(No Model.)

F. STANSFIELD.

APPARATUS FOR BRUSHING POLYGONAL BOLTS.

No. 256,066. Patented Apr. 4, 1882.

Fig. 1

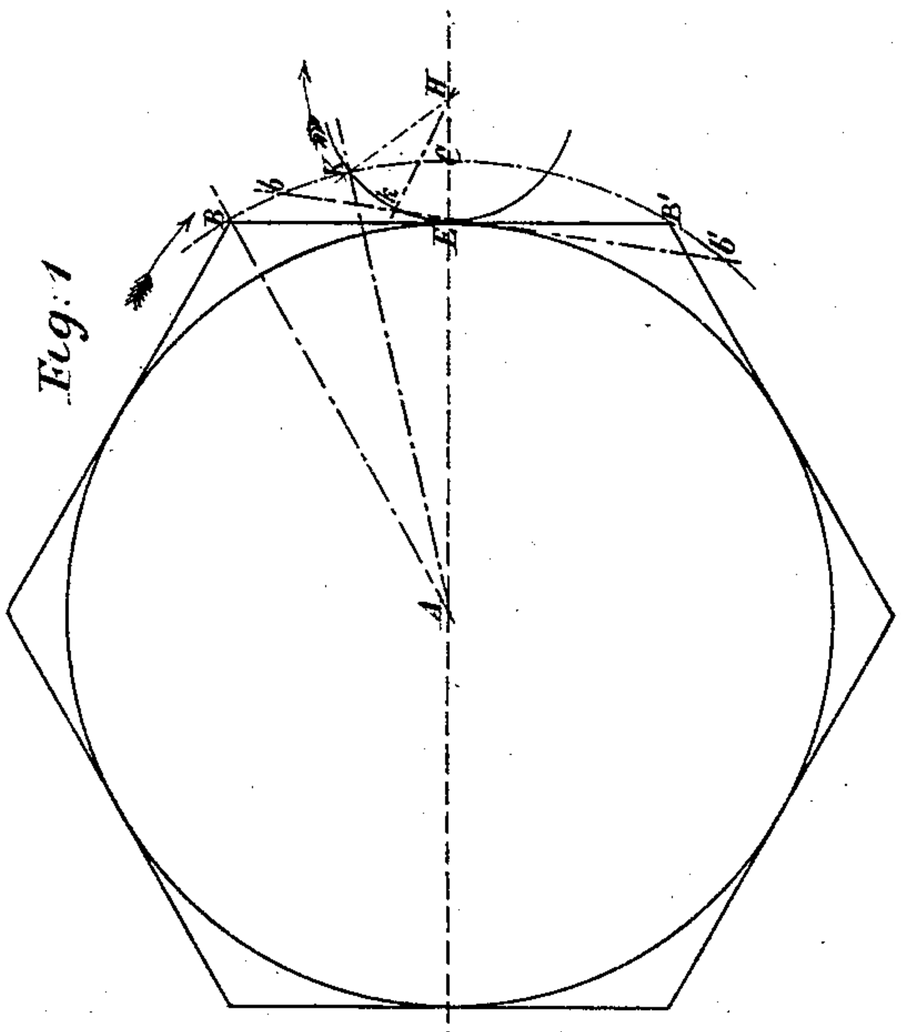


Fig. 3

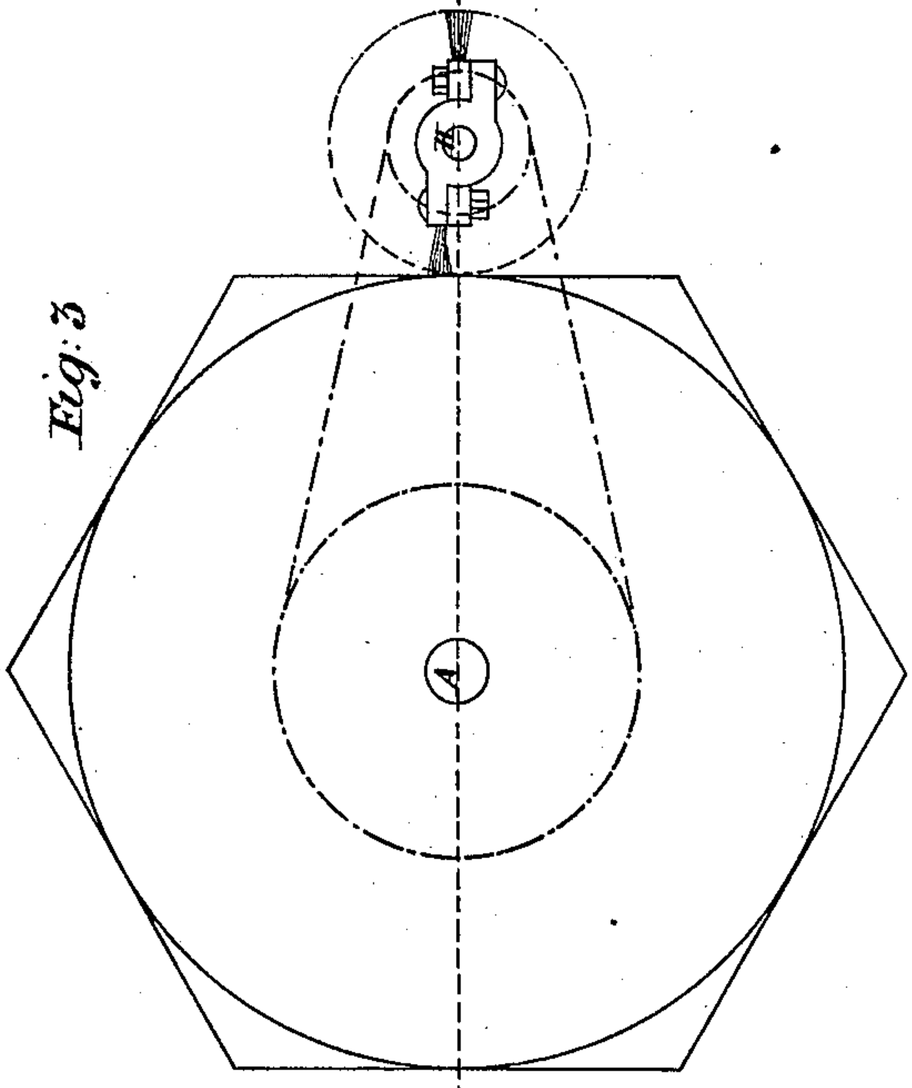


Fig. 2

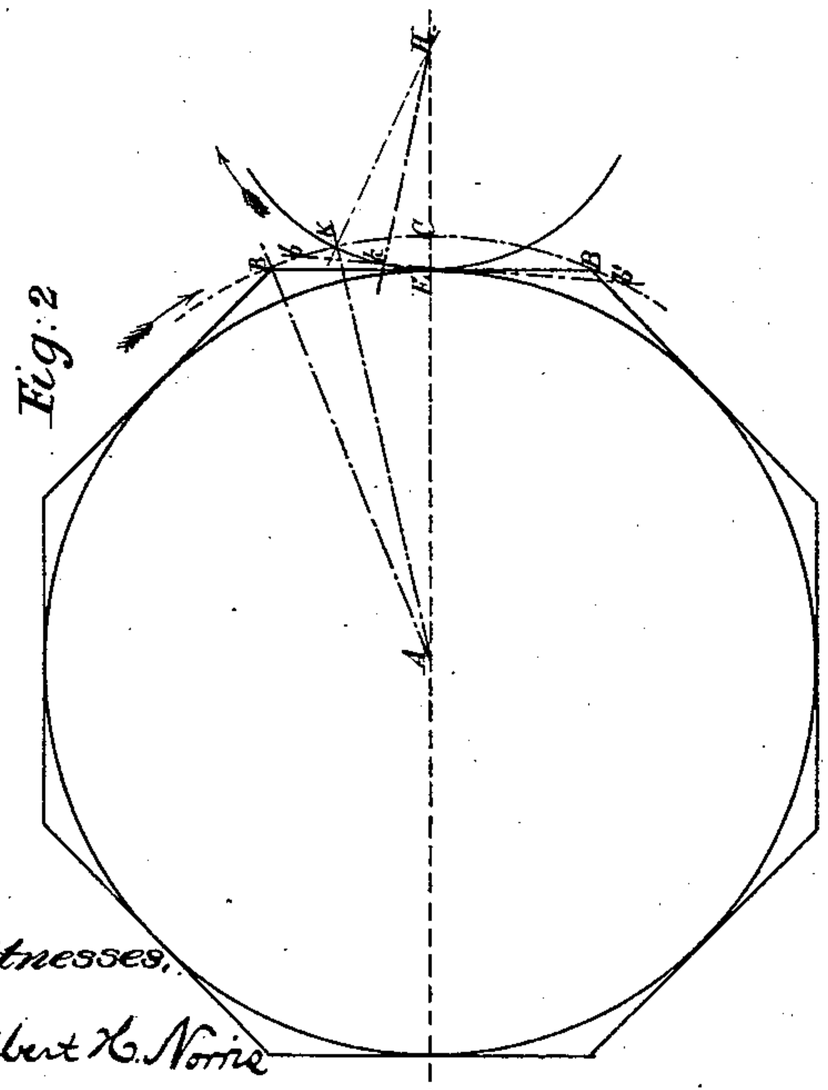
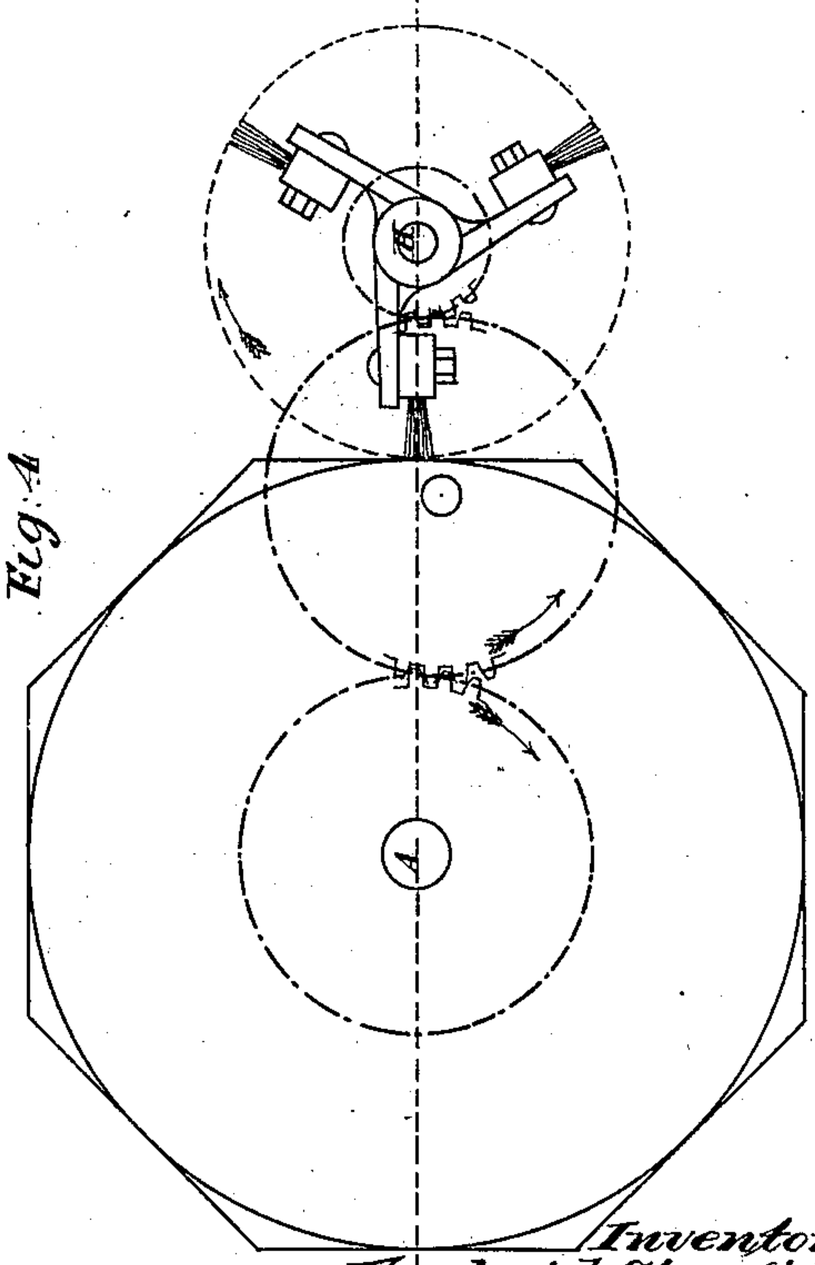


Fig. 4



Witnesses:

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UNITED STATES PATENT OFFICE.

FREDERIC STANSFIELD, OF BRADFORD, COUNTY OF YORK, ENGLAND.

APPARATUS FOR BRUSHING POLYGONAL BOLTS.

SPECIFICATION forming part of Letters Patent No. 256,066, dated April 4, 1882.

Application filed November 21, 1881. (No model.) Patented in England October 12, 1881.

To all whom it may concern:

Be it known that I, FREDERIC STANSFIELD, a citizen of England, residing at Bradford, in the county of York, England, corn miller, have invented an Improvement in Apparatus for Brushing the Surfaces of Polygonal Bolting or Dressing Machines, (for which I have a patent in Great Britain, bearing date 12th October, 1881, No. 4,449,) of which the following is a specification.

In bolting or dressing machines used for dressing flour or other pulverulent substances it is necessary from time to time to clear off the particles adhering to the porous fabric through which the fine powder has to pass. When the machines have cylindrical cages or reels this is readily effected by applying brushes; but in cases where the reel is of polygonal form, when brushes are employed as they are at present arranged it is necessary to give them a radial movement to and from the axis of the reel, so that they may accommodate themselves to the flat sides successively presented to them.

My invention relates to means of applying revolving brushes to polygonal reels in such a manner that without moving radially they accommodate themselves to the surfaces that are to be brushed. For this purpose I fix on an axis parallel to the axis of the reel brushes which are made of such radius and caused to revolve at such velocity relatively to that of the reel that they bear against and rub over with uniform or nearly uniform pressure the principal part of the flat polygonal surfaces presented to them on the reel.

The polygons employed for bolting or dressing machines are mostly regular hexagons or regular octagons. I will therefore describe applications of my invention to these figures as examples of the method that may be followed in applying it to polygons of other forms.

Referring to the accompanying diagrams and figures, Figure 1 is a diagram showing the application of a revolving brush to a hexagonal frame, and Fig. 2 is a diagram showing its application to an octagonal frame.

In both diagrams the same letters of reference are employed to indicate corresponding points.

A being the center of the polygonal frame, and H being the center around which the brush is to revolve, I describe the circular arcs BC and EJ, intersecting at K, and join AK and HK. Now, assuming the polygon and brush to be revolving in the direction of the arrows, the velocity of the brush is to be such relatively to that of the polygon that the point of the brush will travel from E to K in the same time as the angle of the polygon travels from B to K. As the angle EHK is traveled through by the brush in the time that the angle BAK is traveled through by the polygon, the angular velocity or number of revolutions of the brush per minute should be to that of the polygon in the proportion of the angle EHK to the angle BAK. By following the setting out shown in Figs. 1 and 2 the brush will obviously be made to touch the side of the polygon at the two angles B and B′ and at the middle E. Taking a point, *b*, half-way between B and corresponding point, *b′*, such that B′*b′* is equal to B*b*, and joining *bb′*, this line will show the position of the side of the polygon midway in its movement over the arc BK. Taking also point *k* midway in the arc EK, this point will be that of the brush at the same moment that the side of the polygon is in the position *bb′*. It will be seen that if *k* does not absolutely coincide with the point where *bb′* intersects the circular arc EK, it is so near to it that the deviation is imperceptible; and if other positions of the side of the polygon and corresponding positions of the brush be taken, it will be found that the point of the brush is always nearly coincident with the side of the polygon, so that the brush, having a certain elasticity, will practically bear against and rub over the whole side of the polygon with approximately uniform pressure.

In what has preceded I have assumed the point H, representing the axis of the brush, to be taken anywhere, and shown how the angular velocity of the brush relatively to that of the polygon is to be determined. As, however, it is necessary that the brush after leaving one side of the polygon should perform the clear part of its revolution when it is away from the polygon in such time that it will again similarly meet and brush another side of the polygon, the ratio of the two velocities

must obviously be a simple and commensurable one.

In the case of the hexagon, Fig. 1, a convenient ratio of the angular velocity of the brush to that of the polygon is that of three to one. Consequently the point H is to be determined such that the angle EHK is three times the angle BAK. As the whole angle BAE is thirty degrees, (taking KAE=13° 20′, consequently BAK=16° 40′,) H must be such that EHK=50°, or three times 16° 40′. It will be found by setting out or computation that the distance AH of the brush-spindle from the center of the hexagon is to the angular radius AB as 1.166 is to 1, very nearly. The brush will then pass over every alternate side of the hexagon, missing the intermediate sides; but by fixing two brushes opposite to each other on the axis H every side of the hexagon will be brushed during each revolution.

In the case of the octagon, Fig. 2, the relative speeds of the polygon and the brush are conveniently taken in the proportion of three to eight. In this case, (the whole angle BAE being 22° 30′, if KAE be = 13°, and therefore BAK=9° 30′,) H is to be taken such that EHK is 25° 20′, to which BAK=9° 30′ is in the proportion of three to eight. It will be found that in this case AH is to AB in the proportion of about 1.45 to 1. The brush will then pass over every third side of the octagon, always missing two intermediate sides. All the eight sides, however, will be brushed in their turn during three revolutions of the octagon or eight revolutions of the brush. Should it be desired to brush all the sides in every revolution of the octagon, three brushes may be fixed on the axis H, equally spaced around it.

The brush-spindle H may be driven by a chain passing over chain-wheels suitably proportioned, as shown at Fig. 3, for the hexagon-frame, or by toothed gearing, with an intermediate wheel, as shown for the octagon frame at Fig. 4; or it may be driven by other suitable gear. Also, instead of employing only one spindle, H, with its brush or set of brushes, several such spindles might be arranged around the polygon, the sides of which might thus be repeatedly brushed during each revolution.

Having thus described the nature of my invention and the best means I know of carrying it into practical operation, I claim—

1. The combination, with a rotary polygonal bolting or dressing frame, of a brush fixed upon a spindle arranged parallel to the axis of the said frame, and revolving in the same direction therewith at a speed proportioned to that of the frame, in the manner described, to cause the points of the brush to travel over and rub the surface of the frame at a substantially uniform pressure, as and for the purpose set forth.

2. The combination, with a rotary polygonal bolting or dressing frame, of a brush fixed upon a spindle arranged parallel to the axis of the said frame, and mechanism for revolving the brush in the same direction as the said frame at a speed proportioned to that of the frame, in the manner described, to cause the points of the brush to travel over and rub the surface of the frame at a substantially uniform pressure, as and for the purpose set forth.

3. The combination, with the rotary polygonal bolting or dressing frame, of a brush fixed upon a spindle arranged parallel to the axis of said frame, and connecting mechanism, such as described, between the frame and the brush-spindle, for revolving the brush in the same direction as the frame at a speed proportioned thereto, in the manner described, to cause the points of the brush to travel over and rub the surface of the frame at a substantially uniform pressure, as and for the purposes set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 5th day of November, A. D. 1881.

FREDERIC STANSFIELD.

Witnesses:

H. F. KILLICK,
Notary Public, Bradford.

WILLIAM THORNTON,
Solicitor's Clerk, Bradford.