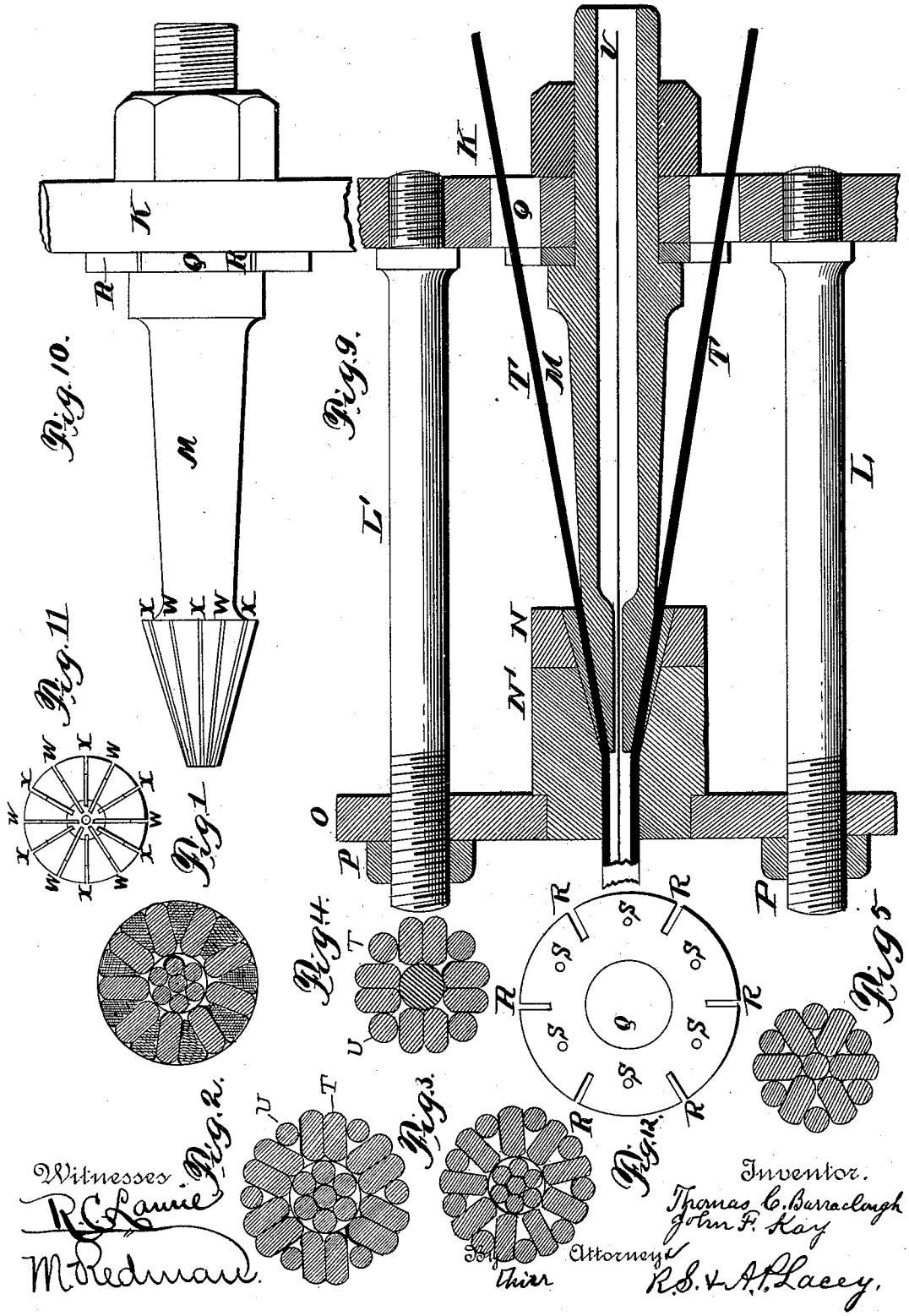
(No Model.) 2 Sheets—Sheet 1.

T. C. BARRACLOUGH & J. F. KAY.

MACHINE FOR MAKING STRANDS FOR WIRE ROPES, &c.

No. 400,285. Patented Mar. 26, 1889.



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Fig. 8.

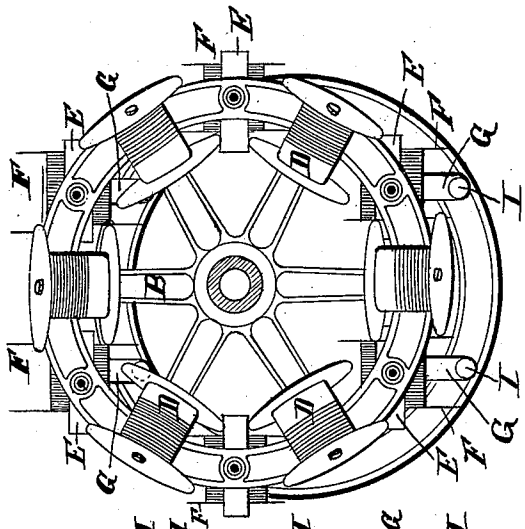


Fig. 7.

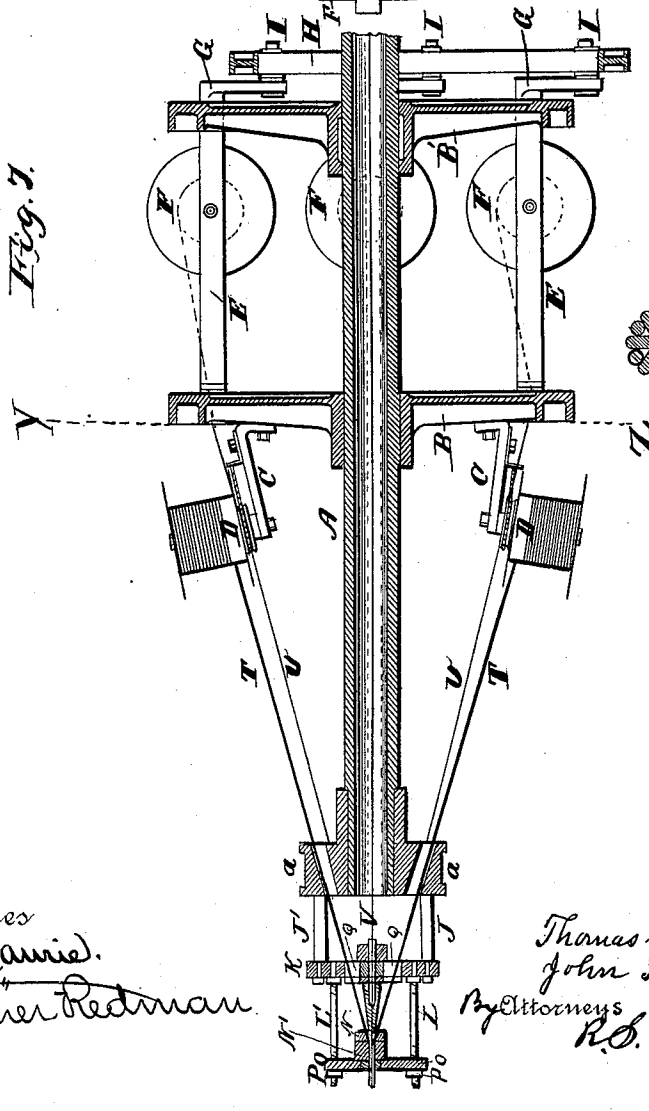
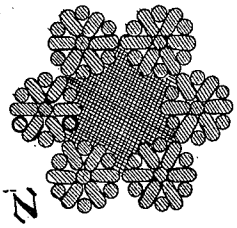


Fig. 6



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UNITED STATES PATENT OFFICE.

THOMAS CRITCHLEY BARRACLOUGH AND JOHN FRETWELL KAY, OF MANCHESTER, COUNTY OF LANCASTER, ENGLAND.

MACHINE FOR MAKING STRANDS FOR WIRE ROPES, &c.

SPECIFICATION forming part of Letters Patent No. 400,285, dated March 26, 1889.

Application filed November 13, 1886. Serial No. 218,805. (No model.)

To all whom it may concern:

Be it known that we, THOMAS CRITCHLEY BARRACLOUGH and JOHN FRETWELL KAY, subjects of Her Britannic Majesty Queen Victoria, residing at Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in Machines for Making Strands for Wire Ropes and Cables; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to machines for forming wire strands for wire ropes and cables; and the improvement consists in the novel features more fully hereinafter set forth, and shown in the annexed drawings, in which—

Figures 1, 2, 3, 4, and 5 illustrate sections of various wire strands. Fig. 1 represents a section of strand composed of flat wires supported by fillings of hemp, jute, manila, or other suitable material placed between the same. Figs. 2, 3, 4, and 5 represent sections of strands formed of flat wires supported by round wires. Fig. 6 represents a section of a wire rope or cable composed of strands, the section of one of which is shown in Fig. 5. Fig. 7 is a side elevation, partly in section, of part of said machine for forming the said strands. Fig. 8 is a vertical section, on the line *y z* of Fig. 7, of part of said machine. Fig. 9 is an enlarged sectional elevation of the conical nozzle and dies and steel guide-ring for holding in position, while being formed into a strand, the said center wire or wires or core, the flat wires, and the supporting-wires or filling. Fig. 10 is an enlarged elevation of the said conical nozzle and steel guide-ring. Fig. 11 is an enlarged front view of said conical nozzle. Fig. 12 is an enlarged front view of the steel guide-ring used by us in conjunction with said conical nozzle and dies for holding said wires in position while being formed or spun into a strand.

Similar letters of reference denote similar parts throughout the several views.

A is a strong hollow shaft or center tube, one end of which is fitted into the head-bearing *a* and the other end in a suitable pedestal at the end of the machine. (Not shown in the drawings.) The shaft revolves carrying with it the rings B and B′, which are keyed thereon at a distance apart, between which the fliers E are supported in a manner presently to be made known. The brackets C are firmly attached to the ring B and are adapted to support suitable bobbins, D, upon which are wound the said flat wires T. This arrangement imparts the necessary twist to said wires. The cradles or fliers E are supported between the rings B and B′ in such a manner that each is free to have a rocking or swinging motion to prevent any twisting of wires U and consequent tensional strain thereupon. These cradles or fliers carry the bobbins F, on which the supporting-wires are wound. If the said supporting-wires are sufficiently soft to permit twisting without any abnormal tensional strain coming thereon, or a filling is to be used of hemp, jute, manila, or other suitable material, then the arrangement of cradles or fliers E may be dispensed with, and the bobbins F may be carried by brackets firmly attached to the ring B′ in the same manner as the bobbins D are carried by brackets C, attached to the ring B.

In the drawings, Figs. 7 and 8, the cradles or fliers E are shown held in such position as to prevent twist being put into the supporting-wires. This position is obtained by the ordinary means used in wire-strand-forming machines—that is, by means of the cranks G, keyed onto the ends of the cradles or fliers E and the crank-ring H and crank-pins I.

J J′ are rods securely attached to the head-bearing of the machine, and carry the lay-plate K, which latter carries the die-studs L L′ and the conical nozzle M.

N and N′ are dies carried by the cross-bar O, arranged to slide on the die-studs L L′, and held by means of the nuts P.

Q is a steel guide-ring, having slots R cut into it, in order to guide and keep in position the flat wires T, and having holes S drilled into it to guide and keep in position the supporting-wires or filling U.

V is a center wire, wires, or core. W are grooves in the conical nozzle M, made sufficiently deep to permit the flat wires T to pass edgewise. X are also grooves in the said coni-

cal nozzle M, made sufficiently deep for the supporting-wires or filling U to pass through. The conical nozzle M, the dies N N′, and the steel guide-ring Q, as represented in the accompanying drawings, have a sufficient number of grooves shown in them to form the strand shown in Fig. 5. The number of grooves in the conical nozzle M and slots and holes in the steel guide-ring Q can be varied to suit the required section of strand to be formed.

The action of the machine is as follows: The bobbins containing the wire having been placed in their respective positions, the wire or wires and filling are first passed through holes in the head-bearing A and afterward through the lay-plate K and the steel guide-ring Q, and then into the grooves of the conical nozzle M. The dies N and N′ are then moved up the die-studs L L′ by means of the nuts P, close onto the conical nozzle M, thereby covering up the grooves, but not so as to prevent the free passage of the wire or wires and filling along them. The several wires and filling are drawn from the body of the machine through the dies N N′ by any well-known mechanism—such as commonly employed for the purpose—while at the same time the body of said machine, which is that portion shown in Fig. 7, is revolved in the usual way, and forms the wires and filling into a single strand.

Fig. 6 shows a section of rope composed of six strands—such as that shown in Fig. 5—arranged about a filling of hemp, jute, &c.

The products of the machine (shown in Figs. 1 to 6, inclusive) form no part of the present invention, as they are specifically claimed in an application filed by us February 11, 1886, Serial No. 191,608.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination of the hollow shaft, the head-bearing, the lay-plate, the guide-ring Q, the dies, and the conical nozzle supported between the dies and the lay-plate, substantially as set forth.

2. The combination of the hollow shaft, the lay-plate carried by said shaft, the die-studs having their inner ends fastened to the lay-plate, the cross-bar adjustably held upon the free ends of the die-studs, the dies, and the conical nozzle supported between the lay-plate and said dies, substantially as shown and described.

3. The combination of the hollow shaft and the head-bearing, the lay-plate, the guide-ring, the dies, and the conical nozzle carried by one end of the hollow shaft, the two rings keyed near the opposite end of said shaft, the brackets having bobbin-supporting arms fastened to the inner ring, the fliers having corresponding bobbin-supports journaled between the rings, and means, as the cranks and crank-ring, for moving said fliers about their axis, substantially as and for the purpose described.

In testimony whereof we affix our signatures in presence of two witnesses.

THOMAS CRITCHLEY BARRACLOUGH.
JOHN FRETWELL KAY.

Witnesses:
EDWARD S. CHESNEY,
SAMUEL HALLOWS,
Both of 51 *South Kent St., Manchester.*