

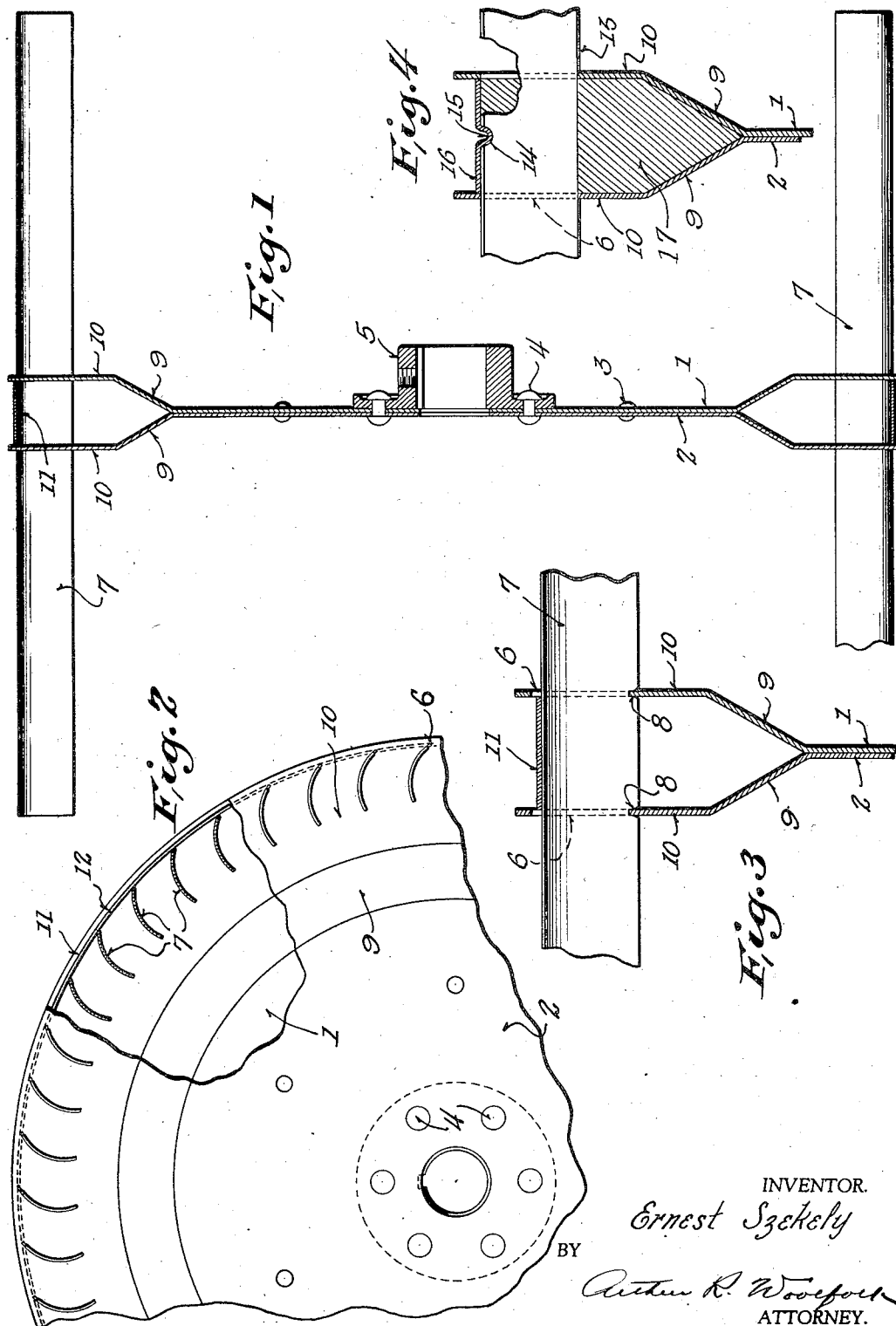
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ROTOR FOR A BLOWER

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ROTOR FOR A BLOWER

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This invention relates to a rotor for a blower or similar device.

Objects of this invention are to provide a novel form of rotor for a blower which is so made that stampings may be employed for practically the entire structure, and in which these stampings are of simple construction and may be easily produced.

Further objects are to provide a fabricated rotor which is so made that extreme rigidity is obtained so that although the rotor is formed of separate parts, there is no possibility of loosening of the parts or of lack of aligning or lack of balance occurring during use.

Further objects are to provide a construction of rotor which is such that the rotor may be made for a double inlet type of blower or for a single inlet type of blower without any fundamental change in the construction of the parts, the stampings, however, remaining the same but being cut at different lengths.

Further objects are to provide a construction such that not only strength against centrifugal forces is provided but also lateral stability and firmness is assured, although the blades are of the cantilever type.

The invention also has for its further object to provide a construction in which novel means is employed for locking the blades in place so that all of the blades may be simultaneously locked in place in a very simple manner and with security, and in a certain form that the invention may take to provide additional locking means which also acts in the capacity of a flywheel, or, in other words, as a mass symmetrically concentrated adjacent the peripheral portion of the rotor so that the rotor may serve in the double capacity as a rotor for a blower with firmly anchored blades and also as a flywheel if such is desired.

In greater detail, objects of this invention are to provide a rotor for a blower in which the parts are so formed that two main stampings identical but reversely pressed out are employed and are die formed and punched to provide symmetrically and accurately arranged slots or holes adjacent the periphery with exact spacing between each slot, the slots serving to receive and thereby position the stamped rotor blades, which may be and preferably are of curved cross-section, all of the blades being held together in a very simple manner by means of a banding strap with the ends drawn tightly together and welded or otherwise secured, the blades themselves being so formed that they cooperate with other portions of the de-

vice to accurately position the blades and hold the blades against shifting longitudinally of the blades.

Further objects are to provide a construction which may be very rapidly produced and quickly assembled and which is economical to make and which does not depend for its accuracy of construction upon the skill of the workman, but instead inherently results in an accurately formed blower rotor.

Embodiments of the invention are shown in the accompanying drawing, in which:

Figure 1 is a sectional view through the rotor with parts broken away and with parts in section.

Figure 2 is a fragmentary side elevation of the rotor with parts broken away and in section.

Figure 3 is an enlarged view of a fragment of the rotor.

Figure 4 is a view corresponding to Figure 3 showing a further form of the invention.

Referring to the drawing, it will be seen that the rotor for the blade consists of two main circular disks or plates 1 and 2 which are identical except that they are reversed. They are formed from the same die and are punched to receive a series of rivets such as indicated at 3 and the rivets 4 which hold the hub 5 in place. The invention, however, in its broadest aspects is not limited to this particular mode of securing the parts together, as they obviously can be spot welded instead of being riveted if desired, or any other suitable means of attaching the plates together could be employed.

In forming the plates, they are punched with a series of curved slots or holes 6 as may be seen most clearly from Figures 2 and 3, and these curved slots are arranged opposite each other when the two disks are put together, as shown in Figures 1 and 2. The curved slots receive the curved blades 7 which are positioned by merely slipping them laterally through the slots. These blades are each provided with a pair of notches 8, see Figure 3, which allow the blade to seat on the rotor disks 1 and 2.

In order to get lateral stability, the rotor blades are dished, preferably adjacent their periphery. For example, a slanting portion 9 may be provided which is followed by a peripheral straight portion 10, the straight portion having the slots 6. This provides laterally spaced bearing points for each of the blades and prevents them from rocking, though these blades are of the cantilever type. The notches 8 correctly position the blades

and prevent them from shifting longitudinally of the blade or laterally of the rotor.

In order to hold the blades in place and align the rotor disks, a sheet metal band 11 is drawn tightly around the blades and is wedged between the portions 10 of the rotor, thus acting to accurately align the rotor and bind the blades in place. The ends of the band are welded, as indicated at 12, or may be secured in any suitable manner so long as a firm joint is obtained.

The banding strap 11 thus simultaneously holds all of the blades in their locked position and prevents shifting thereof and, the banding strap being cut straight, perfectly aligns the rotor disks.

The accuracy of the construction, it will be seen, is independent of the skill of the workman as the blades definitely assume their predetermined correct spaced position symmetrically about the rotor and are held in this correct position against subsequent shifting.

Figure 4 shows a different form of the invention and illustrates a different manner in which the blades may be locked against shifting laterally of the rotor. In this form of the invention, the rotor disks 1 and 2 are provided with the slots 6 in identically the same manner as that previously described. However, the blades 13 are not provided with pairs of notches which engage the rotor disks. Instead each blade is provided with a notch 14 on its outer edge which receives an inwardly pressed rib 15 formed in the banding strap 16 and thus the blades are locked against shifting longitudinally of the blade or laterally of the rotor.

The blades in this case contact with both the inner and outer margins of the slots 6, as distinguished from the form of the invention shown in detail in Figure 3.

Additionally, the space between the portions 9 and 10 of the rotor disks may be filled with cast aluminum or Babbitt metal 17. It is also preferable to clean and treat the adjacent portion of the rotor and the blades so that the Babbitt metal or other material will bond or adhere to the parts.

The metal may be poured into the cavity between the parts 9 and 10 of the rotor disks through an aperture, not shown, formed at any suitable point, preferably in one of the rotor disks.

It will be seen that when the metal rim is formed by pouring molten metal into the peripheral space, that it forms an additional means for locking the blades against displacement and also provides a flywheel effect as it concentrates a mass of metal adjacent the periphery of the rotor and thus provides maximum flywheel effect for minimum weight.

It is obvious that the device can be made either for a double inlet type of blower, which is the form of rotor shown in the drawing, or may be made for a single inlet type of blower by merely omitting one of the overhanging arms of each blade.

Additionally, the rotor has great flexibility in design as the blades may be cut off at any desired length providing shorter blades for a blower having a lesser capacity or longer blades for a blower of greater capacity, thus providing maximum flexibility in construction without changing any of the dies. This is an important point in the manufacture of rotors for blowers, as it provides this necessary flexibility in design to

meet different requirements or different capacities without changing any of the dies.

It will be seen that the construction is such that absolute accuracy is assured independently of the skill of the workman, and that the blades are anchored in place without the use of a multiplicity of rivets, bolts, or other means, but that instead the utmost simplicity is obtained.

It is within the province of this invention to tack weld each of the blades to one or both of the rotor disks if so desired. Also it is apparent that the particular manner of locking the blades against displacement shown in Figures 3 and 4 may be used either with or without a metal filled peripheral portion. Also it is obvious that if desired, the notched type of blade could be dispensed with and the Babbitt or other filling metal could be relied upon solely for locking the blades to the rotor and at the same time securing the flywheel effect.

Although this invention has been described in considerable detail, it is to be understood that such description is intended as illustrative rather than limiting, as the invention may be variously embodied and is to be interpreted as claimed.

I claim:

1. A rotor for a blower comprising a body portion formed of two disks each having a series of slots formed therein adjacent the peripheral portion and in a symmetrical manner about the center of said body portion, a plurality of blades extending through the said slots, and means independent of said disks and directly engaging said blades for locking the blades to the body portion.
2. A rotor for a blower comprising a body portion formed of two stampings having slots arranged symmetrically about their peripheral portions, a plurality of stamped blades corresponding in shape to the said slots and extending through the slots, and means independent of said stampings and directly engaging said blades for securely locking the blades to the body portion.
3. A rotor for a blower comprising a body portion having two stamped disks with outwardly divergent peripheral portions, said disks having curved slots arranged in alignment and in their peripheral portions, a plurality of curved stamped blades passing through the slots in said disks and supported by said disks at laterally spaced points with reference to the central plane of the body portion, said blades having cut away portions providing shoulders in interlocking engagement with said disks, and a banding strap extending around outside of and contacting with said blades for holding said blades in place with the said shoulders in interlocking engagement with said disks.
4. A rotor for a blower comprising a body portion having two stamped disks with outwardly divergent peripheral portions, said disks having curved slots arranged in alignment and in their peripheral portions, a plurality of curved stamped blades passing through the slots in said disks and supported by said disks at laterally spaced points with reference to the central plane of the body portion, and a banding strap extending around outside of and contacting with said blades for holding said blades in place, said blades having notches formed on their inner sides interlocked with said disks.
5. A rotor for a blower comprising a body portion having two stamped disks with outwardly divergent peripheral portions, said disks having

curved slots arranged in alignment and in their peripheral portions, a plurality of curved stamped blades passing through the slots in said disks and supported by said disks at laterally spaced points with reference to the central plane of the body portion, and a banding strap extending around outside of and contacting with said blades for holding said blades in place, said blades having notches on their outer sides and said banding strap having a depressed portion interlocking with said notches.

6. A rotor for a blower comprising a body portion having two stamped disks with outwardly divergent peripheral portions, said disks having curved slots arranged in alignment and in their peripheral portions, a plurality of curved stamped blades passing through the slots in said disks and supported by said disks at laterally spaced points with reference to the central plane of the body portion, and a banding strap extending around outside of and contacting with said blades for holding said blades in place, said blades having notches on their outer sides and said banding strap having a depressed portion interlocking with said notches, said banding strap being positioned between the peripheral portions of said disks.

7. A rotor for a blower comprising a pair of stamped disks having divergent peripheral portions leaving a space between said portions, said peripheral portions having slots formed therein, a plurality of blades passing through said slots, said blades having cut away portions providing shoulders in interlocking engagement with said disks, a cast metal filler filling the space between the peripheral portions of the disks, and banding means holding said blades in interlocking engagement with said disks.

8. A rotor for a blower comprising a pair of circular disks having divergent peripheral portions forming an annular channel, said peripheral portions having curved aligning slots, a plurality of stamped curved blades extending through said slots, said slots being closed at their inner and outer ends and said disks having marginal portions projecting beyond said slots, said blades having cut away portions providing shoulders in interlocking engagement with said disks, and a banding strap located between said marginal portions and tightly binding against said blades and

holding said blades in interlocking engagement with said disks.

9. A rotor for a blower comprising a pair of stamped disks having divergent peripheral portions provided with aligning curved slots, a plurality of blades extending through said slots and having notches interlocking with said peripheral portions, and a banding strap binding against said blades and holding the notches in said blades in interlocking engagement with the peripheral portions of said disks.

10. A rotor for a blower comprising a pair of stamped disks having divergent peripheral portions provided with aligning curved slots, a plurality of curved stamped blades extending through said slots, a banding strap located between said peripheral portions and binding against the outer edges of said blades, said banding strap and said blades having interlocking means, and a cast metal filler located within the peripheral portion and engaging the inner side of said peripheral portion, said blades and said banding strap.

11. A rotor for a blower comprising a body portion having two stamped disks with outwardly divergent peripheral portions, said disks having curved slots arranged in alignment and in their peripheral portions, a plurality of curved stamped blades passing through the slots in said disks and supported by said disks at laterally spaced points with reference to the central plane of the body portion, said blades being wider between said disks than in the planes of said disks for interlocking engagement with said disks, and a banding strap extending around outside of and contacting with said blades for holding said blades in place in interlocking engagement with said disks, said banding strap aligning said disks.

12. A rotor for a blower comprising a body portion having two stamped disks with outwardly divergent peripheral portions, a plurality of curved stamped blades passing through said disks, and a banding strap extending around outside of and contacting with said blades, said banding strap having its marginal edges contacting with the inner surfaces of the peripheral portions of the disks and binding thereagainst to align said disks, said rotor having means for holding said blades immovably locked with respect to said disks.

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