

1,065,868.

2 SHEETS—SHEET 1.



N. A. S. S. S. S.
C. M. Gellert

B. M. W. Hanson
By his Attorneys,

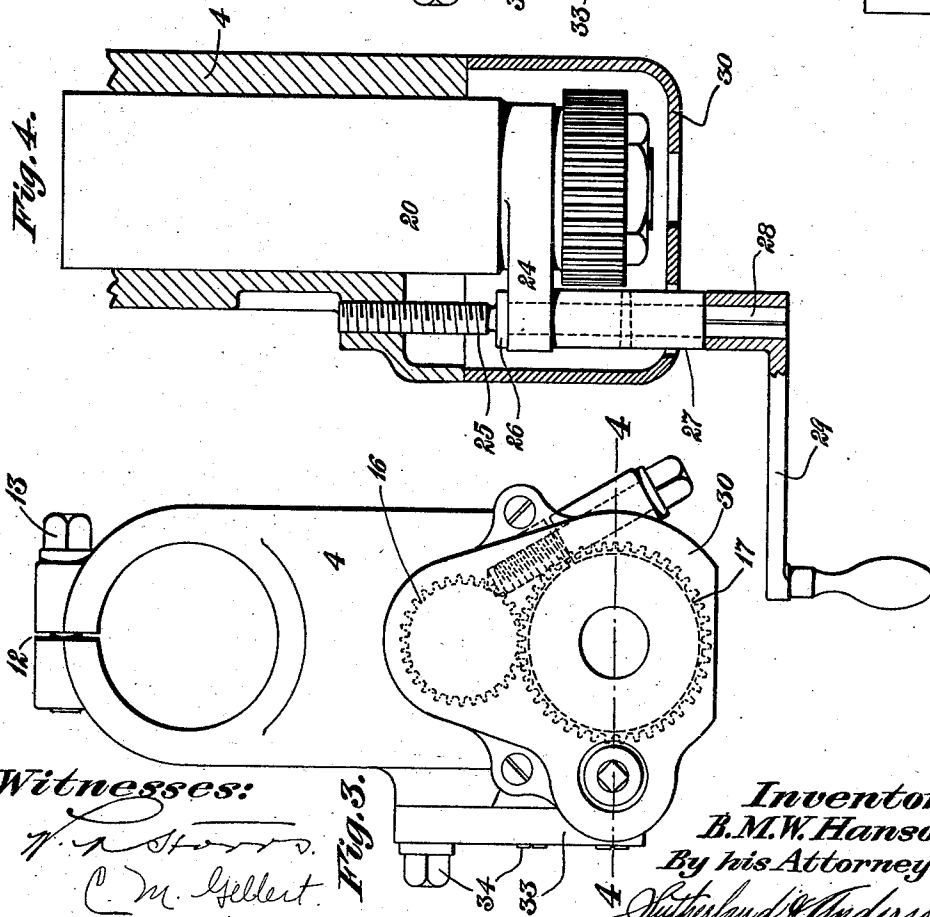
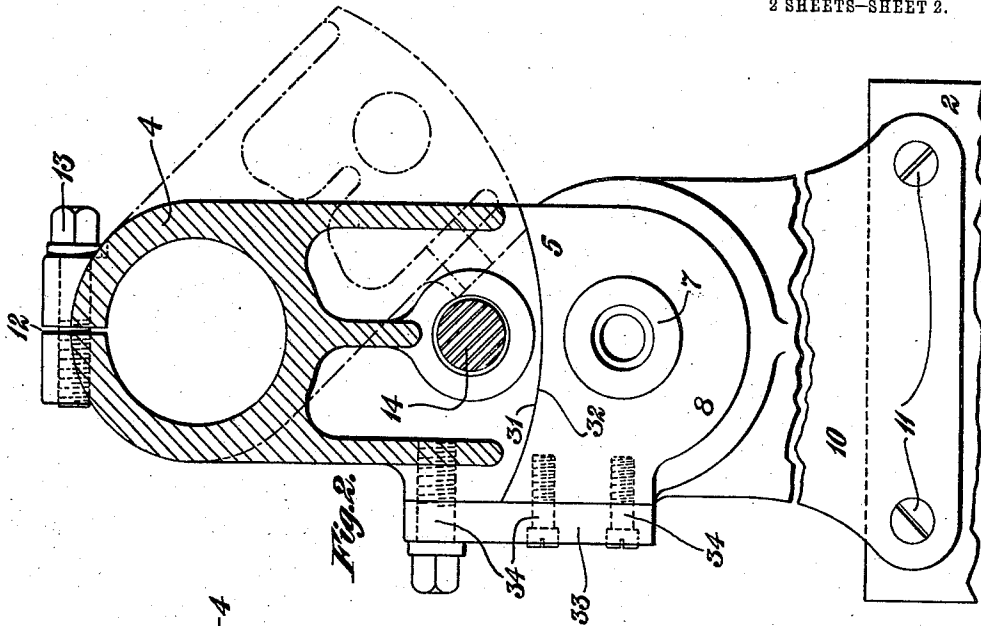
By his Attorneys,
Sutherland & Hudson.

B. M. W. HANSON.
ATTACHMENT FOR MILLING MACHINES.
APPLICATION FILED AUG. 9, 1911.

1,065,868.

Patented June 24, 1913.

2 SHEETS—SHEET 2.



Witnesses:

J. A. Harris
C. M. Gilbert

Fig. 3.

Inventor:
B. M. W. Hanson
By his Attorneys,
Butterland & Anderson

UNITED STATES PATENT OFFICE.

BENGT M. W. HANSON, OF HARTFORD, CONNECTICUT, ASSIGNOR TO PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

ATTACHMENT FOR MILLING-MACHINES.

1,065,868.

Specification of Letters Patent.

Patented June 24, 1913.

Application filed August 9, 1911. Serial No. 643,133.

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Attachments for Milling-Machines, of which the following is a specification.

This invention relates to what I shall for convenience term "an attachment for milling machines" in that the device in its preferred form is adapted for detachable connection with such a machine; it is conceivable that it or at least some of the parts thereof, might form a permanent part of such a machine.

One of the primary purposes of the invention is to provide an appliance of the character noted by which a plurality of tools can be utilized to operate simultaneously upon work.

Another point in view is the provision of an attachment when employed as such which can be quickly and easily mounted upon or dismounted from milling machines of various types.

A further object is the provision of means whereby the tools can be readily applied.

The device includes further objects and advantages which with the foregoing will be set forth at length in the following description wherein I will outline in full that form of embodiment of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification, the principal purpose of this disclosure being to enable those skilled in the metal working art, to practise the invention. From such observations it will be evident that I do not restrict myself to such showing; I may depart therefrom in several respects within the scope of the invention covered in the claims following said description.

Referring to said drawings, Figure 1 is a vertical section of the upper portion of a milling machine equipped with an attachment comprising my invention. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is an end elevation of the principal members of the attachment, and, Fig. 4 is a horizontal section on the line 4—4 of Fig. 3.

Like characters refer to like parts throughout the several figures.

At the outset I desire to make it clear

that my invention may be incorporated in a device which forms either a removable or a permanent part of a milling or equivalent metal working machine although in the organization illustrated said device is in the nature of an attachment which is adapted for connection with any standard milling or similar machine. In Fig. 1 of the drawings I have shown a portion of such a machine; in fact only enough thereof to illustrate the nature and purposes of the attachment, such portion being the upper part of the column 2 and what is known as the "overhanging arm" 3. In the present instance the shank of this overhanging arm constitutes a convenient support for the main or principal member 4 of the attachment, the secondary or auxiliary member of the attachment being denoted by 5. These two members 4 and 5 present in effect the framework or body of the attachment being preferably under normal conditions, rigidly connected together.

As already intimated a milling machine provided with my attachment, is furnished with two tools one carried by the machine proper and the other by the attachment and although I do not limit myself to any particular disposition of these tools or cutters they rotate generally about parallel axes and are opposite; they are also usually operatively connected. Therefore they can operate simultaneously upon opposite sides of the work of whatever kind the same may be; hence their thrusts are practically neutralized.

The tool carried by the machine proper is designated by 6 and its spindle by 7 the latter being rotatively supported by suitable bearings upon the column 2 and being driven by any convenient means all as quite common in this art. The auxiliary member 5 of the attachment has a guard portion 8 housing the pinion 9, and a pendent portion 10 fastened by a screw or screws as 11 to the front face of the column 2, the guard portion 8 having an opening for the cutter spindle 7 to which the pinion 9 is keyed or otherwise suitably connected. The motion of the spindle 7 is transferred through suitable means to a second tool spindle hereinafter described and in the construction shown the pinion 9 forms a part of the power-transferring means. The member 4 has its upper side divided or split as at 12

for the passage of the shank portion of the overhanging arm 3, and is furnished with one or more clamping screws 13 by which said part 4 can be normally clamped to the shank portion of said arm 3. By loosening these screws the said member 4 can be turned on said shank portion as a pivot to effect as will hereinafter appear the application of the tool or tools following which the said member 4 will be returned to its proper position and the clamping screws 13 set. The member 4 serves as a support for the elongated shaft 14 to which at the inner end thereof, the pinion 15 is rigidly connected, said pinion being in mesh with the pinion 9 to which reference has hereinbefore been made. Said shaft 14 rigidly carries at or near its forward end, the barrel pinion 16 in constant mesh with the pinion 17 rotatively connected as will hereinafter appear, with the cutting tool 18. As shown the pinion 17 is keyed to the spindle 19 surrounded by a bearing sleeve 20 fitted in a bore or opening in the member 4, for sliding movement in the direction of its length for a purpose that will be hereinafter pointed out. The spindle 19 has at its inner end a collar 21 between which and the bearing sleeve 20 the washer 22 is disposed. Between the opposite end of the sleeve 20 and the pinion 17 a washer 23 is situated. It therefore follows that when the sleeve 20 is longitudinally adjusted a similar result follows with respect to the spindle 19 by virtue of which the tool 18 can be moved toward or from the companion tool 6. It might be explained that the shanks of the two tools are tapered to fit tapered sockets in the respective spindles as common.

While any suitable means may be provided for longitudinally adjusting the sleeve 20 and hence the spindle 19 that now to be described has been found satisfactory. The sleeve 20 is shown provided with an offset or projection 24 in which the plain portion of the adjusting-screw 25 turns, the threaded portion of said screw being tapped or threaded into the member 4. Integral with said screw 25 is a collar 26 at one side of the offset 24, the long collar 27 surrounding said screw at the opposite side of said offset and being pinned or otherwise suitably connected to said screw. It follows that when the screw 25 is turned, the sleeve 20 and consequently the spindle 19 will be longitudinally adjusted so as to position the tool 18 relatively to the complementary tool 6. The outer end of the screw 25 may be squared as at 28 to removably receive a wrench or operating lever or handle 29. The member 4 is shown provided at its outer side with a guard or cap 30 attached thereto by screws or otherwise and inclosing the gears 16 and 17 and adjacent parts. The

said guard also has a hole for the passage of the screw 25.

The two members 4 and 5 preferably fit solidly against each other and in addition are also firmly connected by suitable means as will hereinafter appear. As shown the lower portion of the member 4 has a convex face 31 bearing against the concave face 32 of the lower member 5, the engagement between these two parts being preferably a firm one. When the members 4 and 5 are in proper or working relation in the construction shown the axes of the two cutters should be coincident and to maintain this relation the plate 33 and several screws all denoted by 34, may be provided said plate fitting flatwise against the two members 4 and 5 and being held substantially thereagainst by the said screws 34 which are tapped into said parts 4 and 5. As shown two of said screws 34 are threaded into the lower member 5 while a single screw is tapped into the upper or principal member. I should state at this point that the arcs of the convex and concave engaging faces 31 and 32 are struck from the center of motion of the member 4 or the longitudinal axis of the shank portion of the member 3. It will be assumed that the several clamping screws 13 are set up, after the tools 6 and 18 have been properly positioned and that the screws 34 are all driven home. This is the normal relation. To mill the work it is placed in proper position with respect to the milling cutters and power being applied to the spindle 7 the cutter 6 will be rotated. Owing to the connections described between the spindles 7 and 19 it follows that the tool 18 will be simultaneously rotated. It will be supposed that it is desired to remove the tools. To do this the upper screw 34 is removed so that the two members 4 and 5 will be disconnected following which the upper member can be swung outward to an extent sufficient to permit the free removal of the shanks of the two tools after which new tools can be put in their places and the member 4 returned to its original position as already set forth, it being understood that before the member 4 can be swung out it is necessary to release the clamping screws 13 also the clamping device at the end of arm 3 which consists of a plate 36 and screw 37.

What I claim is:

1. A milling machine comprising a framing, a main spindle constituting a permanent part of said machine, an overhanging arm on said framing, a member detachably supported by said overhanging arm, means below said detachably mounted member for sustaining the same, means for holding said detachably mounted member against movement, an auxiliary spindle carried by said detachably mounted member and coaxial with the main spindle when said detach-

ably mounted member is held against movement, tools rotative with the respective spindles and facing each other when the spindles are coaxial, and means for rotating the
5 two spindles together.

2. A milling machine comprising a framing, a spindle constituting a permanent part of said machine, an overhanging arm, a detachably mounted member supported for
10 swinging movement by said overhanging arm, a device for upholding said detachably mounted member, said upholding device and detachably mounted member having engaging faces formed on an arc struck from the
15 center of movement of said detachably mounted member, means for fixing said de-

tachably mounted member against movement, an auxiliary spindle supported by said detachably mounted member and coaxial with the main spindle when said detach- 20
ably mounted member is held against movement, tools rotative with the spindles and facing each other when said spindles are coaxial, and mechanism for rotating the
25 auxiliary spindle by and on the rotation of the main spindle.

In testimony whereof I affix my signature in presence of two witnesses.

BENGT M. W. HANSON.

Witnesses:

W. M. STORRS,
C. M. GELLERT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."