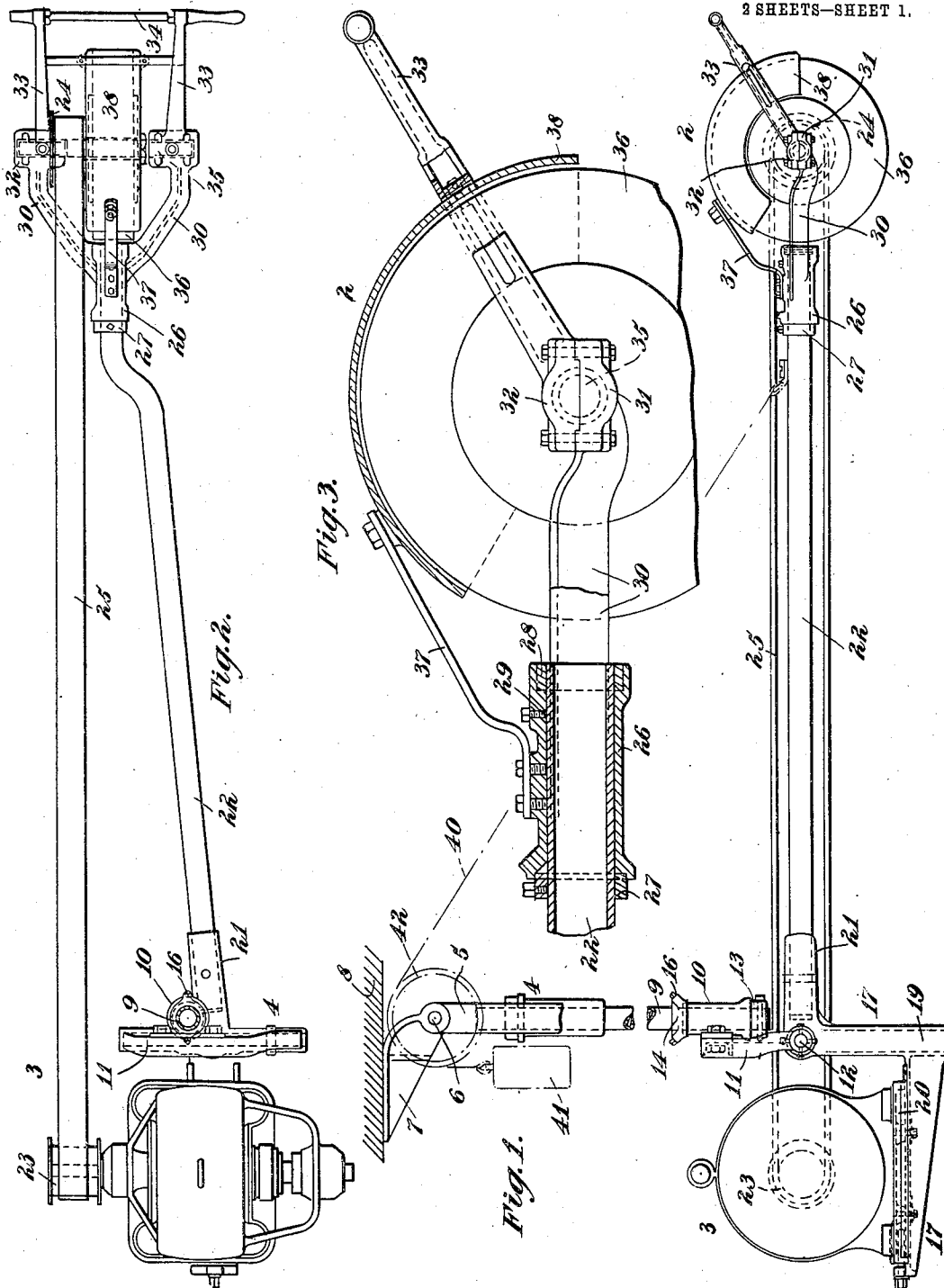


M. F. APGAR.
SWINGING GRINDER.
APPLICATION FILED MAR. 6, 1909.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 1.

955,626.



Witnesses:

Skuman
H. O. Penney

Inventor:

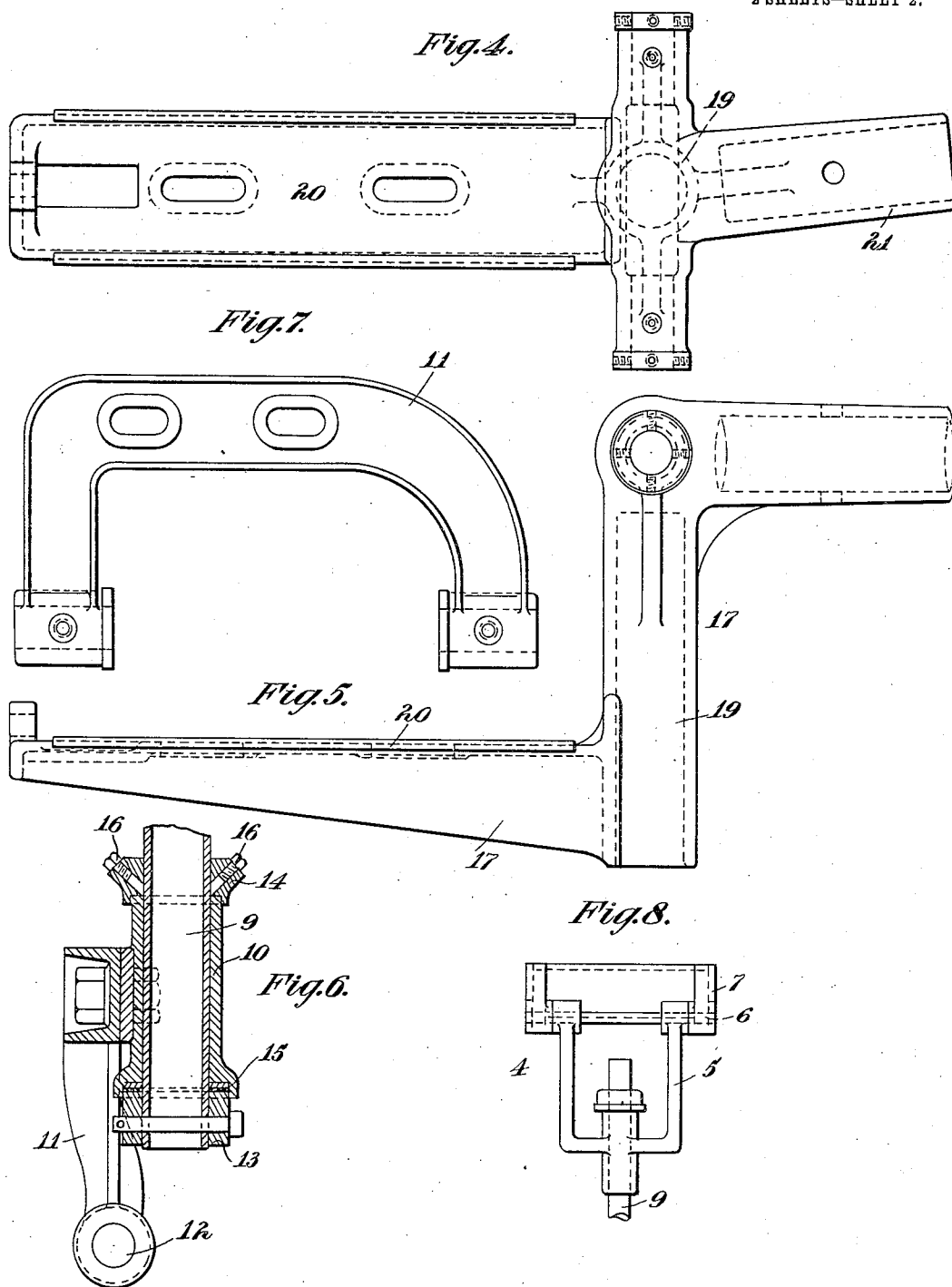
Marshall F. Apgar
By his Attorney, *F. H. Richards*

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UNITED STATES PATENT OFFICE.

MARSHALL F. APGAR, OF HIGH BRIDGE, NEW JERSEY, ASSIGNOR TO TAYLOR IRON & STEEL COMPANY, OF HIGH BRIDGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SWINGING GRINDER.

955,626.

Specification of Letters Patent.

Patented Apr. 19, 1910.

Application filed March 6, 1909. Serial No. 481,778.

To all whom it may concern:

Be it known that I, MARSHALL F. APGAR, a citizen of the United States, residing in High Bridge, in the county of Hunterdon and State of New Jersey, have invented certain new and useful Improvements in Swinging Grinders, of which the following is a specification.

This invention relates to grinding machines, and more particularly to swinging grinders, the object of the invention being to provide an improved swinging grinder comparatively simple in construction, but so organized that it is easily manipulated, and which will enable the grinding wheel thereof to be swung into any desired position relative to the work by the operator, whereby it is universally adjustable, and in which also the grinding wheel will be so counterbalanced, either by the driving means therefor or otherwise, that the weight of such grinding wheel will not interfere with the manipulation thereof into any position to which it may be found desirable to quickly swing it. In the drawings accompanying and forming part of this specification, Figure 1 is a side elevation of this improved swinging grinder, with the perpendicular supporting means partly broken away, and showing in dotted lines one means of counterbalancing the grinder; Fig. 2 is a top view thereof, with the supporting means shown in section; Fig. 3 is an enlarged partly sectional view of the grinding wheel end of the grinder; Fig. 4 is a detail plan view of the supporting means for the motor; Fig. 5 is a side view of the parts shown in Fig. 4; Fig. 6 is a detail sectional view of the connection between the perpendicular supporting means and the motor platform supporting means; Fig. 7 is a view of the yoke looking from left to right in Fig. 6; and Fig. 8 is a view of the overhanging yoke for the depending spindle.

Similar characters of reference indicate corresponding parts throughout the different figures of the drawings.

In the embodiment shown this improved swinging grinder comprises, in a general way, a grinding mechanism 2 and a driving mechanism 3 supported relatively remote one from the other and in such positions with relation to each other and to their support that the motor may be used if desired to counterbalance the grinding mech-

anism, these two mechanisms being carried by a supporting means 4 adapted to be connected to an overhanging support or ceiling, the several parts being so organized that the grinding wheel may have a swinging movement in a vertical plane with the motor, a swinging movement in a horizontal plane with the motor, a back-and-forth movement with the motor, and a movement in a circular direction independent of the motor.

In the preferred form shown, the supporting means 4 for the grinder and motor mechanism may comprise a yoke 5 pivotally attached by means of a pivot rod or pivot 6 with a hanger 7 adapted for attachment to a ceiling 8 or other overhanging support. By this pivotal connection between the yoke and hanger the yoke and the mechanism carried thereby will have a swinging movement relatively to its overhanging support. Swiveled in this yoke is a depending spindle 9 having suitable means, as a collar, for securing it to the yoke. On the lower end of this spindle is loosely mounted a sleeve 10 to projections at the sides of which is bolted a yoke 11 carrying a pivot rod or spindle 12 for supporting the grinding and motor mechanisms. The sleeve 10 is maintained in position by a pair of collars 13 and 14, both secured to the spindle 9, the sleeve 10 having a flange encircling the collar 13 while the collar 14 has a flange encircling the sleeve 10. By this construction the spindle 9 can have a rotary or swivel movement relatively to the sleeve 10. Between the collar 13 and the sleeve, and within the flange thereof, may be located a suitable packing 15. The collar 14 is provided with oil inlets 16. By this construction the mechanisms supported by the spindle can have a swinging movement in a horizontal plane.

The supporting means for the grinding and motor mechanisms comprises a bracket 17 mounted on the pivot 12 of the yoke 11 for swinging movement relatively thereto. This bracket comprises a depending portion 19 having a rearwardly extending platform 20 on which the motor is bolted. The bracket also has a forwardly extending tubular portion 21 for the reception of the supporting arm 22 of the grinding wheel. This supporting arm or rod 22 is preferably bent at its outer end so as to bring the driving

wheel 23 of the motor into alinement with the driven wheel 24 of the grinding wheel, these two wheels being connected by a suitable belt 25. The outer end of this arm 22, which may be in the form of a tube if preferred, has loosely mounted thereon a sleeve 26, being secured against endwise play by means of a pair of collars 27 and 28 fastened to the supporting arm 22 with suitable means, as at 29, for insuring a properly lubricated joint. By this means it will be observed that the sleeve is rotatable upon the supporting arm 22. Projecting from each side of the sleeve is a pair of arms 30 forming with such sleeve a yoke for supporting the grinding wheel of the grinding mechanism. Each of these arms 30 terminates at its free end in a bearing member 31, the other half or cap 32 of each of which is carried by arms 33 secured to a suitable handle or cross bar 34. By this means it will be seen that the handle and its arm may be readily detached and thus permit the grinding wheel 36 to be detached from its supporting arm.

Secured to the yoke sleeve 26 is a bracket 37 for supporting a shield 38 over the upper portion of the grinding wheel, thereby to protect the operator.

In the improved swinging grinder shown, the operator, on grasping the handles, can swing the grinder backward and forward in substantially a horizontal plane toward and from the work on the pivotal connection 6 with the overhanging support. He can also swing the grinder sidewise or in a horizontal plane on the swivel connection or sleeve 10. In addition, he can also swing the grinder on the pivotal connection 12 upward or downward, or in a vertical plane, and also adjust or rotate the grinder by means of the swivel connection or sleeve 26 on its supporting arm 22, so that in the present improvement there is provided a universally adjustable grinder, and not only this, but such a grinder that the weight thereof is wholly or partially counterbalanced by the motor, so that this universal adjustment of it is easily obtained.

In those cases where it is undesirable to make the platform supporting the motor of such length that the motor may be used to entirely counterbalance the grinding wheel, a weight may be used in addition to the weight of the motor for accomplishing this purpose. In Fig. 1 the dotted lines illustrate how a weight 41 may be connected by connecting means, such as a rope 40 running over a pulley 42, with the grinder supporting arm, thereby to maintain the weight of the counterbalancing means when it is desired to have the motor close to the depending supporting spindle. Of course the weight may be supported in any other manner if preferred. In practice the motor may

be adjusted upon its supporting platform 17, thereby to adjust the tension of the belt. It will also be observed that the joints between the several connecting members are so designed that they are dust proof. Furthermore, the shield over the grinding wheel may be made adjustable to permit the use of various diameters of wheels.

In practice should it be desired to do internal grinding, the handle 34, together with the caps thereto attached, may be reversed to bring the handle into position to project toward the motor and thus not interfere with the grinding wheel when, as stated, it is desired to do internal grinding.

I claim as my invention:

1. In a machine of the class specified, the combination of swinging supporting means, a yoke rotatably attached thereto, each end thereof being formed into one member of a bearing, a grinding wheel provided with a shaft supported by said bearings, and a handle for swinging said grinding wheel having a pair of ends, said ends being formed into caps for the said bearings.

2. In a machine of the class specified, the combination of a yoke pivotally secured to an overhanging support, a spindle and sleeve one rotatable relatively to the other and secured to said yoke, a yoke connected to said sleeve, a motor support pivotally connected to said last mentioned yoke and provided with a motor platform below the pivotal connection of said support with the yoke, a motor carried by said support rearwardly of said yoke, a supporting arm carried by said motor support in front of said yoke, a yoke rotatably secured to said supporting arm, a grinding wheel supported by said last mentioned yoke, and driving means connecting the motor with the grinding wheel, the axis of the motor, the pivot of the support and the grinding wheel lying normally in substantially the same plane.

3. In a machine of the class specified, the combination of depending supporting means, horizontal supporting means pivotally connected to said depending supporting means, a motor carried by said horizontal supporting means at one side of the depending supporting means, a grinder carried by said horizontal supporting means at the other side thereof, and means for adjusting the positions of the grinder and motor relative to the depending supporting means to the end that one may counterbalance the other.

4. In a machine of the class specified, the combination of a depending support, a horizontal support pivotally connected thereto, a grinder mounted on the depending support, and a motor also mounted on the horizontal support with a part of the motor below the axis of the motor and located in position for bringing the axis thereof on a plane with that of the grinder and support.

5. In a machine of the class specified, the combination of a depending support, a member pivotally connected thereto and embodying a horizontal support, a grinder supported by said member, and a motor also supported thereby with a part mounted on the horizontal support of the motor below the axis of the pivot, the motor being located at one end side of the depending support and the grinder at the other side thereof and relatively remotely apart to the end that one will counterbalance the other. 10

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Witnesses:

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