

BETTER MOUSE TRAPS: THE HISTORY OF THEIR DEVELOPMENT IN THE USA

DAVID C. DRUMMOND (Retired), UK Ministry of Agriculture, 22 Knoll Road, Dorking, Surrey RH4 3EP, England UK.

Abstract: Out of a total of 165 patented and manufactured mouse traps considered within the context of the USA Patent Office's classification system of animal traps, 7 'better mouse traps' are identified, described and illustrated. It is also revealed how only three of these better mouse traps gave rise to most of the very large number of differently named mouse traps that are currently available from a variety of manufacturers for use by both householders and pest control companies.

Key Words: history, house mouse, inventors, IPM, mouse traps, *Mus*, patents

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INTRODUCTION

House mice (*Mus spp.*) continue to provide a constant threat of damage to human health, food and property, not only in the home but also in commercial buildings, especially those concerned with the storage and preparation of food. Because of the difficulty of adequately proofing dwellings and business premises against the intrusion of small rodents and the dangers of using poisons when children and pets are present, traps often provide the only satisfactory means of mouse damage management. Their use also minimises the risk of disease and the smell from mice that might otherwise die in inaccessible places.

In the past, improvements in mouse trap design seem to have taken place rather gradually over many centuries and mainly in Europe (Drummond 1992). But, in the latter half of the 19th century, there was a marked increase in the rate of change and nowhere more so than in the USA. Indeed, a glance at the wide range of mouse traps currently available today from hardware stores, supermarkets and mail order firms, reveals that most had their origins in USA patents, some of which were registered as early as the late 19th century. A good way

start understanding their history is to look at USA Patents for mouse traps. Unfortunately, this is not practicable because many inventors did not specify which animals their patented inventions were intended to trap. Thus, we will begin by considering mouse traps against the background of animal trap patents generally.

ANIMAL TRAP PATENTS

With the exception of glue traps that will be dealt with later, we will now take a look at the distribution in type, number and date of those patents known to have resulted in manufactured mouse traps in comparison with animal traps as a whole. I have concentrated this initial review on those 19th and 20th century patents that fall within the USA Patent Class 43 and Subclasses 60 to 99.

There are 4,722 such patents and from these I have excluded 129 in which the patentees divulged that they were intended for one of a variety of creatures such as fish, snakes, frogs or crustaceans and were, therefore, unlikely to have been used as designs for mouse traps. Thus we are left with 4,593 patents, each of which

we can be fairly sure was intended for traps to capture mammals or birds or both. I have simplified the situation further by arranging the patent subclasses into six groups that seem to be the most appropriate for considering the history of mouse traps.

These groups are:-

1. Single-catch live traps – subclasses 60 to 63.
2. Multi-catch live traps – subclasses 64 to 74 and 76.
3. Snap traps – subclasses 81 to 83.
4. Choker traps – subclasses 85 to 87.
5. Jaw traps – subclasses 88 to 97.
6. Miscellaneous traps – subclasses 75, 77 to 80, 84, 98 and 99. These include crushing,

spearing, exploding and electrocuting traps.

We can now consider the numbers of patents in each of these groups that were used to construct commercially available mouse traps as a proportion of the total patents (Table 1). It is perhaps also worth noting at this point that a single manufactured trap is not always the outcome of a single patent. In fact, the total of 165 patents shown in the last column of Table 1 represent only 149 identifiable traps and it is more than probable that the patentees of these traps made use of ideas expressed in patents other than those recognised. Nevertheless, a useful picture is now beginning to emerge of the distribution of effort expended by trap inventors and the type of invention likely to be most useful for catching mice.

Table 1. Numbers of USA patents for manufactured mouse traps, by group and by year, shown as a proportion of total animal trap patents (see text).

Trap Group	Years								Totals
	1840-59	1860-79	1880-99	1900-19	1920-39	1940-59	1960-79	1980-99	
1.	0/3	2/62	1/49	4/104	0/151	2/92	2/41	19/97	30/599
2.	0/23	8/281	4/235	2/431	3/350	4/119	2/34	0/53	23/1526
3.	0/5	1/27	11/84	21/144	25/210	17/119	4/37	13/58	92/684
4.	0/0	4/35	2/38	3/88	0/83	1/49	1/23	4/43	15/359
5.	0/3	1/43	0/107	1/261	0/286	0/99	0/68	0/61	2/928
6.	1/7	0/34	0/89	0/159	0/79	1/65	0/46	1/18	3/497
Totals	1/41	16/482	18/602	31/1187	28/1159	25/543	9/249	36/340	65/4593

Groups 5 and 6 (jaw and miscellaneous traps) can be safely dismissed as not making a useful contribution to the history of mouse traps and we will not consider them further. In Groups 1 to 4 the activity of trap inventors

reached its peak during the first four decades of the 20th century and, thereafter, markedly declined. There has, however, been an interesting minor resurgence during the last twenty years in Groups 1

and 3 resulting in the production of new designs of single-catch live mouse traps and mouse snap traps.

We will now examine single-catch live, multi-catch live, snap and choker traps in more detail, paying particular attention to those traps that, by virtue of the numbers produced, the great length of time for which their production continued and the extent to which they were copied and disseminated by other manufacturers, can be considered as 'Better Mouse Traps'. That is to say, they were perceived to be better than others then available, not only by the intended users, but also by the copiers who greatly increased their availability. Such criteria by their very nature rule out recently designed and marketed mouse traps, but in the last part of this paper, I have attempted to identify those recent traps that for one reason or another seem to have the potential for becoming 'better'.

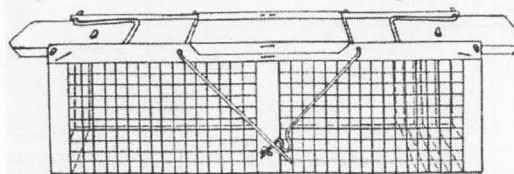
SINGLE-CATCH LIVE MOUSE TRAPS

Attempts to improve on the traditional simple single-catch live mouse box or cage trap with a bait hook at one end connected to a vertically-sliding or a swing door, falls roughly into two phases: first, a very long one of over 100 years lasting into the late 1970s, in which the trap remained a wooden box or wire cage or occasionally became a glass jar. The second period belongs to the throw-away society, where cheap plastic products predominated and where the apparent renewed interest of the consumer and the low cost of production resulted in no less than eighteen new marketed designs in some fifteen years. During these two periods most traps seem to have come and gone quite rapidly and only the small mouse-size Havahart has so far shown sufficient durability to be considered further as a better mouse trap.

Havahart

Rupert Merkl of Ossining, NY patented (1784904) a wooden box trap as early as 1930, but it was not until he redesigned it in metal with a modified door release mechanism that it became clearly recognisable as the origin of the Havahart trap. He applied for a patent on September 9, 1946 and it was approved on March 4, 1952. The patent was titled "Rodent Trap" and the inventor stated at the start that it was intended particularly to catch large and small animals such as mice, rats, squirrels and like animals. Thus, it came to be made in a variety of sizes, including a small one for mice (Figure 1), by its manufacturer, Allcock Manufacturing Company of Ossining, NY. Being galvanised and robust, the traps are particularly suitable for outdoor use. Their production was subsequently taken over by Woodstream Corporation of Lititz, PA, who bought the Havahart line from Allcock in 1979.

Figure 1. Havahart mouse trap, 1952.



MULTI-CATCH LIVE MOUSE TRAPS

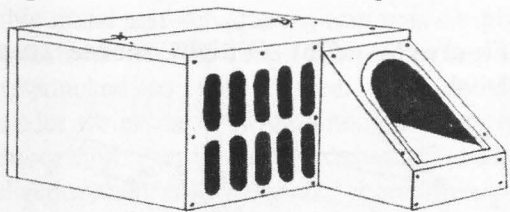
No doubt the challenge of trying to achieve the ideal trap, one that would continue to catch more and more animals without requiring the constant attention of the user, was the main factor that led to the very large number of patents (1,526) being granted for this group (group 2) of traps (Table 1). In addition the wide variety of ingenious mechanisms that inventors incorporated into such traps required the Patent Office to divide them into no less than twelve subclasses. These even included such complexities as revolving compartments and descending elevators to take trapped animals to lower assembly points. There can be little doubt that most

of such complicated arrangements were designed only for very small animals and it is perhaps not surprising that very few designs in this group were commercially produced and only the following three discussed under their respective names can be regarded as better mouse traps.

Delusion

John Morris of Seward, NE, patented (179940) the first design for this trap in 1876 and a year later his second patent (195632) revealed a number of modifications that led to its eventual commercial success (Drummond 1997a). His most important innovation was to design a door hinged so that it lay flat on the floor of the trap entrance and was flipped upwards to close the trap when the mouse stepped on the far end of a see-saw. The trap subsequently opened for its next victim when the mouse stepped off the see-saw and went through a one-way door into a holding compartment. The Delusion (Figure 2) was the first USA animal trap of any kind to have its name registered as a Trade Mark (No. 5116).

Figure 2. Delusion mouse trap, 1877.



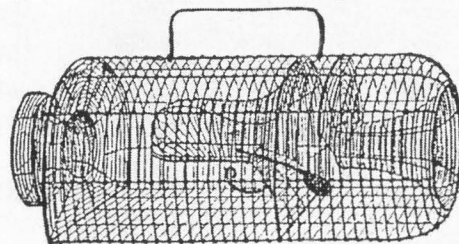
The trap was first made in John Morris's own Seward workshop, but with the need to find a manufacturer who could make sufficient to satisfy the demand, its production eventually went to the Lovell Manufacturing Company of Erie, PA. Lovell also produced a series of cheaper identical traps named Mascotte and Household. After the expiration of the patent the design was copied and produced as the Family by the Abingdon Trap Company and as the Catchemalive by the Animal Trap Company of Abingdon, IL and its successors of Lititz, PA. This

proliferation of copies and names of a particular trap is one of the hallmarks of a successful better mouse trap and a lasting tribute to its original inventor. We shall see it again as we identify other better mouse traps. Although more or less exact copies of John Morris's original design are no longer made, his ingenious flip-up door remains an important feature of Woodstream's Tin Cat and its later smaller plastic Mice Trap, as well as other recent live traps of competing manufacturers.

Marty

The wire cage trap (Figure 3) designed and manufactured by the Marty brothers, Henri and Edouard, in Villefranche de Rouergue in the French Department of Aveyron was patented in the USA by Henri in 1883 (290082) (Drummond 2003). Judging by the numerous advertisements for Marty rat and mouse traps in many Hardware Catalogs over the next two decades, they must have been imported from France in large numbers. Subsequently they were copied and made in different shapes and sizes by various companies and given a variety of names such as Hold 'em and Katch-all.

Figure 3. Marty mouse trap, 1883.

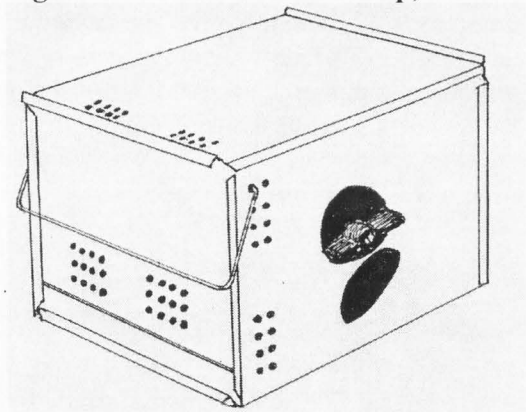


Today their manufacture and use in North America has been superseded by other multi-catch traps, but for catching rats Marty-type traps are still very much in evidence in many other parts of the world. This is especially so in third world countries where they can be made from wire and scrap metal without using any sophisticated technology.

Ketch-all

Austin "Brick" Kness worked as a custodian of the high school in Audubon, IA, and built the first of his wind-up multi-catch mousetraps in 1924 to protect the students' lunches from the local mice (Gooch 1999). As his design proved so successful he applied for a patent in 1927 and obtained it three years later (1758952). By this time he had already set up a company to manufacture the trap and after various minor modifications, the Ketch-all Automatic Mouse Trap (Figure 4) became for decades the leader in multi-catch mouse traps in the USA. It continues to be made by the Kness Manufacturing Company, Inc. of Albia, IA, mainly for commercial pest control purposes. The company has remained a family business for three generations and has recently produced a smaller model of the trap, the Mini-mouser, more appropriate for the domestic household.

Figure 4. Ketch All mouse trap, 1930.



SNAP TRAPS

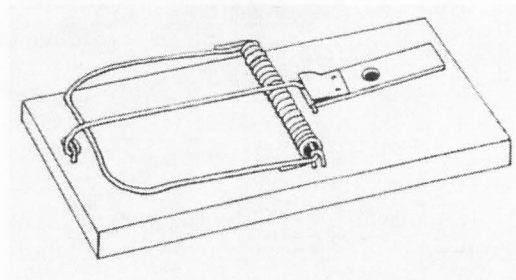
Snap traps are undoubtedly the most popular of all mouse traps in use in North America, a fact evidently recognised by inventors and manufacturers since a much higher proportion (over 10%) of the patents registered gave rise to commercially produced mouse traps compared to those of other groups (Table 1). Nevertheless comparatively few patented named snap traps survived for very long. Most of those that did survive

owe their survival to being part of a series of similar snap traps that were continually being partially reinvented, renamed and re-promoted by two major trap manufacturers, Woodstream and its predecessors of Lititz, PA and the McGill Metal Products Company of Marengo, IL. I have selected one series from each company for recognition as better mouse traps.

Out O'Sight series

The design for the Out O'Sight snap trap (Figure 5) was patented (528671) in 1894 by William C. Hooker of Abingdon, IL. His simple design arranged on a rectangular wooden base is undoubtedly one of the most significant developments in the history of mouse trap production and led to endless copies and modifications of his design throughout the world. One particular aspect of the design, that almost certainly was not immediately recognised at the time, was that the flat base provided the opportunity for printing on it a great variety of pictures and words to promote not only the trap itself, but often other products and services with which it was associated.

Figure 5. Out O'Sight mouse trap, 1894.



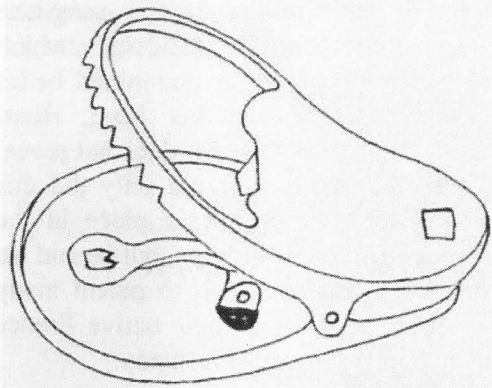
William Hooker set up a company in Abingdon to make the trap and later this merged with another company in Lititz, PA, where a great many variations on the basic design of the treadle took place successively over a long period of time, even up to the present day. These changes have been described in detail elsewhere (Drummond et al. 2002), but to

summarise, the patented ones included a double-pronged wire (Official), metal treadle with bait spike and notch (Victor 2-way), a more complex metal treadle (Victor 4-way) and most recently an expanded yellow plastic treadle, some with the appearance of a piece of cheese (Easy Set).

Alsteel Series

This series of snap traps at the start also owed much to Hooker's original design, but later went on to involve various changes concerned with all parts of the trap and are too complex to deal with in detail here. Suffice it to say that it began with William Stilson's patent of 1917 (1248944) for the self-set Good Mouse Trap made by the Stilson Specialty Company of Dubuque, IA. The final product had the treadle release mechanism of Herbert Stilson's 1932 patent (1891737) first used in the Better Mouse Trap made by the McGill Metal Products Company, and the metal shell and shape of Houtsinger's 1940 patent (22094420) with the final flourish of a metal flange added by Cain's 1955 patent (2724209). Up to and including this time the upper jaw of this metal self-set squeeze trap was simply inscribed 'McGill Trap'. Thereafter it was relaunched as the 'Alsteel' (Figure 6) under which name it remained particularly successful until its production was discontinued following the acquisition of McGill's trap department by Woodstream in 1992.

Figure 6. Alsteel mouse trap, 1955.



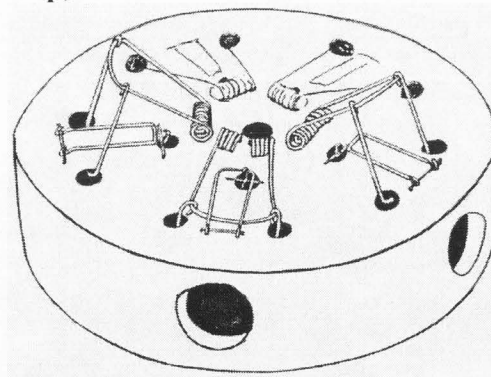
CHOKER MOUSE TRAPS

This group of mouse traps is the only one in which early traditional mechanisms seem to have been commonly used long after the introduction of later patented traps, as indicated by their continued ready availability as antiques. But interestingly, although their mechanism was of European origin (Drummond 1997b), the unusual round shape of the body of many of the traps, compared to the rectangular shape of European choker mouse traps, was confined to the USA and almost certainly began in Connecticut (Drummond 2002). The most important and enduring improvement to the traditional choker was that of John Bunnell.

Easy Setting Choker

John N. Bunnell, a mouse trap manufacturer of Unionville, CT, patented an improvement to the choker mouse trap design in November 1870 (108876). All he did was to replace the single wire that held down the noose with a wire loop, thereby making the trap very much easier to set (Figure 7). This improved design was later marketed with a standard four holes as the 'Easy Setting Choker' by the Lovell Manufacturing Company of Erie, PA and later still by Woodstream in black plastic that was named the 'Black Cat'. This last line of this kind of USA choker mouse traps was discontinued in 1990.

Figure 7. Easy Setting Choker mouse trap, 1870.



MOUSE GLUE TRAPS

I have left this group of mouse traps to the end because discovering their history has, for a number of reasons, required a rather different approach from that used for the other groups. Perhaps most importantly, early examples of used glue traps, or even unused ones, are not amongst the most treasured possessions of dedicated trap collectors. Also, although provision is made in Class 424 to cover any patents concerned with the composition of the glue for glue traps, manufacturers have preferred not to reveal their secret formulae to potential competitors. Some 15 patents in Class 43 Subclass 58 have, however, been registered for the types of structures housing the glue, although even for these items manufacturers seem surprisingly loath to reveal patent numbers on their products. Thus, for the most part, I have relied on advertisements in the trade journal *Pest Control* to unravel the development in the USA of glue traps or glue boards as they are often called.

In Europe, the use of glue for trapping mice is of long standing, though it has never played more than a very minor role. In contrast, in the USA since the 1950s, there has been a very considerable increase of interest in its use with the result that the glue traps of a number of manufacturers are now readily available alongside other mouse traps. For the first two decades, the glue only was provided for the user to spread out on their own choice of material and was primarily used by professional pest control operators. Thereafter, manufacturers provided the glue already spread on card or plastic and often in such a way that the user could readily fold a cover over the glue to protect it from any dust or damage before it had served its proper function. Following this change, glue traps were marketed to and well accepted by the general public.

In the absence of any good evidence about which glue or which mode

of presentation is better than another, I have not attempted to identify a better glue trap.

SOME FURTHER THOUGHTS

Having identified what I consider to have been or still are better mouse traps, I will try in this last section to provide some thoughts on the most important factors that seem to have determined their survival and those that sometimes have occasioned their demise.

Inventors

Good inventors are by nature problem solvers, whether they are inventing mouse traps, or any other useful item. If we look at the names of all the 120 inventors that patented traps in the USA that were produced as mouse traps we find that 97 of them only patented a single mouse trap. It seems likely that most of these inventors were discouraged by their lack of success and did not get involved with other patents, but this was not always the case. We may suppose, for example, that James Keep who patented a number of toys and domestic items had other things on his mind than monetary reward when he designed his Royal No 1, decorated it with two hearts and assigned the patent to his wife, Joanna (Drummond 2001). Frederick Egge was another industrious inventor and patentee who seems not to have been particularly concerned with the commercial potential of mouse traps. His company of Smith and Egge of Bridgeport, CT, discontinued making his own patented Rapid Transit Mouse Trap after only one or two years after using it to replace John Morris's *Delusion*, which was later to become an undoubted better mouse trap. On the other hand, Henri Marty's single USA patent does not reveal any lack of interest for not only did this single patent secure him a place in the history of USA mouse traps, but he and his brother Edouard went on to patent many other trap designs in their native France and also in Britain and Germany.

Turning now to those inventors with more than one mouse trap patent to their name, it is perhaps not surprising to discover that those with the most, John Morris, William Hooker and the Stilson brothers, also figure as inventors of better mouse traps. But what is surprising is that each of these inventors has produced only one that seems to have been an outstanding success. Clearly inventors do not know for sure that they have designed a winner until its potential value has been recognised by both manufacturers and users following its success in the market place.

Manufacturers

Our two earliest inventors of better mouse traps, John Bunnell and John Morris, were unusual in already being mouse trap makers when they registered their patents. Even so, neither had the resources nor the distribution network to really take advantage of their inventions. Thus, it was not until the early 1880s when the production of both traps was taken up by the Lovell Manufacturing Co. of Erie, PA that their commercial success was assured. Morris's trap retained its name of Delusion and Bunnell's unnamed choker was provided with the appropriate name of Easy Setting Choker. Rupert Merkl sensibly followed their example and had his Havahart traps made by the Allcock Manufacturing Company in his home town of Ossining, NY. The Stilson brothers made various attempts to set up their own factories in several locations, including Dubuque, IA, West Orange, NJ and Morrison and Harvard, IL but all the resulting factories were short lived and eventually they arranged for all their later

trap patents to be made by the McGill Metal Products Company of Marengo, IL.

In contrast, the Marty brothers, William Hooker and Austin Kness were all successful in setting up their own trap factories to manufacture their own trap designs. After three generations, the Marty family business has recently had to close. William Hooker's Animal Trap Company of Abingdon benefited from joining up with the John Mast Company in Lititz, PA. There then followed a series of changes of owners and names, the company finally being renamed Woodstream, a title it still holds today. During its period in Lititz, the company has continued to grow, partly by diversifying but also partly by buying the trap making departments of its competitors Lovell (1940s), Allcock (1970s) and McGill (1990s), purchases that resulted in the demise of many traps, including the McGill Alsteel, but the retention of others such as the Havahart. Kness, on the other hand, has remained a successful family business relying on its reputation in the field of wind up mouse traps.

This brief summary of the fortunes of the initial manufacturers of better mouse traps suggests a trend towards fewer and fewer makers of such traps. In fact, this is far from the case and completely overlooks the ability and desire of other manufacturers to produce relatively simple items that have long since ceased to be protected by patents. We have only to look at the large range of mouse traps available today from a number of producers (Table 2) to recognise that there has been a substantial change, much of which has taken place in the last one or two decades.

Table 2. Some USA mouse traps available in 2002.

Trap Type	Manufacturer	Trap Name
Single-catch live	Woodstream	Havahart, Live catch
	Kness	Tip Trap
	DWL Brand	Valve
	Mouse Depot	Mouse Depot
Multi-catch live	Woodstream	Tin Cat, Mice Trap, Poly Cat
Not wind-up (derived from Delusion)	Bell Labs	Trapper 24/7
	J.T.Eaton	Repeater
Multi-catch live	Kness	Proketch
	Kness	Ketch-All, Mini-Mouser
Wind-up (derived from Ketch-All)	Woodstream	Multi Cat
	Bell Labs	Protector MC
	J.T.Eaton	Wind-up
	Micro Gen	Mouse Master
	Gremer	Kwik Katch
M-c live other	Motomco	Tom Cat
	Maine Mouse-ah	Maine Mouse-ah
Snap – flat (derived from Out O'Sight)	Woodstream	Victor, Easy Set, Professional
	Atlantic Paste	Catchmaster
	J.T.Eaton	JTEaton, Good-Bye, Expanded Trigger
	Howard Berger	Mouse Guard
	Roxide Int.	Revenge
	Faucet Queens	Helping Hand
	Intruder Inc.	Intruder
	PIC Corp.	PiC
	Mouse Trap Co.	Clean Catch
	d-Con Co.	d-Con
Snap – other	Woodstream	Quick Set, Quick Kill
	Kness	Snap-E
	d-Con Co.	d-Con
	Bell Labs	Trapper, Tom Cat
	Intruder Inc.	The Better
Choker	Woodstream	No See
Glue	Atlantic Paste	Catchmaster
	Woodstream	Victor
	J.T.Eaton	Stick-em
	d-Con Co.	d-Con
	Kness	Stick-All
	DWL Brand	Coffin
Other	Bell Labs	Trapper
	Woodstream	Rat Zapper

Quite apart from the continuing natural desire of other manufacturers to

participate in the profits to be made from pest control, there seem to have been three

major factors that have produced the present recent changes. Firstly, it has been possible for companies to arrange for cheap replicas of better mouse traps to be made overseas in such places as China and Taiwan. Secondly, the idea of integrated pest management (IPM) has been embraced whole heartedly by the pest control industry with the consequent result that the producers and suppliers of pest control products have diversified to try to provide everything that a pest control operator and the general public might need. In the field of rodent control this means that a trap manufacturer of a particular type of trap not only starts to produce other sorts of traps, but also expands into rodenticide baits and animal repellents. Thirdly, the resurgence of single-catch live mouse traps can be attributed to the concern of a growing segment of the human population for the humane treatment of animals, including pests. There is a misguided belief held by many that it is humane to relocate and release a captured mouse into the out-of-doors in a place unfamiliar to the animal. It seems that as the human population becomes more urbanized and loses all direct connection to rural living an understanding of the harsh reality of survival of animals in the wild is lost.

Finally, we should mention that while most mouse traps listed in Table 2 are what we have already designated as better, some of the other more recently patented ones may become so, especially as they are now being produced by major manufacturers. My own choice as potential winners would be Woodstream's Live Catch and Quick Kill and Kness's Tip Trap and Snap-E, but only time and users will tell.

Users

As we have already noted, the choice available to the user can be limited by the manufacturer by ending certain

production lines, even sometimes of what appear to be those of better mouse traps. But there can be little doubt that all the better mouse traps and all their numerous copies that survive today are the result of user preference, whether they are the large multi-catch traps preferred by the pest control industry or flat snap traps preferred for household use. I suspect that neither type of user can decide which is the best of all the better mouse traps now available, and their own expertise in using the trap will play a much more important role in solving their mouse problems than the actual make of trap chosen.

ACKNOWLEDGMENTS

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