

No. 875,711.

PATENTED JAN. 7, 1908.

J. HIGGINSON, JR.
GASSING MACHINE FOR YARN AND THREAD.

APPLICATION FILED MAY 25, 1906.

2 SHEETS—SHEET 1.

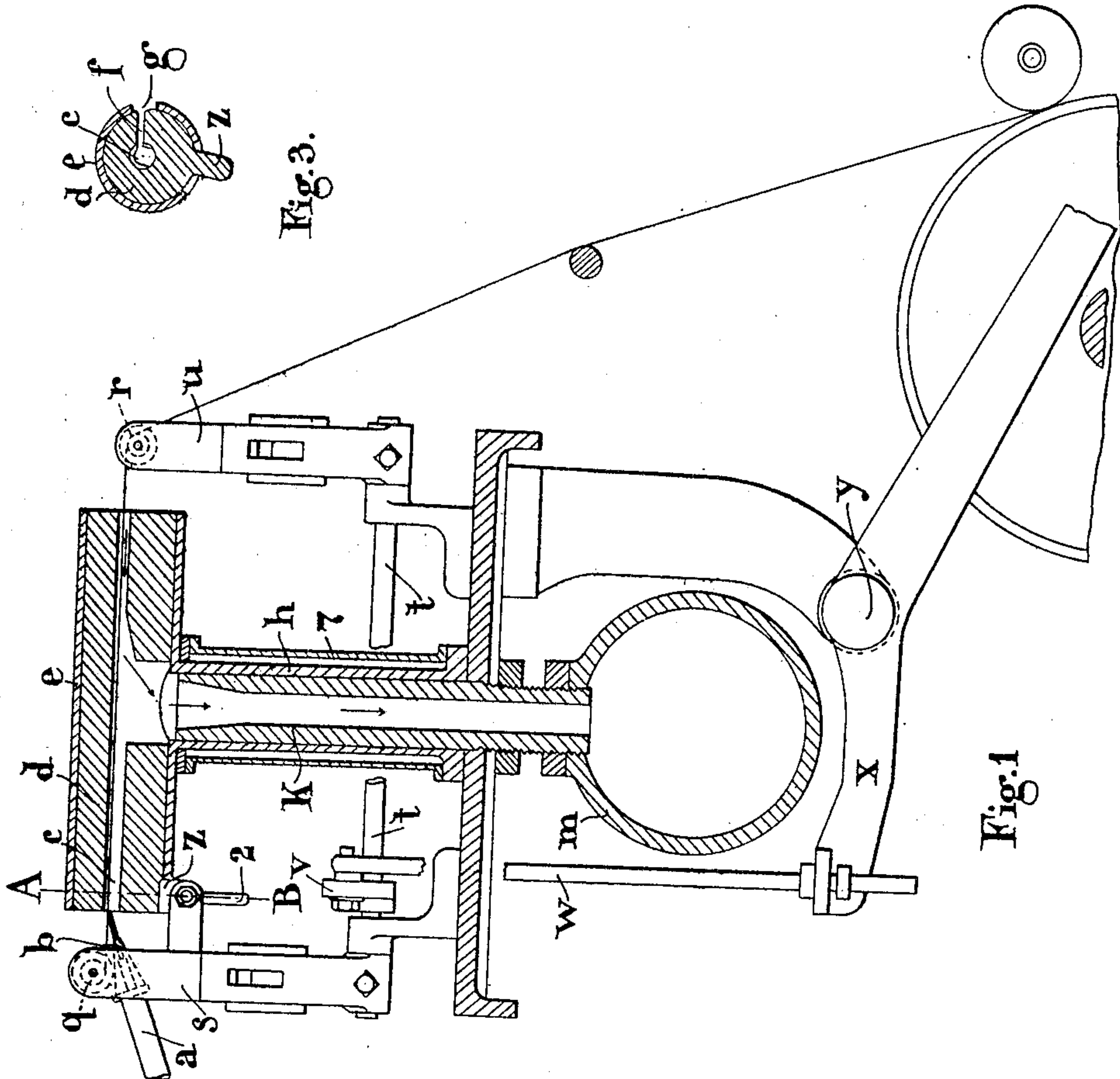


Fig. 3.

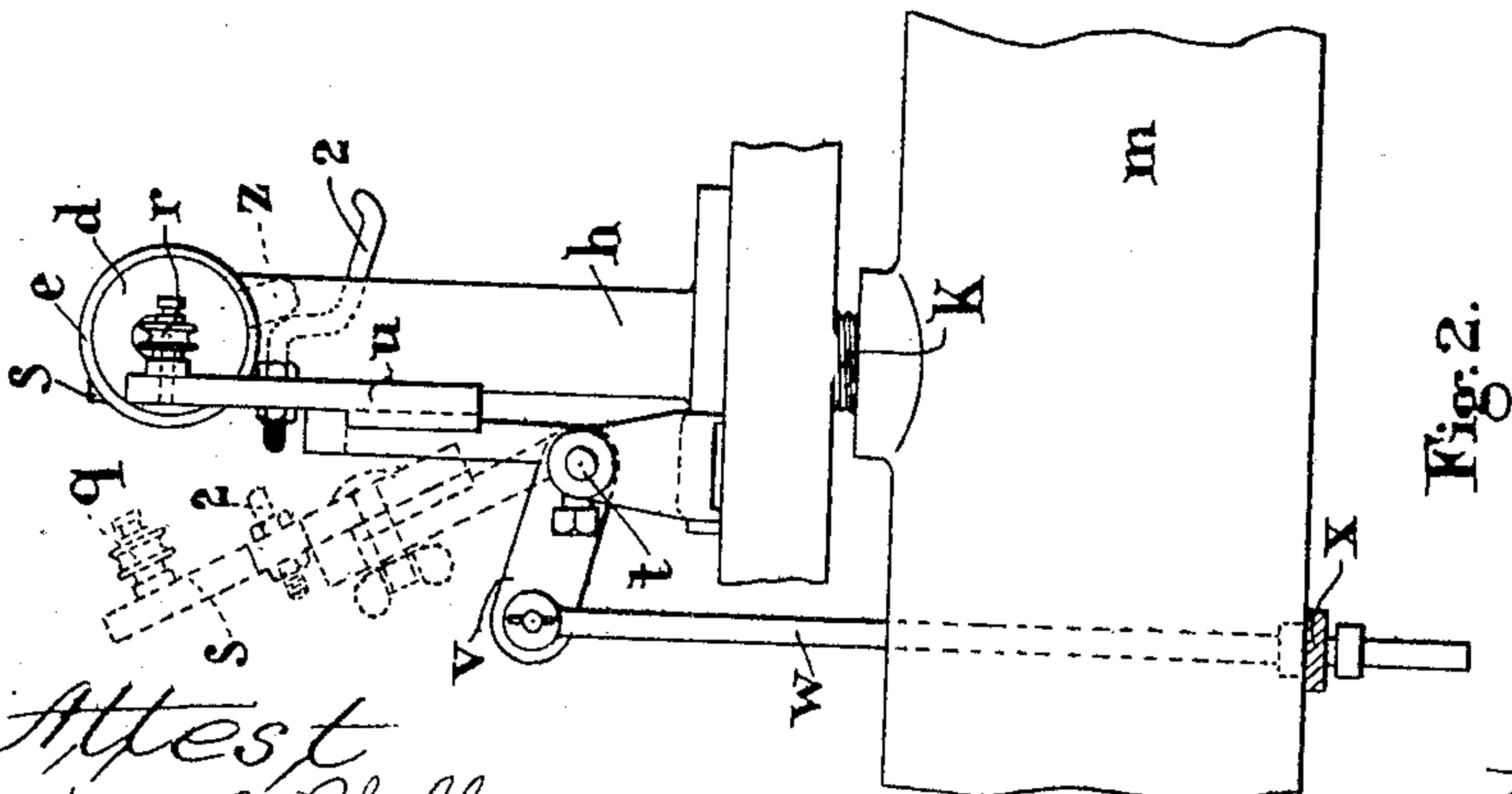


Fig. 2.

Attest
Beatrice G. Phillips.
K. E. Curand

Inventor
Joseph Higginson Jr.
by Spear, Middleton, & Associates
Attys.

No. 875,711.

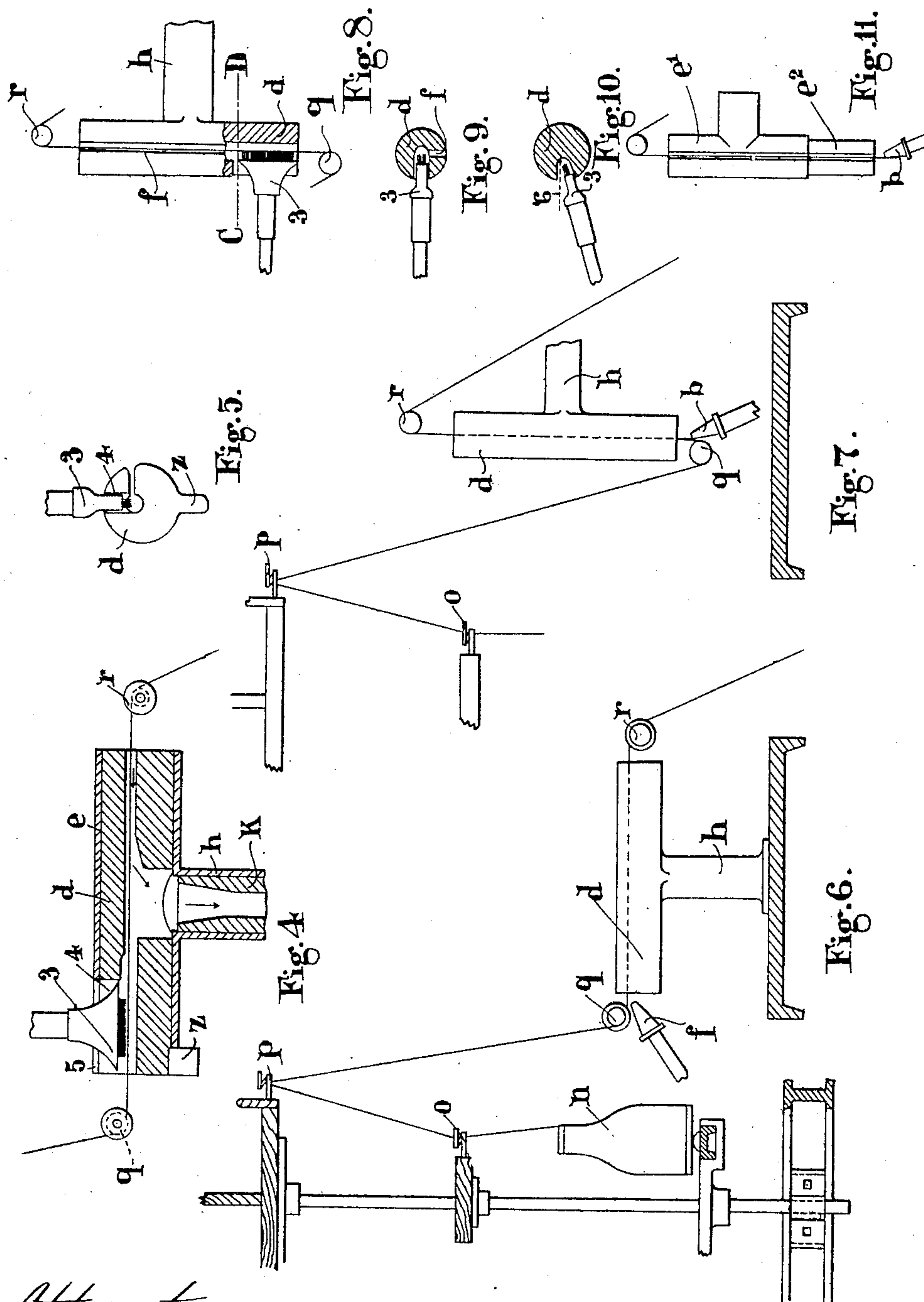
PATENTED JAN. 7, 1908.

J. HIGGINSON, JR.

GASSING MACHINE FOR YARN AND THREAD.

APPLICATION FILED MAY 25, 1906.

2 SHEETS—SHEET 2.



Attest
Beatrice J. Phillips
V.L. Curand

Inventor
Joseph Higginson Jr.
by Spear, Middleton, Donaldson & Spear
ATTYS.

UNITED STATES PATENT OFFICE.

JOSEPH HIGGINSON, JR., OF STOCKPORT, ENGLAND.

GASSING-MACHINE FOR YARN AND THREAD.

No. 875,711.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed May 25, 1906. Serial No. 318,781.

To all whom it may concern:

Be it known that I, JOSEPH HIGGINSON, Jr., a subject of the King of Great Britain and Ireland, residing at Sovereign Works, Stockport, in the county of Chester, Eng-
land, have invented new and useful Im-
provements in Gassing-Machines for Yarn or
Thread, of which the following is a specifica-
tion.

This invention relates to the burners of
gassing machines for yarn or thread, and my
objects are to economize gas, to give a
steadier singeing effect to the yarn and to
carry away the dirt or dust and products of
combustion coming from the thread and
from the flame and so prevent the atmos-
phere of the room in which the machine is
installed from being vitiated.

Heretofore attempts have been made to
collect and suck away the dirt or dust and
the products of combustion coming from the
yarn and from the flame by placing a hood
or the like above or adjacent to the burner.
The movement of the yarn, however, and
drafts produced by other causes act to
carry much of the dust and products of com-
bustion into the room.

The invention consists in projecting the
flame from a burner into a tube and causing
the yarn to pass along said tube, means being
provided for exhausting the contents of the
tube and inducing a current of cool air along
one end of the tube or an extension of the
tube.

Referring now to the accompanying draw-
ings;—Figure 1 is a sectional elevation of a
burner, porcelain tube, thread guides, and
other accessories, constructed and arranged
in one convenient form according to my in-
vention. Fig. 2 is an end elevation of the
same. Fig. 3 is a cross section on the line A
B of Fig. 1. Fig. 4 is a view of a porce-
lain tube similar to that shown at Fig. 1,
but illustrating a modified arrangement of
burner. Fig. 5 is an end elevation of the porce-
lain tube and burner shown in Fig. 4. Fig.
6 is a diagrammatic view showing the man-
ner in which the thread is guided off a cop
and through a tube of refractory material.
Fig. 7 is a diagrammatic view showing an
alternative arrangement of tube, burner, etc.
Fig. 8 is a diagrammatic view, partly a sec-
tion, showing another alternative arrange-
ment of tube, burner and other accessories,
and Fig. 9 is a cross sectional view of the
same, the section being taken on the line C D

of Fig. 8. Fig. 10 is a cross sectional view
showing another alternative arrangement of
tube and burner. Fig. 11 shows a further
modification.

Referring in the first place to Figs. 1, 2
and 3, *a* is a tube which conveys a mixture
of gas and air to the jet burner *b*. The pipe *a*
is supplied with a mixture of air and gas,
which mixture is preferably arranged to
have too small a proportion of air to be an
explosive mixture. The burner is arranged
to give a long flame and to project this long
flame into the hole *c*, in the porcelain tube *d*.
This porcelain tube is inclosed in a metal
tube *e*. The porcelain tube is formed with a
slit *f*; and the metal tube with a slit *g*. To
the metal tube *e* is attached a metal tube *h*,
which I shall call the exhausting tube. This
exhausting tube contains a porcelain liner *k*.
The interior of this liner is in communica-
tion with the interior of the porcelain tube *d*
and is also in communication with the inte-
rior of a main exhausting flue *m*. A ma-
chine is provided with a number of burners,
each furnished with its porcelain tube and
other accessories. All the tubes *h*, on one
side of the machine, communicate with the
main exhausting flue *m*. The thread com-
ing from the cop *n* (see Fig. 6) passes through
an eye *o* and another eye *p*, and then de-
scends and passes round a pulley *q*, through
the porcelain tube, over the pulley *r*, and
then to the bobbin or tube on which it is be-
ing wound. The pulley *q* is mounted on the
upper end of an arm *s*, which is rigidly se-
cured on a shaft *t*. The pulley *r* is carried
on the end of an arm *u* which is also rigidly
secured on the shaft *t*. This shaft is adapt-
ed to be given an angular movement by
means of a crank *v* which is connected by
means of a link *w* with a lever *x* pivoted
about a fixed fulcrum *y*. The lever *x* is
adapted to be operated by hand so as to
swivel the arm *s* from the position shown in
full lines in Fig. 2 to the position shown in
dotted lines and vice versa and to swivel the
arm *u* correspondingly. When the arms are
in the positions shown by full lines, the
thread is stretched through the hole *c* in the
porcelain tube and, when the arm *s* is in the
position shown by dotted lines, and the arm
u is in the corresponding position, the thread
is clear of the porcelain tube. The thread
enters and leaves the porcelain tube by way
of the slits *g* and *f* in the metal tube *e* and the
porcelain tube.

I may if desired close the slit f in the porcelain tube after the thread is inserted within it. This may be done in a convenient manner by providing the arm s with a U-shaped stud 2, which is adapted to engage with a projection z formed on the porcelain tube. When the arm s is being pushed to the right in Fig. 2, the projection z is acted on by the stud 2, and pushed to the right also, thereby partially rotating the porcelain tube d and closing the slit f , as the metal tube e does not rotate with the porcelain tube. When the thread is being withdrawn from the porcelain tube, the motion of the arm s causes the stud 2 to engage with the projection z and uncover the slit f .

I produce a draft in the main exhausting flue m by any suitable means so as to suck the products of combustion and the dirt and charred matter which comes off the thread down the tube h into the main exhausting flue. This main exhausting flue is arranged to discharge its contents in any convenient place. The contents may be discharged into water or the solid matter precipitated onto a traveling band which may carry it away.

The porcelain tube d is shown in Fig. 1 as being continued to the right of the exhausting tube h . This is to enable the thread to be cooled and subjected to a current of cool air before it leaves the tube. Air is drawn to the exhausting tube h from both ends of the porcelain tube d . The left hand end of the tube d in Fig. 1 is entirely filled with hot air and other gas and the right hand end entirely filled with cold air. The thread therefore after being subjected to the action of the flame is drawn through cool air before it leaves the tube. This is a most important matter and constitutes an essential part of my invention. The thread in passing along the right hand portion of the porcelain tube d is moved in a contrary direction to the current of cold air which acts to remove charred matter and dirt from it. I may if desired restrict the hole in the right hand portion of the porcelain tube d so as to give a very narrow opening for the passage of air and produce a very strong draft at that point.

Referring now to Figs. 4 and 5, an alternative arrangement is here shown in which a flat burner 3 is employed which gives a flame which is short in the direction of efflux of the gas from the burner but is long in a direction at right angles to this. A slot 4 is formed in the porcelain tube and a corresponding slot 5 is cut in the enveloping metal tube to admit this burner. The burner and the pulleys q and r are so arranged with respect to the porcelain tube that the thread as far as practicable passes through the hottest part of the flame. In other respects the apparatus shown in Figs. 4 and 5 resembles that shown in Figs. 1, 2 and 3 and the action is in substance the same in the two cases.

Referring now to Fig. 6, a horizontal arrangement of tube is here shown diagrammatically, a jet burner b being employed therewith. In Fig. 7 a vertical arrangement of porcelain tube is shown.

Figs. 8 and 9 show an arrangement of vertical porcelain tube, with a flat burner 3.

Fig. 10 shows another alternative arrangement. In this case one slit serves to admit the burner and to admit the thread. The dotted line 6 represents the plane of motion of the thread in being inserted into and withdrawn from the porcelain tube. The arrangement shown in Fig. 10 may be employed both when the porcelain tube is horizontal and when it is arranged vertically.

Fig. 11 shows the combination with a jet burner b of a metal tube made up of a T piece e' and a straight part e'' as shown.

I may provide the exhausting tube h with a jacket as shown at 7 in Fig. 1. In this jacket I may heat the air supply to the burner or I may employ the jacket for holding water for cooling the exhausting tube.

By means of my invention the products obtained from the combustion of the gas and from the combustion or partial combustion of the yarn are completely or almost completely drawn away and do not mingle with the atmosphere of the room. Moreover the yarn is subjected to the cleansing action of cold air after being subjected to the action of the burner. Two or more threads may if desired be passed in parallel through the same porcelain tube or one thread may be passed in series through the same tube two or more times.

Although I have spoken of a tube constructed of porcelain, I may employ any suitable refractory material. This tube may if desired be made in two or more parts.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In gassing machines for yarn or thread, the combination of a singeing burner for the said yarn or thread, a tube forming a conduit longitudinally through which the said yarn or thread travels while being acted on by the flame from the said burner, and a suction or exhaustion connection opening directly into the said tube, substantially as described.

2. In gassing machines for yarn or thread, the combination of a singeing burner for the said yarn or thread, a tube open at each end forming a conduit longitudinally through which the said yarn or thread travels while being acted on by the flame from said burner, and a suction or exhaustion connection opening directly into the said tube at a point between its ends, substantially as described.

3. In gassing machines for yarn or thread, the combination of a singeing burner for the said yarn or thread, a tube open at each end forming a conduit longitudinally through

which the said yarn or thread travels while being acted on by the flame from the said burner, a suction or exhaustion connection opening directly into the said tube at a point
5 between its ends, and supporting guides for the yarn or thread as it travels through the tube, substantially as described.

4. In gassing machines for yarn or thread, the combination of a singeing burner for the
10 said yarn or thread, a tube open at each end forming a conduit longitudinally through which the said yarn or thread travels while being acted on by the flame from the said
15 burner, a suction or exhaustion connection opening directly into the said tube at a point between its ends, means for passing the yarn or thread into the interior of the tube and supporting guides for the yarn or thread as it
20 travels through the tube, substantially as described.

5. In gassing machines for yarn or thread, the combination of a singeing burner for the said yarn or thread, a tube open at each end forming a conduit longitudinally through
25 which the said yarn or thread travels while being acted on by the flame from the said

burner, a suction or exhaustion connection opening directly into the said tube at a point between its ends, a jacket for the said connection, means for passing the yarn or thread
30 into the interior of the tube and supporting guides for the yarn or thread as it travels through the tube, substantially as described.

6. In gassing machines for yarn or thread, the combination of an open ended tube pro-
35 vided with a lateral aperture for the admission and withdrawal of the yarn or thread and having a suction or exhaustion connection opening directly therein, a liner for the said tube having a lateral aperture corre-
40 sponding with the like aperture in the tube, means for imparting a rotary movement to the liner relatively to the tube, and a burner projecting its flame into the tube, substan-
45 tially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH HIGGINSON, JUNIOR.

Witnesses:

EDWARD MARKS,

VIVIAN ARTHUR HUGHES.