to and converging the ends for entrance into the mouth of said die, a ring in which said funnel mouth is formed, said ring having an annular groove, and a pair of vertically extending arms carried by the support and loosely and yieldably engaged in the groove of said ring at opposite sides of the ring.

7. A guide for twistlers comprising a sizing die adapted to receive and compactly form a plurality of ends in preparation to twisting them in the form of a thread, a stationary guide having openings uniformly spaced about a given axis aligned with the die opening for guiding said ends, a rotatable and vertically movable funnel mouth disposed adjacent to and converging the ends for entrance into the mouth of said die, a ring in which said funnel mouth is formed, said ring having an annular groove, and a pair of vertically extending arms carried by the support and loosely and yieldably engaged in the groove of said ring at opposite sides of the ring, said arms being formed of resilient material and anchored at their lower ends, the upper ends of the arms having inset portions spaced apart a distance less than the diameter of the ring at the base of the groove.

8. A guide for twistlers comprising a sizing die adapted to receive and compactly form a plurality of ends in preparation to twisting them in the form of a thread, said die comprising a pair of similar sections each having a hardened insert in which one-half of the sizing opening is formed, means to hold said sections in assembled relation, a stationary guide having openings uniformly spaced about a given axis aligned with the die opening for guiding said ends, a rotatable and vertically movable funnel mouth disposed adjacent to and converging the ends for entrance into the mouth of said die, a ring in which said funnel mouth is formed, said ring having an annular groove, and a pair of vertically extending arms carried by the support and loosely and yieldably engaged in the groove of said ring at opposite sides of the ring, said arms being formed of resilient material and anchored at their lower ends, the upper ends of the arms having inset portions spaced apart a distance

less than the diameter of the ring at the base of the groove.

5 9. A guide for twisters comprising a sizing die adapted to receive and compactly form a plurality of ends in preparation to twisting them in the form of a thread, said die comprising a pair of similar sections each having a hardened insert in which one-half of the sizing opening is formed, means to hold said sections in assembled
10 relation comprising a stationary support having a socket to receive said sections, a pivoted cap for closing the top of the socket, means to hold said cap in closed position, and an adjustable spring-pressed member carried by the cap and
15 engaging the adjacent die section, a stationary guide having openings uniformly spaced about a given axis aligned with the die opening for guiding said ends, and a rotatable and vertically movable funnel mouth disposed adjacent to and converging the ends for entrance into the mouth of
20 said die.

10. A guide for twisters comprising a sizing die adapted to receive and compactly form a

plurality of ends in preparation to twisting them in the form of a thread, said die comprising a pair of similar sections each having a hardened insert in which one-half of the sizing opening is formed, means to hold said sections in assembled
5 relation comprising a stationary support having a socket to receive said sections, a pivoted cap for closing the top of the socket, means to hold said cap in closed position, and an adjustable spring-pressed member carried by the
10 cap and engaging the adjacent die section, a stationary guide having openings uniformly spaced about a given axis aligned with the die opening for guiding said ends, a rotatable and vertically movable funnel mouth disposed adjacent to and
15 converging the ends for entrance into the mouth of said die, and guiding means for said funnel mouth including a yieldable element yielding of which permits removal or replacement of said
20 funnel mouth.

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