Nov. 1, 1932. J. DRONSFIELD 1,886,089

GRINDING MACHINE

Filed Jan. 23, 1932 6 Sheets-Sheet 1

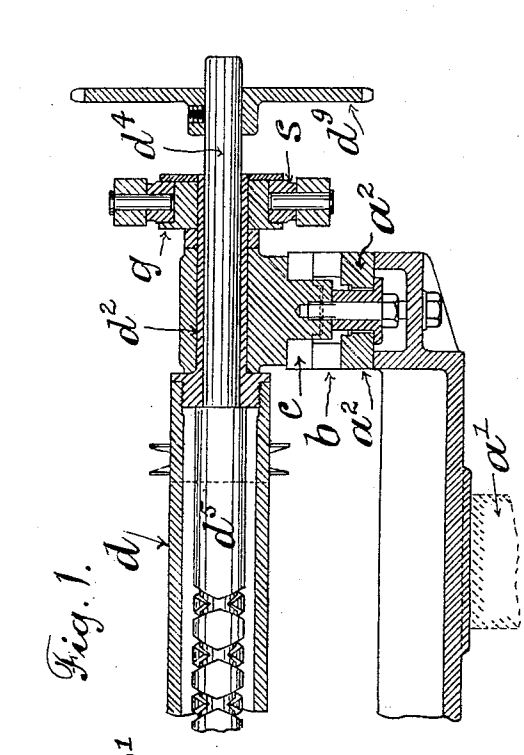

Fig. 1.

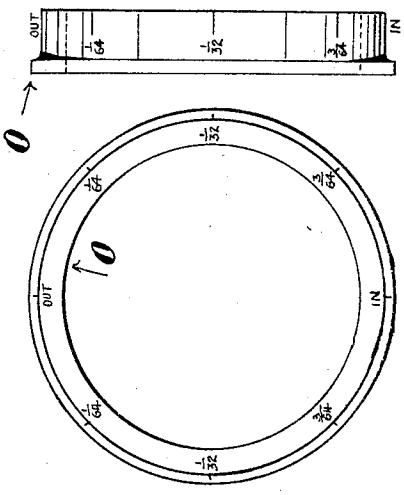

Fig. 4.

Fig. 5.

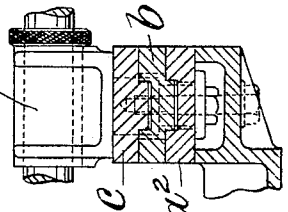

Fig. 3.

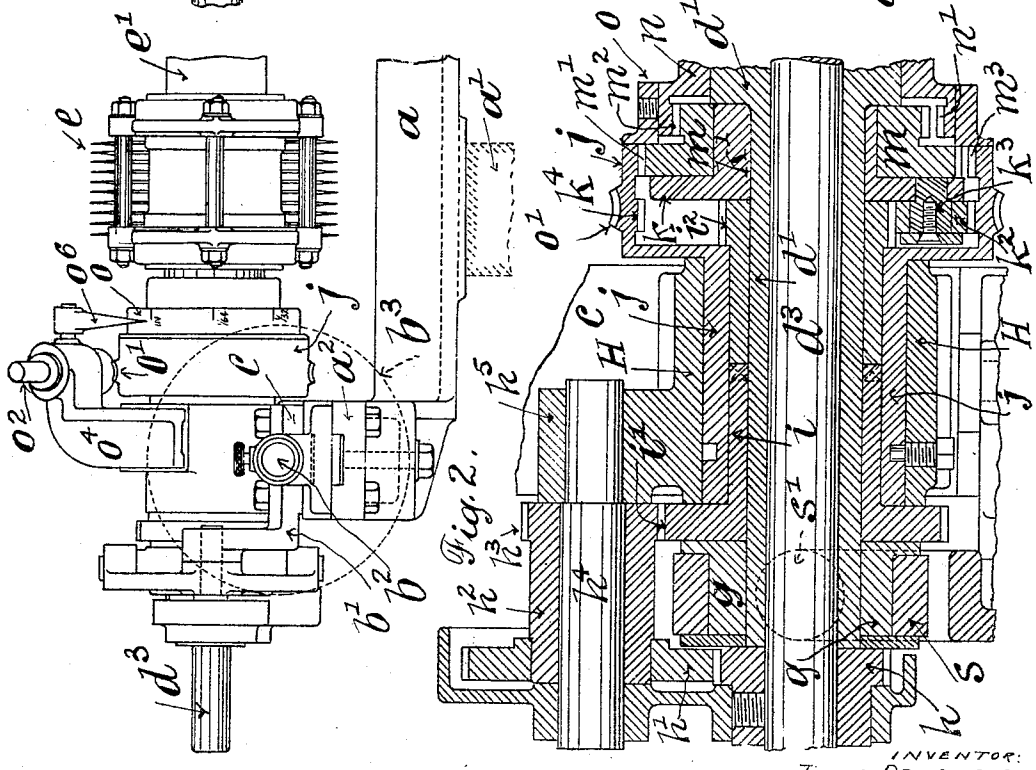

Fig. 2.

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Nov. 1, 1932. J. DRONSFIELD 1,886,089

GRINDING MACHINE

Filed Jan. 23, 1932 6 Sheets-Sheet 2

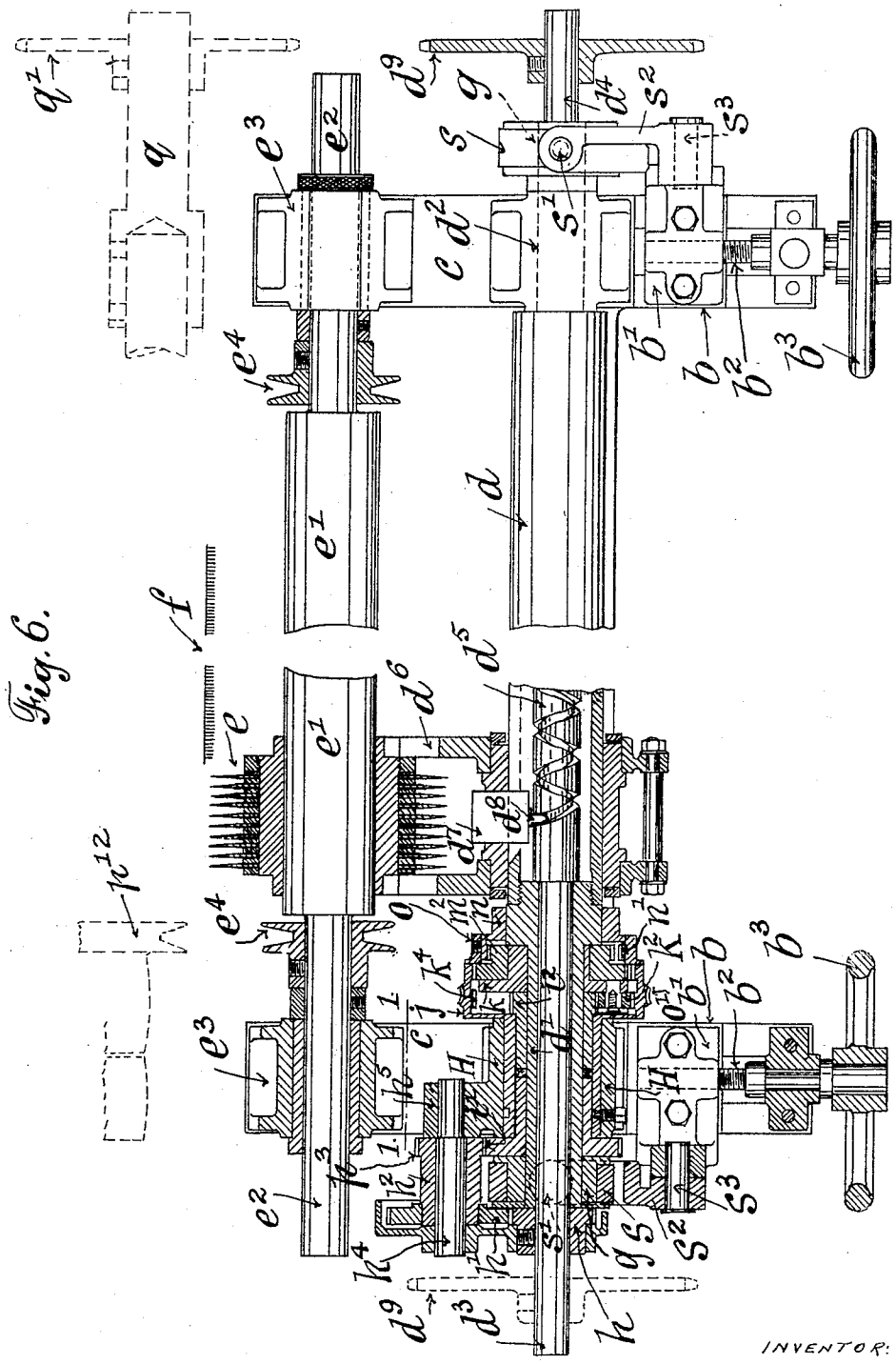

Fig. 6.

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Nov. 1, 1932. J. DRONSFIELD 1,886,089

GRINDING MACHINE

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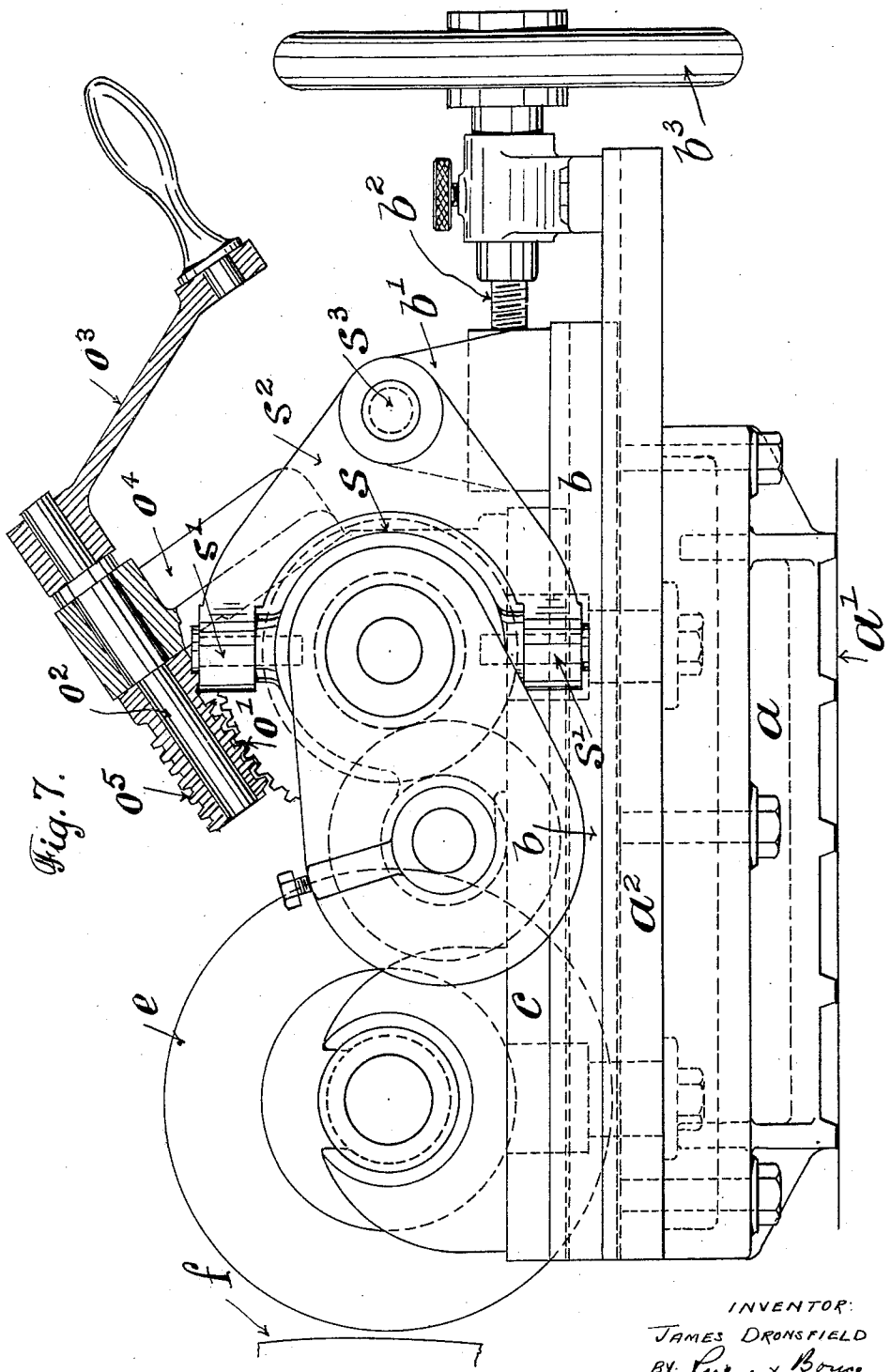

Fig. 7.

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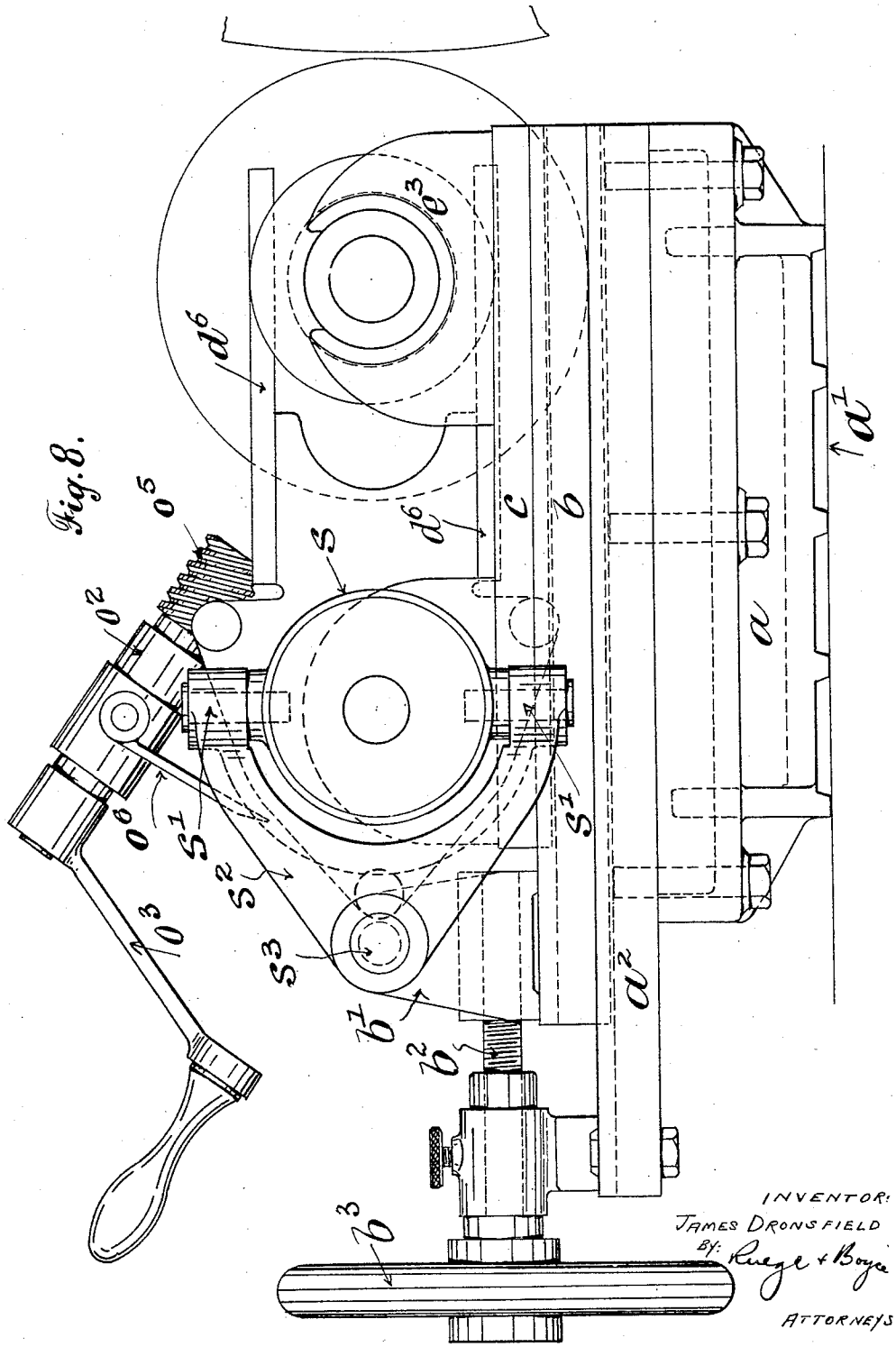
Nov. 1, 1932. J. DRONSFIELD 1,886,089

GRINDING MACHINE

Filed Jan. 23, 1932 6 Sheets-Sheet 4



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Nov. 1, 1932. J. DRONSFIELD 1,886,089

GRINDING MACHINE

Filed Jan. 23, 1932 6 Sheets-Sheet 5

Fig. 9.

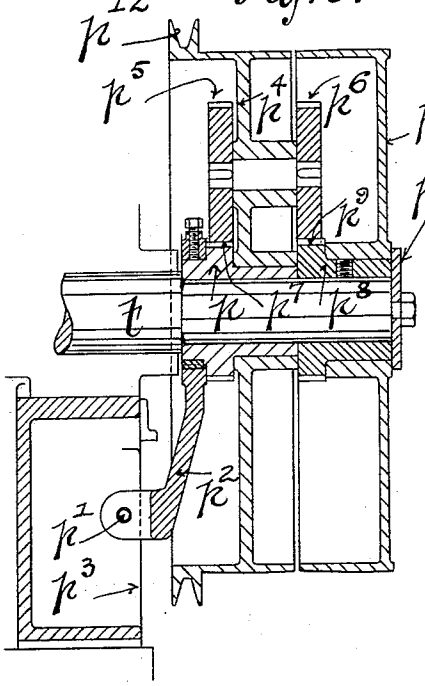


Fig. 10.

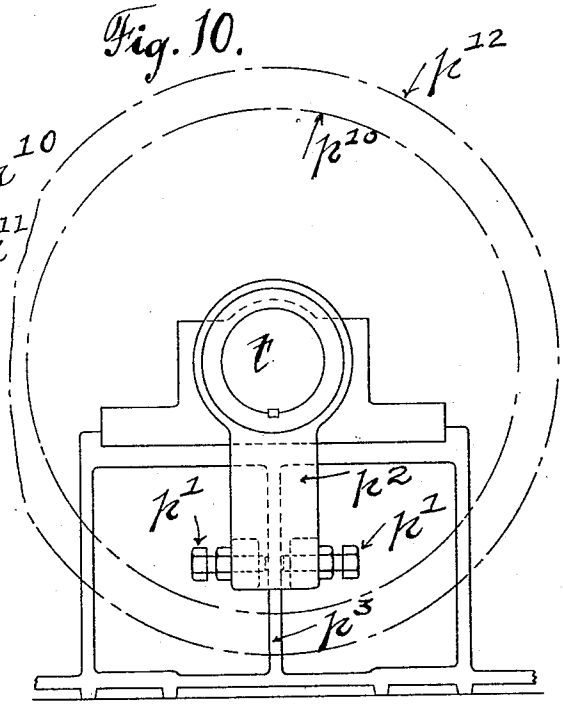
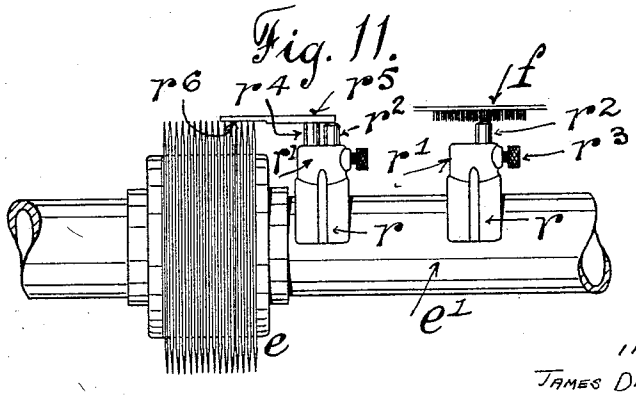


Fig. 11.



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Nov. 1, 1932. J. DRONSFIELD 1,886,089

GRINDING MACHINE

Filed Jan. 23, 1932 6 Sheets-Sheet 6

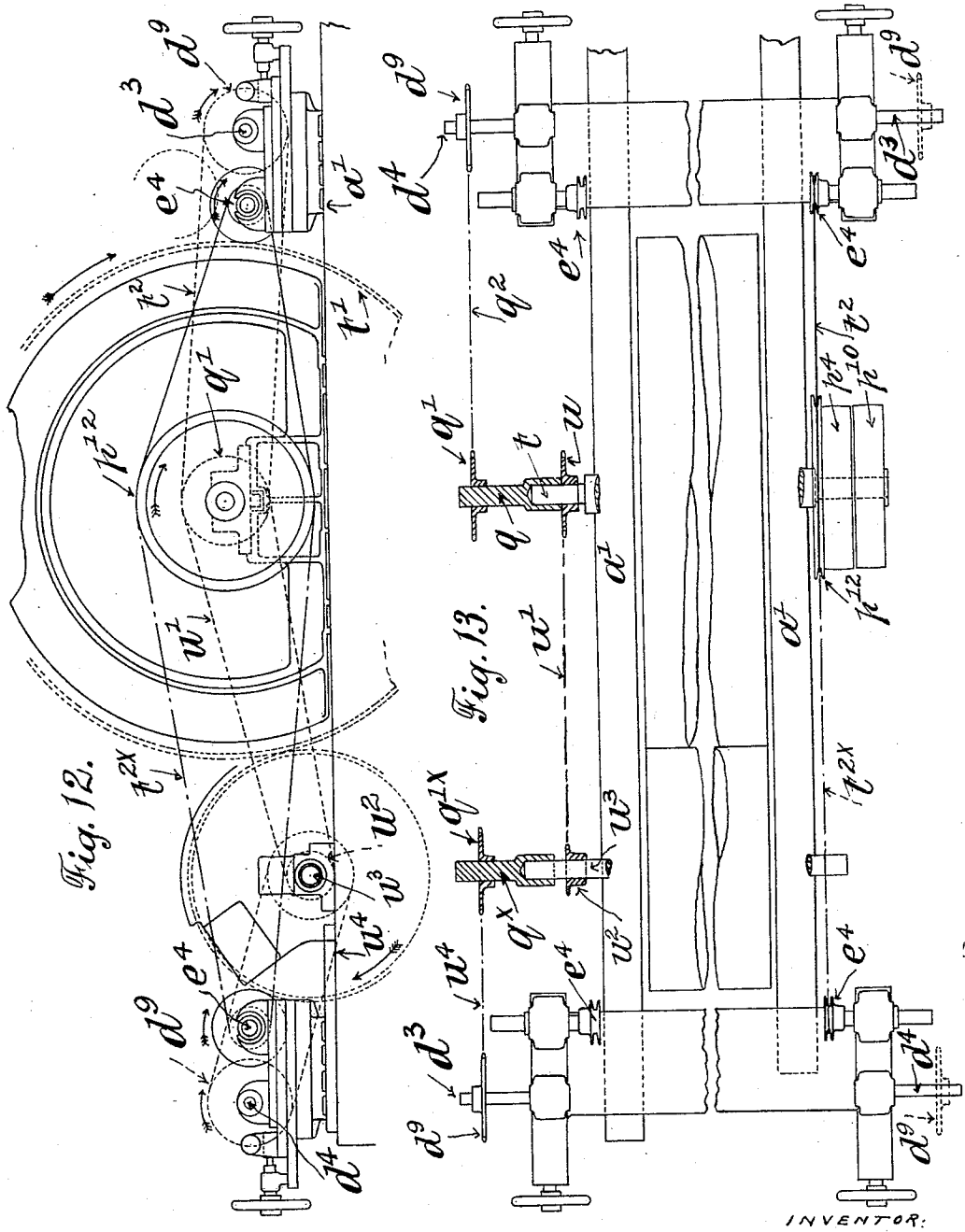

Fig. 12.

Fig. 13.

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Patented Nov. 1, 1932 1,886,089

UNITED STATES PATENT OFFICE

JAMES DRONSFIELD, OF ATLAS WORKS, OLDHAM, ENGLAND

GRINDING MACHINE

Application filed January 23, 1932, Serial No. 588,306, and in Great Britain October 8, 1931.

These improvements are concerned with substantially automatic mechanism or apparatus for re-grinding or re-needle-pointing the dents or teeth of filleting, or wire clothing such as is mounted upon carding engine cylinders, doffers, or like cylindrical bodies, used in machines employed in the textile trades, and for effecting such purpose with the cylinders or doffers in situ in the cards, etc.

It is known to employ apparatus to side grind or needle-point the dents or teeth of filleting or clothing applied to carding engine cylinders, doffers, and such like, and attempts have been made to needle-point the dents upon cylinders and doffers following considerable use, with the object of rehabilitating the dents or restoring them to a more efficient condition by a subsequent grinding or needle-pointing with the clothed cylinder or doffer in position.

My improvements are devoted to providing a mechanism or apparatus which can be applied to or mounted upon the frame-work of a carding engine and used for the purpose of re-needle-pointing the dents of the filleting mounted on the main cylinder or doffer with the object of lengthening the effective period of life of the wire by re-establishing the "needle-point" originally put-on by the card maker, and of delaying for a considerable period the necessity for re-clothing the cylinder or doffer with fresh filleting.

The mechanism according to the invention comprises a complete attachable and detachable apparatus suitable for dealing with the wire on the main cylinder or doffer and either for right or left hand cards, and said apparatus comprises a travelling grinder consisting of spaced emery discs, and this travelling grinder is rotated by a grinder tube at a considerable speed. It is also traversed backwards and forwards across the main cylinder etc., at a slow speed.

The grinder tube or support for the travelling grinder and its traversing mechanism are mounted in bearings or supports on movable slides or carriages, the same being adapted to operate in such a fashion as will cause the spaced discs on the grinder to gradually and very slowly penetrate between the dents say to a depth of $\frac{1}{16}$ of an inch from the setting position and then to be gradually and very slowly retracted. As thus, the said spaced discs progressively penetrate between and inwards of the dents and are thereafter just as slowly retracted, the progressive penetration and retraction occupying a considerable period of time as it might be two hours by way of example. The advancement and retraction of the spaced discs constituting the grinder, is effected by means of slowly moving eccentrics actuated by a speed reducing gear driven from the right and left hand traversing screw which traverses the grinder. There is provided hand-operated setting devices by operation of which the entire mountings for grinder tube, right and left hand traversing screw, etc., can be set upon the supports applied to the carding engine frame-work to permit of any required initial manual setting of the discs of the grinder parallel with respect to or into or between the dents on the main cylinder, doffer, etc.

Further, the gear train by which the eccentrics are operated from the right and left hand traversing screw to slowly advance and slowly withdraw the group of mechanism including the revolving grinding discs, etc., is such, that provision can be made by combined hand-operated mechanism to quickly operate the gears and set the eccentrics to place the revolving grinding discs to any setting relatively to the dents being ground which is within the range of the mechanism, and there may be arranged an exterior graduated scale which, when a provided manually operated gear is worked, moves with respect to a pointer.

We also provide means to drive the shell or tube supporting the revolving grinding discs at a suitable speed from a convenient revolving shaft, and also measn to drive the right and left hand screw-threaded shaft (which traverses the known forks for the revolving grinding discs) backwards and forwards, as also other driving means necessary and which are auxiliary to an ordinary carding engine, but which may be requisite for working any mechanism in necessary manner for the object in view.

I shall now describe an approved arrangement in accordance with the foregoing, and which is suitable for re-needle pointing the main cylinder of a carding engine, or the doffer of a carding engine, either of right or left hand type.

Only so much of a carding engine structure is illustrated as will serve the purpose of explanation.

Throughout the following description it is intended that reference should be made to the accompanying drawings, wherein:—

Fig. 1 is a general front view of the mechanism or apparatus, part being represented in outside elevation and part in section.

Fig. 2 is an enlarged sectional view of the slow motion gear.

Fig. 3 is a section on the line 1—1, Fig. 6.

Figs. 4 and 5 are separate detail views of the indicating dial or scale.

Fig. 6 shows a general plan view of the mechanism or apparatus and other adjuncts of the carding engine and should be examined along with Fig. 1.

Fig. 7 is an end elevation of the mechanism or apparatus looking from the left of Fig. 6.

Fig. 8 is an end elevation of the mechanism or apparatus looking from the right of Fig. 6.

Fig. 9 shows a section of a speed reducing gear.

Fig. 10 is an end elevation of Fig. 9.

Fig. 11 shows the use of a simple setting gauge for use when setting the grinder device to the teeth or dents on the wire clothed cylinder or the like.

Figs. 12 and 13 are diagrammatic side elevation and plan indicating the disposition of the apparatus in connection with a carding engine, the disposition at the right-hand end being that for grinding the main cylinder of the carding engine, and the disposition at the left-hand end being that for grinding the doffer.

In the mechanism or apparatus illustrated by the drawings, there is provided a built-up rail structure, one on the right-hand and one on the left-hand, and such are suitably spaced and cross-connected, the drawing showing such structures as being fixed to a strong shaped cross-rail *a*. This cross-rail *a* is adapted to be bolted to the side frames a^1 of the carding engine, either to serve for the main cylinder, or the doffer, after temporary removal of any of the ordinary devices from the carding engine which would obstruct the application of the mechanism or apparatus.

The built-up rail structures, one on the right-hand and one on the left, comprise a fixed bed *a*2 with planed ways, upon each of which is mounted a lower carriage or slide element *b* with bolted-on upright bracket *b'*, each such lower carriage or slide element *b* being adjustable by a screw *b*2 and hand-wheel *b*3 permitting manual setting. There is a further upper carriage or slide *c* upon which I mount bearings for the socket-like shafts or ends d^1, *d*2 of the setting or slotted tube *d*, and there are bearings in such socket-like shafts or ends d^1, *d*2 for the axle ends *d*3, *d*4 for the well known right and left hand screw-threaded shaft *d*5 of the traverse motion and for other elements to be later mentioned. The upper carriages or slides *c* which sustain the bearings for the socket-like shafts d^1, *d*2 for the setting or slotted tube *d*, and within which the axle ends of the right-and-left hand screw-threaded shaft *d*5 for traversing the grinding device rotate, are, however, automatically moved to slowly advance the grinding device *e* of grouped grinding discs (after the manual setting) deeper between the teeth or dents *f*, and then to slowly retract the grinding device *e*. A portion of the teeth or dents in the clothing or support are diagrammatically represented at *f* in Fig. 6.

The shell e^1 for the grinding device *e*, that is, the tube upon which said revolving grinder device is carried and upon which it moves laterally to right and left has its axle ends *e*2, *e*2, supported in bearings in swivelling brackets *e*3, *e*3, mounted on the upper carriages or slide elements *c*. The carriage or slide elements *c*, *c*, upon which these brackets are mounted are very slowly traversed towards and from the main cylinder or the like of the carding engine, and the said axle *e*2 can be driven through a grooved pulley *e*4 and link belt from any suitable part of the carding engine or otherwise, as will be later explained, say at about 800 revolutions per minute.

There are the known forks d^6 or their equivalent for traversing the grinder device *e* and the boss of said fork travels upon the setting or slotted tube *d*, and there is the known guide fork block d^7 with "butter-fly" d^8 engaging the right and left hand screw-threaded shaft d^5 encased by the setting or slotted tube *d*. This has already been referred to, and the shaft or axle ends d^3, d^4 have been mentioned as held in socket-like shafts d^1, d^2, which are mounted above the upper carriages or slide elements *c* which are very slowly advanced and very slowly retracted to further insert or withdraw the grinder device *e* between the dents or teeth.

There is provided as to socket-like shafts d^1, d^2 of the traversing mechanism, sheaths, that is, two sheaths *s*, *s*, with which eccentrics *g*, *g* co-operate, which eccentrics have an eccentricity of say 1/32 of an inch, and which are later dealt with, and these sheaths *s*, *s* have at s^1, s^1, two point anchorage devices s^2 attached at s^3 to the upright brackets b^1 fixed to the lower carriages or slide elements *b*.

The gearing for effecting the slow automatic advancement and slow automatic retraction of the rotating and traversing grinder device *e*, that is, for driving the eccentrics

g, g, is shown located on the left-hand side of the mechanism, and the known setting or slotted tube d serves as a coupler conveying motion imparted through the very slow motion gear group, now to be described, to the eccentric g at the other or non-gear end of the mechanism.

A very effective slow motion which I have devised and employ for the purpose, is illustrated in the drawings, and is as follows.

There is a spur wheel h fixed on the axle end d^3 of the right-and-left hand screw-threaded traversing shaft d^5, and this gears with a spur wheel h' mounted on a sleeve h^2, which sleeve h^2 has another spur wheel h^3 mounted on it, said sleeve being carried on an axle h^4 supported in an extension h^5 of the main bearing H carried on the upper carriage or slide element c (see Fig. 2 and the left-hand side of Fig. 6). Upon the axle end $d3$ of the right-and-left hand screw-threaded shaft d^5 is mounted the bored axle d^1 already mentioned, and this has been described and is shown as a long socket, which is screwed into the setting or slotted tube d and the said socket d^1 serves as a bearing for the actual axle end marked d^3. About such socket d^1 is a long sleeve i (made in two parts for ease of introduction) with central jaw and tooth interconnecting means. This long sleeve i is like a double gear wheel and comprises a gear wheel i^1 and a gear wheel i^2, the gear wheels i^1, i^2 being cut at the extremities of the compound sleeve i. The spur wheel h^3 gears with the spur wheel i^1 on the long sleeve i, said long sleeve i being mounted inside a casing j which is really a gear casing (and is well shown in Fig. 2), said gear casing j fitting the main bearing H mounted upon the upper carriage or slide element c. On the socket-like shaft d^1 is mounted a disc k with eccentric boss k^1, the disc having a small spur wheel k^2 mounted on a stud k^3, the stud being applied to the face of the disc k. The small spur wheel k^2 gears with an internal ring of teeth k^4 on the interior of the gear casing j. Upon the eccentric boss k^1 of the disc k is mounted a double spur wheel m with two rings m^1, m^2 of external teeth, the larger ring m^1 of teeth gearing with an internal ring of teeth m^3 on the gear casing j, the smaller ring of teeth m^2 gearing with an internal ring of teeth n^1 on a closing cap or sleeve n which is fixed on the socket-like shaft d^1. The socket-like shaft d^2 at the other end carries the eccentric g which fits the anchored sheath s. The eccentrics g, g are keyed or fixed upon the socket-like shafts d^1, d^2, as will be understood. The whole toothed gear structure above described constitutes an enclosed very slow motion gear.

It will be clearly understood the setting or slotted tube d communicates also the slow motion to the simple eccentric group at the gearing end and also to the eccentric g in anchored sheath at the non-gearing end, which is, in effect and as is clear from the drawings, mounted on the counter-part of the upper and lower carriages or slide elements c, b, with axle bearings, etc.

The slow motion gearing is one which provides for a very slow or gradual advancement and retraction of the grinder device e over a lengthened period, as it might be about 2 hours.

The drive for the axle (d^3 or d^4) of the right and left hand screw-threaded shaft d^5 of the traversing device can be effected by a chain wheel d^9 fixed on the axle end, such motion being transmitted through the described train of gearing back to the socket-like shaft d^1, the setting or slotted tube d and the eccentrics g, g, and the speed of the right and left hand screw-threaded shaft d^5 can be say 6 revolutions per minute, giving a 9 inch traverse per minute to the grinder device. The number of teeth in the gear wheels and the resulting time of advancement and retraction can be set down as thus.

In the example of epicyclic gear given, the lettered gear wheel h has 42 teeth, h^1 has 62 teeth, h^3 has 34 teeth, i^1 has 70 teeth, i^2 42 teeth, k^2 17 teeth, k^4 76 teeth, m^1 73 teeth, m^2 57 teeth, m^3 76 teeth, n^1 60 teeth.

The following equation is given as an example in connection with the grinding of a carding engine cylinder, and wherein the shaft d^3 or d^4 is driven at 6 revolutions per minute.

$$\frac{1}{6\times\frac{h\times h^3}{h^1\times i^1}\times\frac{i^2}{k^5+i^2}\times\left(\frac{n^1-m^2}{m^2}-\frac{m^3-m^1}{m^1}\right)\times 60}=$$

$$\frac{1}{6\times\frac{42\times 34}{62\times 70}\times\frac{42}{76+42}\times\left(\frac{60-57}{57}-\frac{76-73}{73}\right)\times 60}$$

=2 hours 3 minutes, being time of 1 revolution of eccentrics g in hours and minutes.

There is fixed to the closing cap or sleeve n of the gear group. an annular ring o which is externally graduated as shown more clearly by the Figs. 4 and 5, and the gear casing j is cut with external worm wheel teeth o^1. A shaft o^2 with operating handle o^3 is mounted in a support bracket o^4, and said shaft has a worm o^5, and there is a fixed pointer or indicator o^6. By operating the handle o^3 and worm gear, the gear case and all the gears can be turned to position the eccentrics g, g quickly to set the grinder device into any indicated initial position, whereby the relative starting position is known, or any desired advancement or retraction can be arranged for over a period.

The initial setting of the grinding device e, a slight depth between the teeth or dents of the wire on the cylinder, doffer, or the

like, is effected by operating the hand-wheels b^3, b^3, which obviously advance the lower carriages or slides b, b.

In operation of the mechanism or apparatus, when applied to the carding engine, the main cylinder or the doffer (as the case may be) may be driven at a slow speed through any suitable speed reducing gear, or from a counter-shaft, or otherwise. To make this more clear the Figs. 9 and 10 should be examined.

I show by Figs. 9 and 10, and merely by way of example, a simple speed reducing gear. This can, for the time being, replace the ordinary fast and loose pulley on main cylinder shaft t. This gear comprises a bush p applied on the main cylinder shaft t (after removal of the ordinary fast and loose pulleys), the bush p being held fast by adjustable studs p^1, p^1 in a jaw device p^2 embracing the bush p and fitting to a rib p^3 of the carding engine frame. On the bush p fits a pulley p^4 with a double gear wheel p^5, p^6, gear wheel p^5 engaging a fixed ring of teeth p^7 on the bush p. A bush p^8 is fixed on the main cylinder shaft t, and this has a ring of teeth p^9 with which mesh the teeth of gear wheel p^6. A loose pulley p^{10} is retained on the bush p^8 by the plate p^{11}. When the pulley p^4 is driven (in the opposite direction to the direction when carding) the main cylinder t^1 is driven at a suitable slow speed, say 6 revolutions per minute and in a reverse direction to normal driving. Upon the opposite end of the main cylinder shaft t is applied a removable sleeve q and chain wheel q^1, which, by a chain q^2, drives the chain wheel d^9 and so imparts a speed of 6 revolutions per minute to axle d^4 of the screw-threaded shaft d^5.

On the driven pulley p^4 is provided a V groove p^{12} which, by a provided link belt t^2, drives a grooved pulley e^4 fixed on the shaft e^2 whereby the shell e^1 of the traversible grinder device e is driven so as to rotate at about 800 revolutions per minute. Thus, as fully explained, the shell e^1 of the grinder device e is driven at 800 revolutions per minute, and the right and left hand screw-threaded shaft d^5 at 6 revolutions per minute to traverse the grinder device and to transmit motion through the described speed reducing gear to the eccentrics g, g, to very slowly advance and retract the revolving and reciprocating grinder device e with respect to the further insertion and withdrawal of the group of emery discs between the dents or teeth in the clothing on the main cylinder, doffer, or other revolving toothed body, to re-needle point said dents or teeth.

The Figs. 12 and 13 show the mechanism or apparatus applied to a carding engine and disposed for dealing either with the main cylinder or the doffer. In the latter case, a removable chain wheel u on the main cylinder shaft t drives by a chain u^1, a removable chain wheel u^2 on the doffer shaft u^3, on which doffer shaft u^3 is applied the removable sleeve q^x and chain wheel q^{1x} which, by a chain u^4, drives the chain wheel d^9 on the axle d^3 of the right and left hand screw-threaded shaft d^5. In this case also, a link belt t^{2x} drives from the grooved pulley p^{12} onto the grooved pulley e^4, as Figs. 12 and 13 show.

The apparatus is so constructed as to be easily applicable to either right or left hand carding engines, and to either end of such carding engines as described and shown, to serve for dealing with either main cylinder or doffer, and any modifications requisite as to applied mountings or adjuncts can be provided.

It is desirable to use a setting gauge for use in initially setting the emery discs of the grinding device e to the dents or teeth on the cylinder or doffer, because obviously the emery discs wear down with use, and this may take the form shown at Fig. 11. The device comprises a saddle r with projecting boss r^1 bored at two places, a spring-pressed plunger r^2 being fitted in one bore of the boss and capable of being held by a pinching screw r^3. The other bore is shaped to receive a round bar r^4 with gauge plate r^5 disposed at right-angles, the gauge plate r^5 being machined out $\frac{1}{16}$ of an inch at r^6 on the under face at one extremity, the under face of the other extremity working to the rounded end of the spring-pressed plunger r^2. In use, the saddle r is applied to the shell e^1 which supports the revolving traversing grinder device e, and the gauge plate r^5 is pressed to bear on the emery discs by overcoming the action of the spring, whereupon the plunger r^2 is pinched by the screw r^3, and the gauge plate r^5 removed, leaving the spring plunger r^2 locked. The adjustment of the revolving traversing grinder device e (by hand) is then effected between the dents or teeth until the rounded end of the plunger r^2 touches the dents or teeth f^1 (and this is done at each end of the tube e^1) whereupon the emery discs are accurately set and have penetrated about $\frac{1}{16}$ of an inch between the dents or teeth, which is a convenient distance to hand-set the grinder device e. The further slow automatic penetration and retraction is automatically effected by the mechanism or apparatus described.

The mechanism or apparatus ensures automatic entrance and withdrawal at a very slow uniform rate, and so the grinding effect is perfect and ensures a good finish without roughness. The movement in and out is perfectly parallel. The eccentrics g, g can be adjusted whilst the mechanism is running, and there is simple independent power of adjustment for hand setting. The gear gives unnoticeable advancement and withdrawal, and being entirely enclosed long wear is assured.

Further, the mechanism or apparatus is very compact, the vital parts are well enclosed, and with very slight changes in adjuncts, is applicable to different makes of carding engines, and its use enables effective re-needle pointing in situ of partly worn or inefficient clothing on cylinders, doffers, of carding engines, or other wire clothed rollers, etc.

I claim:

1. An apparatus for grinding or re-needle pointing in situ the dents or teeth of filleting or clothing on carding engine cylinders, doffers, and like cylindrical bodies, comprising a traversible grinder device, axles therefor, means to drive the same, bearing for the axles, movable slides for the bearings, hand adjusted slides and means to set the same, brackets on the movable slides, and a right and left hand screw-threaded shaft having its axle ends supported in said brackets on the movable slides, sleeve devices in the brackets, eccentrics and sheaths, anchorages for the sheaths, and a toothed gear slow motion for actuating said eccentrics to operate the movable slides to very slowly advance and retract the traversible grinder device between the dents or teeth of the filleting or clothing, and means to rotate the right and left hand screw-threaded shaft and an operative connection between same and the traversible grinder device.

2. An apparatus for grinding or re-needle pointing in situ the dents or teeth of filleting or clothing on carding engine cylinders, doffers, and like cylindrical bodies, having a traversible grinder device, axles therefor, means to drive the same, bearings for said axles, movable slides for the bearings, hand adjusted slides and means to set the same, cross-supports to carry the apparatus and to fit frame-work on the carding engine, brackets on the movable slides, and a right and left hand screw-threaded shaft with axle ends supported in said brackets on the movable slides, sleeve devices inside the brackets, eccentrics, and sheaths, anchorages for the sheaths, and a spur gearing slow motion located about one of said brackets and operative to actuate said eccentrics and consequently the movable slides to very slowing advance and retract the traversible grinder device between the dents or teeth of the filleting or clothing, and means to drive the right and left hand screw-threaded device, and an operative connection between the latter and the traversible grinder device, all for the purposes set forth.

3. An apparatus for grinding or re-needle pointing in situ the dents or teeth of filleting or clothing on carding engine cylinders, doffers, and like cylindrical bodies, having a traversible grinder device, axles therefor, means to drive the same, bearings for said axles, movable slides for the bearings, hand adjusted slides and means to set the same, cross-supports to carry the apparatus and adapted to fit the frame-work of a carding engine, brackets on the movable slides, and a right and left hand screw-threaded shaft with axle ends supported in said brackets on the movable slides, sleeve devices inside the brackets, eccentrics, and sheaths, anchorages for the sheaths, and a spur gearing slow motion located about one of said brackets and operative to actuate said eccentrics and consequently the movable slides to very slowly advance and retract the traversible grinder device between the dents or teeth of the filleting or clothing, said spur gearing slow motion having a gear casing, and a graduated indicator, and hand operated mechanism to turn said gear casing to rotate the gearing, there being also means to drive the right and left hand screw-threaded shaft and means interconnecting same with the traversible grinder device.

4. An apparatus for grinding or re-needle-pointing in situ the dents or teeth of filleting or clothing on carding engine cylinders, doffers and like cylindrical bodies, comprising traversible grinder device, a driven support therefor, bearings for the support, movable slides for said bearings, brackets upon said movable slides, bearings in the brackets, a right and left hand screw-threaded shaft, and means interconnecting the traversible grinder device and the right and left hand screw-threaded shaft, axle ends combined with the latter, sleeve devices about the axle ends, eccentrics about said sleeve devices, sheaths embracing the eccentrics, anchorages for the sheaths, and a toothed wheel speed reducing gear to slowly rotate the eccentrics within the anchored sheaths to operate the movable slides to very slowly advance and retract the traversible grinder device, and operative means to drive the right and left hand screw-threaded shaft, and supporting means comprising a cross-support, slides and hand adjusting mechanism for setting the apparatus to the dents or teeth on the cylinder, doffer or the like.

5. An apparatus for grinding or re-needle-pointing in situ the dents or teeth of filleting or clothing on carding engine cylinders, doffers and like cylindrical bodies, comprising traversible grinder device, a driven support and means to drive the same, bearings for the axles of the driven support, movable slides for said bearings, brackets upon said movable slides, and bearings in said brackets, a right and left hand screw-threaded shaft, means interconnecting the traversible grinder device and the right and left hand screw-threaded shaft, axle ends combined with the latter, sleeve devices about the axle ends, eccentrics about said sleeve devices, sheaths embracing the eccentrics, anchorages for the sheaths, a toothed wheel speed reducing gear

mechanism to slowly operate the two eccentrics within the anchored sheaths to very slowly advance and retract the traversible grinder device and operative means to drive the right and left hand screw-threaded shaft, and supporting brackets to which the sheaths are anchored, and lower slides, there being manually operated adjusting means for the lower slides for setting the apparatus to the dents or teeth on the cylinder, doffer or the like, and provision for encasing the toothed wheel speed reducing gear, a casing about the gear including means to operate or set the spur gear by hand, and indicating mechanism to indicate the amount of manipulation of the spur gear.

6. An apparatus for grinding or re-needle-pointing in situ the dents or teeth of filleting or clothing on carding engine cylinders, doffers, and like cylindrical bodies, comprising traversible grinder device, a support therefor, means by which same may be driven, axles for the support bearings for said axles, movable slides for said bearings, brackets upon said movable slides, bearing provision in the brackets, a right and left hand screw-threaded shaft, and means interconnecting the traversible grinder device and the right and left hand screw-threaded shaft, axle ends combined with the latter, sleeve devices about the axle ends, eccentrics about said sleeve devices, and sheaths, said eccentrics co-operating with said sheaths, anchoring means for the sheaths, lower slides, brackets thereon for the anchoring means, hand operated means to adjust the lower slides, and a lateral support to fit the carding engine frame, and toothed gear mechanism disposed around the axis of one end of the right and left hand screw-threaded device and about one of the brackets and adapted to operate the eccentrics to very slowly advance and retract the traversible grinder device between the dents or teeth of the clothing on the cylinder or the like to be treated, and means to drive the right and left hand screw-threaded shaft.

7. Means for grinding or re-needle-pointing in situ the dents or teeth of filleting or clothing on carding engine cylinders, doffers and like cylindrical bodies, comprising traversible grinder device, a support capable of being driven, axles for the support, bearings for the axles of said support, movable slides for said bearings, brackets upon said movable slides, bearings in said brackets, a right and left hand screw-threaded shaft, means interconnecting the traversible grinder device and the right and left hand screw-threaded shaft, axle ends combined with the latter, sleeve devices about the axle ends, eccentrics about said sleeve devices, sheaths embracing the eccentrics, anchorages for the sheaths, a speed reducing gear located about a bracket on one hand of the apparatus operating to very slowly turn the two eccentrics within the anchored sheaths to very slowly advance and retract the traversible grinder device, and operative means to drive the right and left hand screw-threaded shaft, and the support for the traversible grinder device, and means to drive the main cylinder of a carding engine at a slow speed, and means to drive the other operative parts from said carding engine, for the purposes described.

8. Means for grinding or re-needle-pointing in situ the dents or teeth of filleting or clothing on carding engine cylinders, doffers, and like cylindrical bodies, comprising traversible grinder device, a support capable of being driven, axles for said support, bearings for said axles, movable slides for said bearings, brackets upon said movable slides, bearings in said brackets, a right and left hand screw-threaded shaft, means interconnecting the traversible grinder device and the right and left hand screw-threaded shaft, axle ends combined with the latter, sleeve devices about the axle ends, eccentrics about said sleeve devices, sheaths embracing the eccentrics, anchorages for the sheaths, a toothed wheel speed reducing gear located about the bracket on one hand of the apparatus and operative to very slowly turn the two eccentrics, a casing about the gear, and a movable graduated scale, and hand-operated mechanism to rotate the casing about the gear, and a pointer, and operative means to drive the rotatable elements from the carding engine.

In testimony whereof I have signed my name to this specification.

JAMES DRONSFIELD.